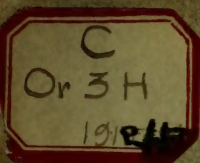


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OREGON AGRICULTURAL COLLEGE CATALOGUE

for

1913-1914

With List of Students for 1912-1913

CORVALLIS, OREGON

CATALOGUE

OF THE

Oregon Agricultural College

FOR

1913-1914

With List of Students for 1912-1913

CORVALLIS, OREGON

May, 1913

CALENDAR, 1913

JULY							AUGUST							SEPTEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
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						31														
OCTOBER							NOVEMBER							DECEMBER						
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							30													

CALENDAR, 1914.

JANUARY							FEBRUARY							MARCH						
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APRIL							MAY							JUNE							
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19	20	21	22	23	24	25	17	18	19	20	21	22	23	21	22	23	24	25	26	27	
26	27	28	29	30			24	25	26	27	28	29	30	28	29	30					
							31														

COLLEGE CALENDAR—1913-1914

1913.

July 9, Wednesday—Annual meeting of Board of Regents.
September 19, 20, 22, Friday, Saturday, Monday—Registration and examinations for admission.
September 23, Tuesday—Recitations begin.
November 26, 27, 28, 29, Wednesday (noon), Thursday, Friday, Saturday—Thanksgiving recess.
December 8-13, Monday-Saturday—Farmers' Week.
December 20, Saturday (noon)—Christmas recess begins.

1914.

January 5, Monday—Regular exercises resumed.
January 5, Monday—Winter short courses begin.
January 7, Wednesday—Semi-annual meeting of Board of Regents.
February 2, 3, 4, 5, Monday, Tuesday, Wednesday, Thursday—First semester examinations.
February 5, Thursday—First semester ends.
January 31, Saturday—Winter short courses end.
February 10, Tuesday—Second semester begins.
April 8, Wednesday—Meeting of Board of Regents.
May—Military Inspection.
May—Senior Rhododendron Excursion.
May 30, Saturday—Decoration Day; legal holiday.
June 1, 2, 3, 4, 5, Monday, Tuesday, Wednesday, Thursday, Friday—Second semester examinations.
June 7, Sunday—Baccalaureate Exercises.
June 8, Monday—Alumni and Graduating Class Exercises.
June 9, Tuesday—Commencement Exercises.
June 15, Monday—Summer School begins.

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OREGON AGRICULTURAL COLLEGE
and

Experiment Station

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HON. E. E. WILSON, Secretary	Corvallis
HON. B. F. IRVINE, Treasurer	Portland

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HON. BEN W. OLCOTT, Secretary of State	Salem
HON. J. A. CHURCHILL, Supt. of Public Instruction.....	Salem
HON. CHARLES E. SPENCE, Master of State Grange, Oregon City	

APPOINTED BY THE GOVERNOR

	Term Expires.
MRS. CLARA H. WALDO	Portland, 1915
HON. E. E. WILSON	Corvallis, 1915
HON. B. F. IRVINE	Portland, 1915
HON. J. T. APPERSON	Parkplace, 1918
HON. J. K. WEATHERFORD	Albany, 1918
HON. C. L. HAWLEY	McCoy, 1918
HON. WALTER M. PIERCE	La Grande, 1921
HON. H. VON DER HELLEN	Wellen, 1921
HON. GEO. M. CORNWALL	Portland, 1921

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of the

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C. E. Spence, W. M. Pierce.

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COLLEGE COMMITTEE

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STATION COMMITTEE

W. M. Pierce, Chairman; Geo. M. Cornwall, H. Von der Hellen.

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FORESTRY

Geo. M. Cornwall, Chairman; Oswald West, C. L. Hawley.

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(Arranged in groups in the order of seniority of appointment)

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Director of the Agricultural Experiment Station.

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Dean of the School of Engineering and Mechanic Arts.
Professor of Mechanical Engineering.

JOHN ANDREW BEXELL, A. M.,
Dean of the School of Commerce.
Professor of Business Administration.

EDWIN DEVORE RESSLER, A. M.,
Director of the Summer School.
Professor of Industrial Pedagogy.

ANNA ZOU CRAYNE, A. B., M. D.,
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HENRIETTA WILLARD CALVIN, S. B.,
Dean of the School of Domestic Science and Art.
Professor of Domestic Science.

RALPH DORN HETZEL, A. B., LL. B.,
Director of Extension Service.

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Professor of History.

GORDON VERNON SKELTON, C. E.,
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JOHN FULTON, M. S.,
Professor of General and Analytical Chemistry.

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Professor of Commercial Law.

CLAUDE ISAAC LEWIS, M. S. A.,
Professor of Horticulture.

CHARLES LESLIE JOHNSON, B. S.,
Professor of Mathematics.

CLARENCE MELVILLE MCKELLIPS, Ph. C.,
Professor of Pharmacy.

JAMES DRYDEN,
Professor of Poultry Husbandry.

HENRY DESBOROUGH SCUDDER, B. S.,
Professor of Agronomy.

HENRY MARTIN PARKS, B. S., E. M.,
Professor of Mining Engineering.

WILLIAM FREDERIC GASKINS, B. S.,
Professor of Music.

*On leave of absence.

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Secretary to the President.

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Professor of Physics.

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Professor of Botany and Plant Pathology.

LOUIS BACH, M. A.,

Professor of Modern Languages.

CLARENCE A. DOBELL,

Manager Business Office.

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Librarian.

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THEODORE DAY BECKWITH, M. S.,

Professor of Bacteriology.

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Professor of Electrical Engineering.

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Professor of Physical Education for Men.

MIRIAM THAYER, A. B.,
Professor of Physical Education for Women.

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Commandant of Cadets.
Professor of Military Science and Tactics.

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Professor of Political Economy.

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Professor of Political Science.

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Associate Professor of Mechanical Engineering.

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Associate Professor of Landscape Gardening and Floriculture.

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Associate Professor of Mining Engineering.

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Assistant Professor of Technical Woodwork.

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Assistant Professor of Domestic Science and Art.
Extension Service.

.....
Assistant Professor of Civil Engineering.

.....
Assistant Professor of Veterinary Science.

WALTER S. BROWN, B. A., B. S.,
Assistant Professor of Horticulture.
Extension Service.

FACULTY

(The members of the Administrative and College Councils are also members of the Faculty.)

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Instructor in Mathematics.

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Instructor in Forging.

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Instructor in Voice.

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Instructor in Dairy Husbandry.

GERTRUDE EWING McELFRESH, A. B.,
Instructor in English.

ALICE LEORA EDWARDS, B. S.,
Instructor in Zoology.

JAMES GEORGE ARBUTHNOT, B. S.,
Instructor in Physical Education.

MAY BABBITT-RESSLER,
Instructor in Piano.

*On leave of absence.

FLORENCE BOWDEN,
Instructor in English and Music.

GEORGE ROY SAMSON, B. S., A. B.,
Instructor in Animal Husbandry.

EDITH CARTER KUNEY, A. B.,
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Library Cataloguer.

JOHN MONTGOMERY SPEIDEL, B. S.,
Instructor in Horticulture.

AMBROSE ELLIOTT RIDENOUR, B. S.,
Instructor in Foundry Practice.

EDGAR PERKINS WALLS, M. S.,
Instructor in Botany.

*On leave of absence.

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CHARLES E. OWENS,
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ERWIN BERTRAN LEMON, B. S.,
Instructor in Commerce.

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Instructor in Chemistry.

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Orchard Foreman.
Instructor in Horticulture.

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Instructor in Domestic Science.

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Instructor in Civil Engineering.

QUEEN INEZ JOHNSON,
Instructor in Music.

HILDA MILLER, B. S.,
Instructor in Chemistry.

*On leave of absence.

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Instructor in Domestic Science.

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Instructor in Physical Education for Women.

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Cataloguer in Library.

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Instructor in English.

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Instructor in Animal Husbandry.

WINIFRED M. ATWOOD, M. S.,
Instructor in Botany and Plant Pathology.

.....
Instructor in Pharmacy.

.....
Instructor in Bacteriology.

.....
Instructor in Physical Education for Men.

.....
Instructor in General Chemistry.

R. ADAMS DUTCHER, M. S., A. M.,
Instructor in Agricultural Chemistry.

RACHAEL WEBB HAIGHT,
Assistant in Library.

BERTHA HERSE, B. S.,
Assistant in Library.

GODFREY VERNON COPSON, M. S.,*
Assistant in Bacteriology.

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Assistant in Military Science.

DOROTHY KEATLEY, B. S.,
Assistant in Domestic Art.

ROY E. MARSHALL, B. S.,
Assistant in Horticulture.

LYNN E. CRONEMILLER,
Student Assistant in Forestry.

OTHER OFFICERS

ESTHER VESTAL LEECH, B. S.,
Preceptress of Women's Dormitory.

PAUL MEREDITH COLLINS, A. B.,
Secretary of Extension Service.

SIBYLLA HADWEN,
Housekeeper, Women's Dormitory.

DAVID MASTERTON,
Foreman Campus and Greenhouses.

GEORGE B. KEADY,
Foreman Printing Plant.

JOHN H. EDWARDS,
ELLSWORTH ERWIN,
Head Janitors.

*On leave of absence.

STAFF OF AGRICULTURAL EXPERIMENT STATION

WILLIAM JASPER KERR, D. Sc.,
President.

JAMES WITHYCOMBE, M. Agr.,
Director.

CLAUDE ISAAC LEWIS, M. S. A.,
Horticulturist.

JAMES DRYDEN,
Poultry Husbandman.

HENRY DESBOROUGH SCUDDER, B. S.,
Agronomist.

HERBERT SPENCER JACKSON, A. B.,
Botanist and Plant Pathologist.

THEODORE DAY BECKWITH, M. S.,
Bacteriologist.

ERMINE L. POTTER, B. S.,
Animal Husbandman.

HERMAN VANCE TARTAR, B. S.,
Chemist.

HAILEY FROST WILSON, M. S.,
Entomologist.

ROY R. GRAVES, M. S.,
Dairy Husbandman.

VICTOR RAY GARDNER, M. S.
Pomologist.

GEORGE ROBERT HYSLOP, B. Sc.,
Assistant Agronomist.

ARTHUR GEORGE BOUQUET, B. S.,
Olericulturist.

EDWARD JACOB KRAUS, B. S.,
Research Associate in Horticulture.

VICTOR I. SAFRO, B. S. A.,
Research Assistant in Entomology.

WILBUR LOUIS POWERS, M. S.,
Assistant Agronomist.

HOWARD P. BARSS, A. B., S. M.,
Research Assistant in Plant Pathology.

MERRIS M. McCOOL, Ph. D.,
Assistant Agronomist.

BERT PILKINGTON, B. S.,
Research Assistant in Chemistry.

FRANK ROSS BROWN, B. S.,
Research Assistant in Horticulture.

LYMAN BUNDY, B. S.,
Research Assistant in Chemistry.

FLOYD DOUGLAS BAILEY, M. S.,
Research Assistant in Plant Pathology.

FREDERICK CHARLES BRADFORD, M. S.,
Research Assistant in Horticulture.

HENRY ELLSWORTH EWING, Ph. D.,
Research Assistant in Entomology.

A. LESTER LOVETT, B. S.,
Research Assistant in Entomology.

ALONZO F. VASS, M. S.,
Research Assistant in Bacteriology.

REGINALD H. ROBINSON, A. B.,
Research Assistant in Chemistry.

ALFRED FRED JOHN LAFKY, B. S.,
Orchard Foreman.

GEORGE ROY SAMSON, A. B., B. S.,
Assistant Animal Husbandman.

O. M. NELSON, B. S.,
Assistant Animal Husbandman.

GLANCY S. RALSTON, B. S.,
Research Assistant in Horticulture.

CHARLES EUGENE ROBINSON,
Foreman Stock Farm.

CHARLES CHAUNCY LAMB,
Foreman Poultry Plant.

HELEN LUCILE HOLGATE, B. S.,
Station Clerk.

UNION BRANCH EXPERIMENT STATION

ROBERT WITHYCOMBE, B. S.,
Superintendent.

UMATILLA BRANCH EXPERIMENT STATION

RALPH WILMER ALLEN, B. S.,
Superintendent.

SHERMAN COUNTY DRY-FARM BRANCH EXPERIMENT
STATION

D. E. STEPHENS, B. S.,
Superintendent.

SOUTHERN OREGON BRANCH EXPERIMENT STATION

F. C. REIMER, M. S.,
Superintendent.

HARNEY VALLEY BRANCH EXPERIMENT STATION

LEROY BREITHAUP, B. S.,
Superintendent.

HOOD RIVER COUNTY BRANCH EXPERIMENT STATION

C. C. STARRING,
Horticulturist.

.....
Plant Pathologist.

—————
STANDING COMMITTEES

(The President of the College is ex-officio a member of all standing committees.)

1. **Entrance Examinations**—Professors Tartar, McLouth, Mr. Baldwin.
2. **Scholarship and Graduation**—Professors Berchtold, Skelton, Weniger, Hillebrand, Mr. Tennant.
3. **Graduate Students and Advanced Degrees.**—Professors Skelton, Cordley, Ressler, Weniger.
4. **Credentials, Advanced Standing, and Substitutions**—Professors Ressler, Berchtold, Johnson, Mr. Tennant.
5. **Schedules**—Professors Johnson, Beaty.
6. **Student Affairs**—Professors Peavy, Beckwith, Reed, Thayer, Mr. Peterson.
7. **Student Domiciles**—Professor Horner, Dean Crayne, Professor Beckwith, Mr. Simpson.
8. **Athletics**—Professors Stewart, Cordley, Peavy, Mr. C. A. Dobell, Mr. Pilkington, Mr. Dolan.

Oregon Agricultural College

GENERAL INFORMATION

FOUNDATION AND ENDOWMENT

In pursuance of an Act of Congress, approved by President Lincoln, July 2, 1862, a grant of land was made to each State in the Union to the amount of thirty thousand acres, or its equivalent, for each Senator and Representative in Congress to which the State was entitled by the apportionment of the census of 1860. The proceeds under this Act were to constitute a perpetual fund, the principal of which was to remain forever undiminished; but the interest arising from said fund was to be inviolably applied by each State that should avail itself of the benefits of the Act, to the support and maintenance of a "College where the leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." Ninety thousand acres of land were apportioned to Oregon, and by an Act approved October 9, 1862, the Legislative Assembly of Oregon accepted the provisions of the congressional law.

THE LAND GRANT FUND. The subsequent sale of this land has netted the College approximately \$200,000. This at present is

invested in securities bearing six per cent interest. The Act of Congress of 1862 explicitly states that no part of the funds so appropriated, or the interest arising therefrom, shall be used for the purchase, erection, or maintenance of any building or buildings.

THE HATCH FUND. Under an Act of Congress, approved March 2, 1887, the College receives \$15,000 a year for the maintenance of an Agricultural Experiment Station, "to aid in acquiring and diffusing among the people useful and practical information on subjects connected with agriculture."

THE MORRILL FUND. On August 30, 1890, an Act was passed by Congress "to apply a portion of the proceeds of the public lands to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under the provisions of the Act of 1862." This Act provided that in 1890, \$15,000 should be paid to each of the land grant colleges, and that the amount so appropriated should be increased by the sum of \$1,000 annually for ten years, and that thereafter the amount annually appropriated should continue to be \$25,000. Under an Act of Congress, approved March 4, 1907, known as the Nelson Amendment, this fund is increased by the sum of \$5,000 for the first fiscal year ending June 30, 1908, and by an additional \$5,000 for each succeeding year until the total annual amount is \$50,000.

THE ADAMS FUND. An Act of Congress, approved March 20, 1906, appropriated an initial \$5,000 for that year, and \$2,000 additional for each year thereafter until the annual amount should reach \$15,000. This fund is "to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry" of the State, and therefore supplements the Hatch Fund in the maintenance of the Experiment Station.

In addition to the income which it derives from the National Government, the College is dependent upon the State Legislature for such appropriations as are required for the maintenance and development of the institution, in accordance with the provisions of the Acts of Congress, and in response to the industrial and educational demands of the State.

HISTORY

As there were no State colleges in Oregon in 1868, the Legislature of that year, which provided for the location of the land received under the Act of 1862, gave the interest on the funds derived from the sale of the land to the Corvallis College, a private institution in Benton County, which was then under the control of the Methodist Episcopal Church, South. For a number of years, none of the land granted was sold, and the Legislature made small annual appropriations for the support of the school.

In 1885, the church voluntarily relinquished its claim on the funds of the college and the State assumed entire control of the institution. The Legislature of that year provided for the "permanent location of the State Agricultural College at Corvallis, in Benton County," on condition that the citizens of said county should, within four years, erect on the "farm containing thirty-five acres in the immediate vicinity of said city, known as the Agricultural College Farm, brick buildings for the accommodation of said State Agricultural College at a cost of not less than \$20,000." During the summer of 1887, the corner stone of the building erected by the citizens of Benton County was laid by the Governor of Oregon, amid imposing ceremonies.

This structure, now known as the Administration Building, was the nucleus around which other buildings soon began to cluster as necessity and growing interest demanded. For a year or two there was ample room; but, as the institution grew, more land was needed and provided, and instead of thirty-five acres originally comprising campus and grounds, the institution now owns three hundred and forty acres; and instead of one structure, there are now thirty. There has also been an increase in the attendance from ninety-seven to upwards of two thousand students. Twenty years ago, most of the students came from Benton and neighboring counties. Now, every county in Oregon, thirty-seven other states, and ten foreign countries are represented. The increase in the number of students, called for an increase in the number of the faculty. This body, from the number of five in 1884, has grown until it now closely approaches the seven-score mark. Other

features usually found in connection with progressive educational institutions have grown in equal ratio. The courses have been strengthened, the standard has been advanced, and other improvements have been made from time to time, which have added to the thoroughness and efficiency of the work.

GOVERNMENT

The general government of the College is vested primarily in the Board of Regents, and, under their control, in four other administrative bodies—the Administrative Council, the College Council, the Faculty, and the Experiment Station Staff. These bodies, in the exercise of their respective duties, determine the questions of policy and regulate all matters relating to the interests of the institution.

THE BOARD OF REGENTS consists of thirteen members, of whom the Governor, the Secretary of State, the Superintendent of Public Instruction, and the Master of the State Grange, are ex-officio members. The other nine members are appointed by the Governor with the approval of the State Senate, and hold office for a term of nine years. Under a law of the State Legislature, passed in 1885, the Board of Regents constitutes a body corporate, under the name of "The Board of Regents of the State Agricultural College, * * * with power to sue and be sued, and to make contracts," and to enact such regulations as may be necessary for the maintenance and development of the College.

THE ADMINISTRATIVE COUNCIL consists of the President of the College, the Director of the Experiment Station, the Deans of the different Schools, the Director of the Summer School, the Dean of Women, and the Director of Extension. The function of this Council is to consider and determine the larger questions of policy and administration.

THE COLLEGE COUNCIL is composed of the President of the College and all officers of administration and instruction with the rank of professor, associate professor, or assistant professor. This body considers all general questions relating to the educational work and policy of the College; arranges and correlates the courses of study, and determines the requirements for admission and

graduation. The different committees of the College Council, representing the several schools of instruction, have charge of the enrollment and progress of students in the respective schools, and investigate the records of all candidates for graduation.

THE COLLEGE FACULTY comprises members of the College Council and all other instructors and members of the Experiment Station Staff. It considers routine questions of method and discipline, for which it is particularly well adapted, being in close contact with all that pertains to student interests and student life.

THE EXPERIMENT STATION STAFF includes the President of the College, the Director of the Experiment Station, the heads of the various departments of the School of Agriculture and all assistants, engaged in research and experimental work. The members of this staff are engaged in the investigation of problems encountered in the development of the agricultural interests of the State. They also distribute information regarding their investigations by means of correspondence, circulars and station bulletins.

THE STUDENTS. The College does not undertake to prescribe in detail either its requirements or prohibitions. Students are met on a plane of mutual regard and helpfulness. Since the advantages of the institution are provided at public expense, the students are under special obligation to perform faithfully all their duties, not only to the College, but also to the State and to the community. Whenever the deportment of any student is such that his influence is inimical to the interests of the institution, he will be relieved from further attendance.

PURPOSE AND SCOPE

The purpose of the College is to provide, in accordance with the Acts of Congress under which it is maintained, a liberal, thorough, and practical education,—an education that will afford the training required for efficient service in different branches of industry. The distinctive technical work covers the three great fields of production, manufacture, and commerce. Special attention is given to the application of science. All the practical work in the laboratories, in the shops, in the orchards, and on the farm, is

based on scientific principles. While the industrial or technical work is emphasized, the importance of a thorough general training, of mind development, and culture, is recognized in all of the work throughout the institution. The object is to meet the demand for a broad and general education, supplemented by special technical training.

The work, therefore, covers a broad field, including technical courses along the different lines of agriculture and forestry, commerce, pharmacy, engineering, and household technology; with the necessary training in the basic subjects of mathematics and the natural and physical sciences; and also the general training in language, literature, history, and civics, which constitutes an essential part of a liberal education.

In all the work of the institution, the object is to train the mind, the eye, and the hand to act in unison; to unfold and co-ordinate the faculties of mind and body; to develop a symmetrical manhood and womanhood, and a just appreciation of clean, upright citizenship.

LOCATION

The seat of the Oregon Agricultural College is Corvallis, a city of over five thousand inhabitants, situated at the head of navigation on the Willamette River. As the name implies, it is in the heart of the far-famed Willamette Valley. It is readily accessible by railway from all parts of the State; it has free mail delivery; there are many churches, and no saloons, and the moral tone is equal to that of any city within the boundaries of the State. It is a city of homes, and its people are justly proud of the great institution in the midst of them, and jealously guard its good name.

Situated on high, well-drained land, open to the invigorating sea-breeze, Corvallis is one of the most healthful cities in the State. It has never been visited by any dangerous epidemic disease, and the possibilities of such visitation in the future appear remote, for the city has a complete modern sewerage system and first-class gravity water system, supplied from springs high up the slope of Mary's Peak, the tallest mountain in the Coast Range, some fifteen miles away to the west. The city and its environs are conducive

to wholesome student and home life. It has an ample supply of pure mountain water for all domestic and sanitary purposes. The atmosphere is purified and the climate ameliorated by almost constant ocean breezes—warm in winter and cool in summer. The surrounding landscape elicits praise from all who behold its delightful charms as viewed in the extensive area of fertile fields, gardens and orchards. The wooded glens of the near-by foothills, and the rippling mountain brooks, or the more pretentious streams frequented by canoe, yacht, and launch parties, are fruitful sources of recreation; while the magnificent distant views to the east, where the fir-clad Cascade Mountains, with their wealth of trees and the perennially snow-capped sentinels—Hood, Jefferson, and the Three Sisters—present a constant panorama of picturesque mountain scenery. With such an environment, the city is truly an ideal location for a college and a home.

GROUNDS AND BUILDINGS

THE COLLEGE GROUNDS comprise three hundred and forty acres. That part of the grounds, forty-five acres in extent, lying immediately about the several buildings and usually designated as the lawns and campus, is tastefully planted with both native and exotic ornamental trees, shrubs, and herbs. The one hundred and eighty acres used for the farm, garden, and orchard operations is so platted and planted as to meet the demands of the various lines of work and still conform to a general scheme of landscape embellishment. This portion occupies a slightly elevated and gently undulating site wholly within the western limits of the City of Corvallis. In addition to the above plot, one hundred and fifteen acres, comprising the College stock farm, recently acquired, lies just south of the city limits. Broad drives and walks traverse the campus in all directions, thus rendering every objective point easily accessible. The numerous magnificent specimen trees, groups of shrubbery, and massed borders are a source of enjoyment as well as of instruction to all those who frequent the grounds. The scheme of planting has been such as to give an air of peaceful activity, orderly effort, earnest purpose, and quiet refinement. Daily association with such scenes, for a period of years, during the time

when men and women are forming the habits of thought and action that will be theirs through life, is certain to have a deep-seated and subtle influence for good in moulding the character of future citizens.

The following brief descriptions will convey a general idea as to the principal buildings and the purposes for which they are used:

THE ADMINISTRATION BUILDING is a three-story brick structure 90x120 feet, containing nine recitation rooms, the library, the offices of the President, the Registrar, and the Business Manager. Centrally located and on a slight eminence, it commands an unsurpassed view of the campus, the city of Corvallis, the Willamette River, and the picturesque Cascades.

SCIENCE HALL, situated southeast of the Administration Building, and constructed of gray granite and sandstone, covers a ground space of 85x125 feet, has three stories and basement, and contains twenty-nine rooms. It is one of the most substantial buildings on the ground, and within it, at present, are the Forestry, Pharmacy, and Chemical Departments, with their various laboratories, recitation rooms and lecture halls, together with the offices and laboratories of the experiment station chemist.

AGRICULTURAL HALL, standing southwest of the Administration Building, is the largest structure on the campus. It is an imposing edifice of brick and sand stone and consists of the central or Administrative Building, the north or Agronomy wing, and the south or Horticultural wing.

The central or Administrative Building is 66x140 feet, four stories and basement, and contains a total of forty-two conveniently arranged and well-lighted class rooms, laboratories and offices. Upon the first floor are the offices of the Director of the Experiment Station, the Dean of the School of Agriculture, the Professor of Poultry Husbandry, the Director of Extension Work, the mailing rooms, and the Agricultural library. The second floor is occupied by the department of Industrial Pedagogy, the offices of the Dean of the School of Domestic Science and Art, and of the Professor of Animal Husbandry; the third floor, by the department of Zoology and Entomology; and the fourth floor, by the departments of Bacteriology and Art, together with the general museums.

The north or Agronomy wing is 72x130 feet, and three stories high. It faces north and east, commanding splendid views of the valley and the College grounds. It is thoroughly modern in all its equipments, and while intended solely for the work in Agronomy, at present it accommodates, temporarily, three departments, with parts of others. The first floor, occupied by the department of Agronomy, contains eight rooms, and is especially arranged for such work as Agrostology, Soil Physics, and kindred subjects. The second floor contains nine large rooms, particularly arranged for the work in Domestic Arts, such as dressmaking, sewing, millinery, cutting, fitting, and modeling. The third floor, with eight rooms, is fitted for the work of the course in Commerce, consisting of accounting, shorthand, typewriting, banking, merchandising, and other phases of commerce.

The south or Horticultural wing is 72x130 feet, and three stories high. In the basement are located laboratories for plant propagation, spraying, vegetable preparation, and fruit packing. The basement also contains the general storage rooms for the department, and rooms which are especially adapted for the storage of fruits. The first floor contains the offices of the Division of Horticulture, the research laboratory, systematic pomology laboratory, and three large lecture rooms. The second floor contains the offices of the department of Botany and Plant Pathology, three recitation rooms, and three student laboratories. The third floor contains the horticultural museum and horticultural herbarium, photograph room, large student lecture room, drafting rooms, lecture rooms, and office of the Landscape Gardening Section. These rooms are all especially well lighted and contain every convenience for conducting the work with efficiency.

GREENHOUSES. A new range of greenhouses, modern in every respect, has recently been constructed with a view to aiding the student in his studies in commercial greenhouse work. The range is made up of five even-span houses, three ninety feet long by twenty feet wide, and two thirty-three feet long by twenty feet wide, making the total area under glass 6,720 square feet. A modern hot water heating apparatus has been installed, with valves and pipes so arranged that different temperatures can be

maintained in every separate thirty feet of house in the three long houses. Each of the large houses has been divided into sections thirty feet long so that the entire space in each may be given up to a single crop. Of the two smaller houses, one is given up to research work and one to the propagation of plants in general. The central building is large and conveniently arranged for all work that is to be met within greenhouse establishments. Such crops as carnations, chrysanthemums, violets, palms, ferns, general pot plants, and forced vegetables, like tomatoes, lettuce, and cucumbers, are grown in these houses.

DAIRY BUILDING. About sixty feet to the northward of the Agricultural Building is located the new Dairy Building. The general scheme of both outside and inside finish is similar to that of the Agricultural Building. The structure is 54x141 feet, three stories high. On the first floor are located the offices of the Dairy Department and commodious laboratories for butter making, cheese making, and market milk instruction, including a well equipped boiler and engine room and student lockers. On the second floor are the testing laboratory, advanced laboratory, farm dairy and shop rooms, two recitation rooms, office, exhibit, and drafting rooms. The third floor is temporarily occupied by the department of mathematics, with the exception of a general lecture room, extending across the south end of this floor, and having a seating capacity of two hundred.

THE MINES BUILDING, which is 65x81 feet, is located about 100 yards northwest of the Administration Building, and is the newest building on the campus. This building forms the northern boundary of the quadrangle which is planned in the new building scheme on the College campus. It is a fine four-story structure, constructed of brick, trimmed with stone, and similar in type to the new Agricultural Hall. The first floor of the building contains the main offices, assaying, metallurgical and ore dressing laboratories. The basement contains the crushing and sampling rooms, the ceramic laboratory and stock rooms. On the second floor will be found the Bureau of Mines laboratory and lecture and class rooms. On the third floor is the geological museum, the mineralogical and petrological laboratories and drafting room. All

the laboratories are provided with water, gas, electric lights, and steam heat.

MECHANICAL HALL, about one hundred and fifty yards north-east of the Administration Building, is 90x120 feet, two stories high, and constructed of Oregon gray granite and sandstone. It is a fine, substantial building, well arranged and admirably adapted to the purpose for which it is used. Besides recitation and lecture rooms for the classes in Mechanical, Electrical, and Civil Engineering, it contains the Physical and Engineering Laboratories.

MECHANICAL ARTS BUILDING is a modern, well-lighted structure of brick with cement foundations, 52x52 feet, two stories high, flanked by a one-story wing on the east, 40x220 feet, and a similar wing on the south, 40x200 feet. The central portion contains the office of the Dean, a display room for student work, a tool room for the machine shop, and a finishing room for the wood shop. On the second floor is a general drafting room, 30x50 feet, with a commodious blue-print room and a dark room adjoining. The south wing contains the main wood-working shop, 40x97 feet, a stock room, 30x40 feet, a carpenter shop, 20x40 feet, and the College printing plant, 40x50 feet. The east wing contains the machine shop, 40x80 feet, the blacksmith shop, 40x100 feet, store room for coal and iron, lockers, and toilet rooms.

THE FOUNDRY is immediately south of the blacksmith shop; it is built of brick and contains one 35-inch Colliau cupola for melting iron, one brass furnace, one portable core oven, and one stationary core oven for larger work; also pouring ladles, crucibles, snap flasks, and the usual equipment of hand tools for green sand moulding.

THE GYMNASIUM is situated about two hundred yards south of the Administration Building. The structure, 70x120 feet, is built of stone and wood. Its one large room is also used as a lecture hall and assembly room, or a place for entertainments when large audiences are to be accommodated. It will seat fourteen hundred persons. It has lockers and dressing rooms for six hundred men. The showers in the bath room are of modern design, and hot and cold water are available throughout the year. The floor of the gymnasium, with its 8,000 square feet of space, is surmounted by

a balcony and running track, suspended from the rafters. Basket ball court, 79x54 feet, indoor baseball diamond, and courts for various winter and indoor games, are provided on the main gymnasium floor.

THE ARMORY is situated about three hundred yards south of the Administration Building. It is one of the largest of its kind in the United States and is built of concrete and steel, 126x355 feet. The drill hall portion has an unobstructed area of 36,000 square feet. The arms room, offices, and drill hall afford facilities for the accommodation of 1,000 men.

THE POWER PLANT, a one-story brick building in the rear of Mechanical Hall, contains the requisite equipment for supplying the various buildings with heat, light, and power. The apparatus installed in this building serves the purpose also of demonstration equipment in these special lines.

THE NEW HEATING PLANT, located south of the Armory, is a one-story reinforced concrete building, with a concrete tunnel and conduits leading to the various buildings on the south side of the campus. It contains one two-hundred-fifty horsepower boiler with the necessary equipment for heating the buildings connected with it.

WALDO HALL, the women's dormitory, occupies a commanding site one hundred and fifty yards west of the Armory. It is a large building of striking appearance, with a cement foundation and basement wall, and a cream-colored, pressed-brick superstructure, three stories high. The dimensions are 96x240 feet; and it contains one hundred and fifteen rooms for students, besides a kitchen, dining room, parlors, and Domestic Science laboratories. It is modern in all its appointments and finished throughout in natural grain Douglas fir, stained to conform to the color scheme.

CAUTHORN HALL, the men's dormitory, is a well-proportioned frame building, situated on a slightly spot in the extreme western part of the campus. It is 160x50 feet, has three stories and basement, and contains sixty-two rooms, besides a large kitchen, dining room, and reception rooms. Its furnishings and appointments are adequate and in harmony with its use. Each floor is supplied with hot and cold water, baths, electric light, and steam heat.

SHEPARD HALL, the student building under the auspices of the Y. M. and Y. W. C. A., was completed at a cost of something over \$22,000. The original plans were somewhat modified, giving in many respects a better building than planned at first. This building contains in the basement a swimming pool, shower baths, lockers, banquet room, kitchen, wood room, and accessories. The first floor contains a large lobby which is used for a reading room, game room for social events, and general assembly. It also contains an office for the General Secretaries, a public office, a cabinet and check room combined, a room for the Y. W. C. A., and one to be used jointly by the Athletic Association and the staffs of the different College papers. The second floor contains six rooms for the use of the literary societies. The third floor is devoted for the present to dormitory purposes. The building is known as Shepard Hall, and is a fitting tribute to the memory of Clay Shepard, who gave his life to the cause of cleaner, higher, and truer citizenship as exemplified in student life.

FARM BUILDINGS. The College Farm is now well equipped with farm buildings, and modern facilities for conducting practical and scientific work in animal husbandry.

THE NEW BARN is commodious, modern, and attractive in design. It is a frame building, with cement foundation and brick pilasters. The main part is 50x100 feet, two stories high, with two wings extending to the south, each 46x80 feet, one story in height. There is also a milk room, an engine room, and a fuel room. The building is utilized as a general barn, and will accommodate nine horses and seventy cattle, with sufficient space for the storage of feed. On the first floor of the main portion are located the horse stalls, bins for storing the various grains and mill feeds, a seed room and space for vehicles. The concrete basement is of sufficient dimensions to permit the storing of about one hundred tons of roots. The second floor has a storage capacity for one hundred tons of loose hay. A prominent feature of the barn is the cow stable. This is strictly modern, well lighted and ventilated, with concrete floor, thirty individual, tubular-iron adjustable stalls, and two commodious box stalls. The aisles are wide, and thus not only furnish an abundance of air space for the animals, but

also afford visitors an excellent opportunity to view the stock. The milk and engine rooms are conveniently situated but sufficiently isolated for proper sanitation. This building is lighted by electricity, well supplied with water, thoroughly sewered and furnished with an elaborate system of bell traps.

The old barns were moved and remodeled so as to harmonize with the new structure. They contain rooms for housing machinery, sheds for fattening cattle, and a commodious piggerly.

THE STOCK JUDGING BUILDING. The Animal Husbandry work of the College has been aided during the past year by the erection of a new judging pavilion. This pavilion provides very comfortable and commodious quarters for all of the live stock work. The main room is 40x90 feet, well lighted and provided with steam heat. A movable partition is provided whereby this large room may be divided into two smaller ones, each large enough for all ordinary purposes. The live stock work in the past has been very much handicapped by crowded quarters without heat or good light, but these difficulties are now past and the department is in a position to do much better work than before.

FARM MECHANICS BUILDING. A new building has recently been completed for the Farm Mechanics work. It is an attractive, well-lighted brick building, having a large operating floor, a class room, locker room, shop, and tool room on the first floor. This operating floor is of cement and is roomy enough for demonstration and for the operation of the heavier farm machines. Within this place is reserved space for the very heavy farm tractors. A gallery surrounds this operating floor and provides space for the lighter farm implements such as the tillage, haying and harvesting machines.

The building is equipped with shafting, belting, and power for the operating and testing of the various machines. A large well is provided for making pump tests and a very large equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest; so that the student has constantly before him and is working with and studying the very best classes of farm machinery of all types.

Representative machines are found in the laboratory as follows: plows, harrows, pulverizers, cultivators, plant setting machines, corn planters, potato planters, grain and grass seeders, mowers, rakes, binders, sprayers, manure spreaders, potato diggers, wagons, etc. Among the power machines are stationary gasoline engines, various types of pumps and pressure water systems, feed grinders, gasoline tractors, steam tractors, gang plows and complete threshing machines. All of this expensive equipment is available to students in Farm Mechanics in the regular and short course work.

THE POULTRY HOUSES. On a ten-acre tract of land, lying southeast of Cauthorn Hall, and west of Waldo Hall, there have been erected several buildings specially planned for the needs of the department of Poultry Husbandry. These buildings comprise an incubator house, with a capacity of twenty-four incubators and complementary apparatus, and thirty colony houses for laying stock and growing chicks. The colony houses are movable and constructed upon a plan that could be adopted by any farmer. The colony brooding coops are also portable, and are used for investigations in both natural and artificial brooding.

EQUIPMENT

It is impossible, in the brief space that is devoted to this topic, to give more than a bird's-eye view of the equipment of the institution. However, the following data have been so arranged as to give the prospective student a very good general idea of the comprehensive equipment that the institution possesses for carrying forward its designated work.

AGRONOMY. The new Agronomy Building provides spacious and well lighted offices, class rooms, laboratories, store rooms, and other facilities for this work. The large soil laboratory is newly equipped with the most modern apparatus for an exhaustive study of the physical properties of soils and of problems of soil fertility. Abundant desk and locker room, supplied with running water, gas, compressed air, and electricity, is furnished for sections of fifty students. Compound microscopes, compacting machines, aspirators, percolators, capillary tubes, mulch cyclinders, electric centrifuges, shakers, and sifters, electrically heated air baths, thermometers, soil sieves, scales, analytic balances, chemical apparatus, pots and wire baskets, and greenhouse room, form part of the equipment for the work in Soil Physics and Soil Fertility. Soil surveying and mapping outfits, soil survey charts of the United States, and specimens of the chief soil types of Oregon and of the United States are being assembled.

For the work in Crop Production, another large laboratory is provided with special grain-judging compartment desks, sufficient to accommodate sections of thirty students. Part of the apparatus used for the several courses in this subject are grain sampling and mixing machines, complete sets of compound microscopes, dissecting microscopes, and large, mounted field lenses, general and special germinating chambers, various types of germinators, grain tester, grain receptacles of all kinds, and complete sets of seed and plant

specimens. Each student is provided with samples of both the seed and the plant of all the important field crops and weeds of Oregon and of the United States.

Farm Mechanics is provided for in a separate building on the farm, fitted with shafting and power, and fully equipped with all classes and types of tillage implements, manure spreaders, seeding, harvesting, and power machinery, farm engines of all kinds, together with apparatus for testing these machines. Drain tiles, surveying instruments, tile and ditching tools are furnished for drainage and irrigation work.

The Agronomy class rooms have demonstration tables, lantern facilities, illustrative charts of various kinds and a new reference library.

ANIMAL HUSBANDRY. The equipment of the department of animal husbandry consists essentially of the barns and live stock of the college stock farm. The live stock available for illustration and demonstration purposes includes typical specimens of Short-horn and Angus cattle; Cotswold and Shropshire sheep; Berkshire, Yorkshire, Poland China, and Duroc Jersey swine; Belgian, Percheron, Clydesdale and Standard bred horses, together with the live stock being used in the experimental feeding tests. In addition to the live stock regularly kept on the college farm, much good stock is brought in from time to time by the leading breeders of the State. The college also possesses the necessary maps, charts, slides, studbooks, and other equipment for conducting the various lines of lecture, laboratory, field, and research work necessary to a broad course of study in the several phases of Animal Husbandry.

DAIRY HUSBANDRY. Commodious quarters are provided for this department in the new Dairy Building. The equipment is such as to permit handling milk and cream on a commercial scale, thus giving the student practice under actual factory conditions. The offices and manufacturing rooms are located on the first floor, the latter including a boiler room equipped with a 15 H. P. Internal Furnace boiler and a 10 H. P. Jewel Automatic steam engine. In the separator room are found turbine, belt and electric driven separators and the refrigerating machine. The churn room is provided with modern ripeners, combined churns and various

forms of butter molding appliances. The market milk room has a concrete sterilizer, a bottle washer, a bottle filling machine and milk coolers. The cheese room equipment includes a regulation cheese vat, small vats for individual student use, automatic pressure cheese press, curd mill, and various smaller articles to be found in a properly equipped cheese room. Two curing rooms adjoin the main cheese making laboratory.

On the second floor are located recitation rooms, exhibit and reading rooms, shop, farm dairy, advanced and general laboratories. The latter will accommodate two hundred students in sections of forty each, and are equipped with a full line of appliances for testing milk and milk products. In the advanced laboratory will be found moisture tests, salt tests, curd tests, and various other forms of apparatus suited to the needs of the advanced student. A circulating hot water system connects the wash sinks in all the laboratories. Both steam and electricity are used for power purposes.

HORTICULTURE. The new Horticultural Building contains many spacious rooms, and splendid equipment for teaching the various subjects. In the basement will be found a large spray laboratory furnished with gas and water and all the equipment, chemicals, and apparatus which are necessary to teach students the proper mixing and testing of the different sprays; accommodations are offered also for the testing of nozzles and spraying apparatus. The department has a large number of hand and power spraying outfits that are placed at the disposal of students.

A large, well lighted plant propagation laboratory offers unexcelled opportunities for the study of plant propagation. Specially equipped cabinets, tables, and incubator have been constructed; so that the students can handle to advantage such topics as seedage, layerage, making of cuttings, and budding and grafting.

A laboratory has been especially fitted for the use of students in gardening. It contains large cement set tubs, where students are taught the proper method of preparing vegetables for market. This room also contains a demonstration earth bed for use during the winter to show how the various tools for planting seed and cultivation are used. The demonstration bed also allows the

instructor to demonstrate the proper method of interplanting and transplanting of plants.

In the basement is also located a very large fruit packing laboratory especially equipped with fruit presses, packing and grading tables. The large storage rooms are also located in the basement and include a suite of rooms which are chilled by mechanical refrigeration.

On the first floor a systematic pomology laboratory is especially equipped for the study of nuts, fruits, etc. A special research laboratory; found on this floor, is used for the research assistants in the department, and is also at the disposal of advanced students. This room is splendidly equipped with ovens, microscopes, and similar apparatus necessary for extensive research work.

On the top floor is the horticultural museum, which is found to be of great value, as in this room are stored all sorts of equipment used in Horticulture, such as pruning shears, budding and grafting utensils, prune drying apparatus, fruit grades, etc. The Department also has on this floor an herbarium which is especially supplied with the plants used in Horticulture. On this floor is also found a large drafting room, extending along the entire south end of the building, which is supplied with tables, cabinets, etc., for the use of students studying Floriculture, Landscape Gardening, and Greenhouse construction, Orchard Planting, and Packing House construction. In addition to these rooms, the department has four large lecture rooms. A balopticon with a good collection of lantern slides, and a large library, add materially to the equipment.

The department is also especially provided with tools and apparatus necessary for conducting field exercises in Truck Gardening, Floriculture, Landscape Gardening and Pomology.

POULTRY HUSBANDRY. The equipment of this department consists of a number of poultry houses of different types; about 1,000 fowls of several breeds and varieties, twenty incubators of six different makes; brooders of different types; hatching, brooding, and colony coops; bone and clover cutters, trap-nests, and various other appliances necessary for practical poultry keeping. There are also sets of charts, lantern slides, motion pictures, and photographs, illustrating breeds of fowls, poultry farms and houses.

BACTERIOLOGY. This department now occupies new and commodious quarters on the fourth floor of the Agricultural Building. It has much more room at its disposal than heretofore, occupying at present three large laboratories, besides an incubator room and a smaller room for a library. The laboratories in general and advanced Bacteriology are completely equipped for work in this science. Apartment, lead-topped desks, individual wall lockers, cylindrical and square copper sterilizers supplied with steam from the main heating plant, small and large hot air sterilizers, a small and a large steam pressure sterilizer, the latter measuring 14x22 inches inside chamber, and arranged for "dry steam" sterilization, are conveniently arranged in the general laboratory for the larger sections. Small incubators are used by the advanced students, while a large incubator room, steam heated, is within easy access to both general and advanced laboratories. Lead-topped tables with convenient drawers furnish ample working space. Hot and cold water is supplied to a large 14-foot sink, fed by the main water system and by a 40-gallon hot water tank. Each desk and locker is equipped with a complete outfit of microscopes and accessories for high power work. There is a complete collection of common and precision glassware; and all the other necessary minor equipment for work in bacteriology is at the disposal of elementary and advanced students. There is a splendidly equipped dark room fully fitted up for work in photomicrography. In connection with this room there is an arc lamp for illumination purposes for this work.

This department is now presenting courses dealing directly with the following lines of work: Agriculture, pharmacy, clinical, vaccine therapy, home economics, sanitation, yeast culture, dairy, soil, water and sewage, and poultry diseases.

BOTANY AND PLANT PATHOLOGY. This department occupies the entire second floor of the Horticultural wing of the Agricultural Building. Besides three general student laboratories, a special laboratory for plant physiological work and an herbarium room, which is also used as an instructor's preparation room, are provided. This latter room is equipped with desks for special and graduate students. A large, well-lighted laboratory is provided for the experimental work in plant pathology. A small room for the

Department library and records is available. A special physiological dark room for experimental work in plant physiology is provided. The student laboratories are equipped with large student tables, each of which will accommodate four students. Compound and dissecting microscopes are provided for each student. The physiological laboratory is equipped with the essential apparatus for modern laboratory courses. The research laboratory in Plant Pathology has the most modern equipment available.

The phanerogamic herbarium of several thousand mounted and many thousand unmounted plants is particularly rich in Oregon forms, while containing quite extensive collections of the New Mexico, California, Michigan, Washington, and Alaska floras. The herbarium is being rapidly enlarged by purchase and exchange; particular attention is being given to the accumulation of economic material including the forest and shade trees of North America, agricultural plants of the world, pharmaceutical plants, weeds and grasses of economic importance. Large and miscellaneous collections of the various groups of cryptogamic plants are being assembled. Particular attention is being given to the collection of parasitic fungi for use in the work in Plant Pathology. A private collection of about five thousand specimens of fungi particularly rich in parasitic forms has been temporarily loaned by H. S. Jackson for the use of students and instructors.

A large amount of class study material is preserved in alcohol for the use of classes. A well selected collection of microscopic slides, photographs, lantern slides, and charts is provided and is being rapidly enlarged.

ZOOLOGY. The laboratories of this department occupy the following rooms on the third floor of the new Agricultural Hall; three offices, three research laboratories for entomology, physiological laboratory, general laboratory for zoology, lecture room, vault and photographic dark room. The general laboratory is equipped with desks with individual drawers to accommodate 280 students; each desk is provided with compound microscopes, dissecting microscopes, and various minor pieces of apparatus. The physiological laboratory is similarly equipped for 225 students and in addition is provided with an articulated skeleton, a dissectible human skull, a com-

plete Azoux model of the human body, greatly enlarged Azoux models of the brain, eye, ear, and other organs, a set of the celebrated Leukart zoological charts, and a good supply of specimens and dissections for illustrating the work in physiology. The entomological laboratory contains the entomological collections and a portion of the department library, and although used as a research laboratory for the head of the department and assistants, it is fully equipped for twenty-four advanced students. The laboratories are provided with high grade compound and dissecting microscopes, a Minot rotating microtome, a Minot automatic precision microtome, water bath, 5x7 view camera, 4x5 micrographic camera, laboratory balances, eye-piece, and stage micrometers, and an abundant supply of minor instruments.

The museum contains, in addition to a beautiful collection of native birds, a small collection of mounted mammals, the Ladd collection of bird skins, a large collection of eggs of native birds, a small collection of fishes and reptiles, a considerable number of marine invertebrates, including a small but beautiful collection of Philippine shells, an extensive collection of native insects, and numerous specimens of a miscellaneous nature.

FORESTRY. The department of Forestry occupies the third floor of Science Hall. It has a complete herbarium of the forest trees of the Pacific Coast, as well as a cone and seed collection representing the important commercial conifers of the United States. It has apparatus for applying preservatives to timbers by the open tank method, timber testing machinery, incubators for testing tree seeds, wood specimens, stereopticon and slides, compound and low power microscopes, hypsometers, increment borers, scale sticks, calipers, Biltmon sticks, surveyors' compasses and chains, pack outfits, axes, saws, drafting tables, and other equipment necessary for efficient laboratory and field work. Valuable collections of tools used in logging have been loaned the department by several commercial companies. A nursery has been established on the College farm, in which native and exotic timber-tree seedlings are being grown. The City Water Company of Corvallis has placed a timbered tract of eighty acres at the disposal of the College for demonstration purposes.

DOMESTIC SCIENCE. The department is at present located on the basement floor of Waldo Hall and on the second floor of the central Agricultural Hall. There are three large school laboratories, a lecture room, and offices in the Waldo Hall basement. The school kitchens are equipped with work tables, cupboards, ranges, gas stoves and all necessary utensils and modern conveniences for teaching cookery. The dining room, which is on the first floor of Waldo Hall, is furnished with an extension table, chairs, cupboards, china, silver and table linen. A recitation room and the Dean's offices are on the second floor of the Agricultural Hall.

DOMESTIC ART. The entire second floor of the Agronomy Building is allotted to the work in Domestic Art, containing rooms for hand and machine sewing, cutting and fitting, millinery, household decoration, and a rest room for the young women. The machine rooms are furnished with the latest improved machines; and the sewing rooms are provided with tables, electric irons, wardrobes, and cupboards for holding unfinished work, large display cabinets for finished work, and cabinets for the collection of samples showing the processes of manufacture of cotton, wool, silk, and linen.

CIVIL ENGINEERING. In addition to joint use with the other engineering departments of the testing laboratories described elsewhere, this department has for its exclusive use a suite of six well-lighted rooms, suitably arranged on the second floor of Mechanical Hall. This suite includes an office, two recitation and lecture rooms; an instrument room and a drafting and designing room; also a well equipped blue print room with a cylindrical electrical blue print machine, sun frames, and washing pans.

The drafting and designing room, 28x47 feet, is well lighted and fully equipped with thoroughly modern and convenient drawing tables, supplied with individual lockers for instruments and other apparatus. The instrument room is conveniently arranged, having an individual glass-front case for each instrument and its accompanying equipment, which includes marking pins, tape, range-poles, notebook, etc. The instrumental equipment includes the following: Twelve transits, four of which are provided with solar attachment; eight levels, four plane-tables, one compass and two current meters, all high-class instruments of various standard

makes and styles; a sufficient supply of level and stadia rods, range-poles, tapes, chains, plain and prismatic compasses, aneroid barometers, clinometers, planimeters, plumb-bobs, hand levels, etc., together with a well-selected assortment of specifications and blue print plans of engineering structures for illustrative purposes.

ELECTRICAL ENGINEERING. The laboratory of this department occupies a large part of the west half of the first floor of Mechanical Hall, and is divided into several rooms; one for testing, one for instruments, and another for supplies. Besides the equipment therein, including generators, motors, and other apparatus, the machinery in the College Power Plant, and sub-station is available for study and testing purposes. Three-phase electrical energy is supplied by the long distance transmission line or by the local generating unit as desired.

In the laboratory is a 6½x15 foot switchboard, consisting of three asbestos wood panels on which are mounted a number of voltmeters and ammeters for direct and alternating current; a power factor meter; a frequency meter, and synchroscope; a set of synchronizing lamps; circuit breakers; switches; and a large number of plug terminals, the leads of which extend to the eight machine platforms; two slate panels with instruments and switches for direct current machines; and an arc light regulating panel. Immediately adjacent thereto is a controller, auto-transformer and rheostat rack, six feet high by sixteen feet in length.

The machine platforms just mentioned are four feet wide by fourteen feet long, and have upon them the following equipment: One five, one seven and one-half, one ten, and one fifteen horse power, three-phase, induction motors; two five, two seven and one-half, two ten, and two twelve and one-half kilowatt, 125-volt direct current generators; one ten-kilowatt double current generator, and one two-kilowatt rotary converter; two two and one-half kilowatt induction motor generator sets; one two and one-half kilowatt synchronous motor generator set; one seven and one-half kilowatt revolving field alternator, with three additional rotors, and one seven and one-half kilowatt revolving field alternator, from both of which current of single, two, three, four and six phases may be taken; one five-arc light regulating, one ten-kilowatt 110,000-

volt high tension testing, one ten-volt 1000-ampere welding, one five kilowatt 15,000-volt wireless, three 7½ kilowatt, 2200-220,110-volt transformers with ten taps each in the secondary, giving nine different voltages from 24 to 220 volts, with 87% taps in both primary and secondary for transformation from three to two phases or the reverse, and a number of ordinary transformers and compensators.

The instruments available are ample in number and range, and consist of direct and alternating current voltmeters and ammeters; milli-voltmeters and shunts; wattmeters and watthour meters; and the following precision instruments for standardizing: One ammeter and one voltmeter operating on the Kelvin balance principle; one poly-phase and two single-phase indicating wattmeters, and one 100-ampere manganin shunt.

MECHANICAL ENGINEERING. The department laboratories contain the apparatus necessary for the work in calibration, strength of materials, testing of lubricants, power engineering and hydraulics. This equipment is described in detail under the headings of Experimental Engineering and Shop Work.

EXPERIMENTAL ENGINEERING. Appropriate portions of the equipment for this work are used by all departments of the Engineering School and by the department of Forestry. The equipment comprises the following divisions: A material laboratory, a cement laboratory, and a power and hydraulic laboratory. These divisions have in common the equipment for the preliminary work, such as calculating devices, several high grade planimeters, Amsler integrator, micrometers, and other general apparatus.

Among the appliances in the materials laboratory there are for general work: A 150,000-pound Riehle universal testing machine fitted with extension table for beams up to 16 feet in length; a 50,000-pound Riehle automatic and autographic testing machine; a 60,000-pound-in. Olsen torsion testing machine; a 400 ft.-pound drop testing machine built in the College shops; a Case tempering furnace with pyrometer; Scleroscope and Brinell ball hardness testers; and auxiliary apparatus including a deformeter, torsion indicator, compression micrometers, several extensometers, deflectometers, and other minor pieces.

A part of the main laboratory also is devoted to the testing of materials for highway construction. This equipment includes the following: Olsen impact machine for toughness tests, Riehle machine for hardness tests, rattler for macadam or paving rock, another for paving brick, core drills and saw for cutting stone specimens, sieves for mechanical analysis of sand and aggregates penetrometer, viscosimeter, float test, centrifuge, and other appliances for making physical tests of bituminous cements and road oils.

The cement testing laboratory is equipped with convenient glass topped tables for mixing, intended to accommodate two students each. Apparatus is provided sufficient to make all standard A. S. C. E. tests, as well as for some additional experiments. There are a large number of briquette, cube, and cylinder molds, three Vicat needles, Gillmore needles, standard screens, moist closet, aging tanks, boiling test apparatus Bohme hammer and Olsen briquette molding machines, a 1000-lb. Fairbanks cement testing machine, permeability apparatus for testing various mixtures or water-proofing compounds, and small apparatus including balances, sampling irons, towels, etc.

For work in steam and power engineering there is available the equipment of the College Power Plant as well as that of the new heating plant. In the latter are two Flanner water-tube boilers of 155 and 250 H. P. capacity; these are oil fired and supplied with thoroughly modern auxiliary equipment including feed water and oil meters, thermometer wells, flue gas sampler, etc. The power plant equipment consists of a bank of three fire-tube boilers of 170 H. P., supplying steam to part of the heating system and to a 40 H. P. Ideal automatic high speed engine which drives a 3-phase generator. In addition to this there are the following: A 7x8 throttling engine, two four cycle and one two cycle gasoline engines, an 8-inch Reeco-Ericson hot air engine, two duplex pumps, and a centrifugal blower. All the engines are fitted with various types of brakes and other auxiliaries for testing. The plant also affords facilities for testing boiler auxiliaries, such as injectors, feed water heaters, vacuum pumps, etc. Of smaller apparatus there might be mentioned a transmission dynamometer; General Elect-

ric steam meter; guage tester; five indicators, one a Trill instrument with continuous drum, reducing wheel, and high pressure piston; two steam calorimeters; fuel calorimeters; flue gas sampling and analysis apparatus; two pyrometers; draft gages; recording and indicating pressure gages, etc.

In the general laboratory tests may also be made on lubricants, bearing metals, and different types of bearings, by means of a Golden Bearing and Oil Dynamometer, or a Thurston oil testing machine. There are also provided the usual minor pieces, as flash point apparatus, viscosimeter, etc.

The hydraulic equipment consists of a centrifugal pump driven by a rated variable speed motor, several steam pumps, 12-inch Doble laboratory water motor, hydraulic ram, 2-inch Venturi meter, current meter, two ordinary water meters, calibrating tanks, orifice boxes with suitable plates, weirs, hook gage and other small apparatus. In addition to work in the laboratory, measurements and tests of neighboring streams and installations may be made.

THE WOOD SHOP, supplied with the best machines and tools the market affords, contains twenty-four double benches of modern design, accommodating forty-eight students. Each bench is provided with patent rapid action vises for holding the work, and is furnished with two sets of hand tools, consisting of rip saws, cut-off saws and back saws, planes, chisels, paring gouges, marking gauges, try squares, hammers, dividers, and oil stones. The machine equipment of this shop consists of fifteen wood-turning lathes, each furnished with a set of tools; one iron saw-table with rip and cut-off saws, one band saw, one jig saw, 24-inch surface planer, 16-inch glue joiner, post boring machine, swinging-arm sander, two grind-stones, one concave for gouges and one straight for plane irons and chisels; there are also two glue tables with clamps of various sizes and one steam and gas glue heater of three gallons capacity; the power is furnished by two three-phase induction motors of fifteen horse-power each.

Nearly all of the mill work for repairs, and the cabinet work for new equipment in the various departments of the college is made in the manufacturing wood shop. This shop contains a full

line of machinery which is also available for the instruction of students. The principal items are, a 40-inch combined band saw and re-saw, 14-inch self-feed circular rip saw, 14-inch swing cut-off saw with electric motor attached, 30-inch single surfer, 8-inch jointer and buzz planer, tennoning machine with cut off attachment, power mortiser and borer combined, dowel machine, swinging arm sander, 48-inch triple drum sander, and a four-sided 4-inch moulder.

THE FORGE SHOP contains forty-two down draft forges of the most improved pattern. Blast is furnished by a steel pressure blower driven by a 10-horse-power induction motor, and the smoke and gases are removed by an 80-inch exhaust fan, driven by a 20-horse-power motor. Each forge is provided with anvil, hammers, hardies, tongs, and other small tools. There are also swedge blocks and vises at convenient points in the room for general use.

THE MACHINE SHOP contains one 24 x 24-inch iron planer, one 15-inch shaper, one 12-inch shaper, one universal milling machine, one universal tool grinder, one wet tool grinder, one radial drill, one 20-inch drill press, one sensitive drill press, one 20-inch engine lathe, one 16-inch engine lathe, one 16-inch universal turret lathe, one 14-inch modern geared lathe, five 14-inch engine lathes, two 10-inch speed lathes, one shop saw, one automatic knife grinder, and twelve bench vises. A 20-horse-power induction motor furnishes the power. A tool room adjacent contains the small tools, such as twist drills, taps, dies, reamers, calipers, gauges and scales. These tools are given out to the students on the check plan.

THE FOUNDRY contains a modern foundry equipment consisting of a cupola, brass furnace, core oven and accessories.

The Plumbing and Steam Fitting Shop is equipped with all of the hand tools necessary for cutting, threading, and general pipe work, as well as gasoline torches, soldering outfits, and other apparatus for making lead pipe connections and wiped joints.

MINING ENGINEERING. The new Mines Building provides spacious and well lighted offices, laboratories, and lecture rooms for work in this department.

The Assaying and Metallurgical laboratory is a cement-floored room 30 feet wide and 60 feet long on the first floor of the building extending across the entire east end. It is well illuminated as it has windows on one side and both ends. At the south end of the room are the most modern type of oil-fired furnaces for all fusion and other fire work. Conveniently arranged nearby are suitable lockers and work tables with the necessary tools, fluxes, etc. The north end of the room is amply equipped with sinks, ventilating hoods, gas burners, electric hot plates, and other paraphernalia of use in carrying on the various operations involved in parting buttons, assaying solutions, making cyanide tests, etc. One corner of the laboratory is partitioned off for a balance room and provided with the most delicate balances obtainable for weighing the gold beads. Balances of both Keller and Ainsworth make are available. These are mounted on a specially constructed table not connected with the floor in order to avoid vibration.

The Crushing and Sampling laboratory in the basement is 25 feet by 30 feet. It contains a power driven sample crusher of the latest design and one of the recently modelled disk grinders, for properly pulverizing samples for assay or other purpose. The usual bucking board and muller and other hand grinding devices are also available for use of the students at any time, together with the Jones sampler and other appliances used in preparing samples. Such work will all be done here, so as to keep dust and disturbance occasioned by such work out of the assay laboratory.

The Ore Testing laboratory is a room 25 feet wide by 30 feet long on the first floor of the building. It is equipped with appliances for studying the behavior of ores when subjected to the various concentrating operations of jigging, vanner, and table concentration.

The equipment in the Ceramics laboratory comprises a convenient chemical laboratory for analysis of silicates, a complete mechanical outfit for the preparation of clays for the manufacture of brick, tile, pottery, terra-cotta, etc., including machinery for grinding, tempering, washing, filtering, and molding. The laboratory will be equipped with kilns, burning crude petroleum, in

which a large number of brick or equivalent quantity of tile or pottery can be burned. The laboratory will also be equipped with smaller muffle kilns to be used especially for clay testing and glazing experiments. There will also be a ceramic museum containing samples of American pottery and clay products of every class.

The Geological and Mining Museum on the third floor will be fitted up with a number of glass top cases in which will be exhibited large and attractive specimens of minerals and rocks, not only from our own State, but coming from all over the United States. In the museum will also be found large collections of the different manufactured geological products, including samples of all the different grades of brick, tile, pottery, terra-cotta and cement manufactured products, together with the raw materials from which the same are manufactured.

The Mining Drafting room will be equipped with convenient desks and tables and all necessary equipment for the use of Mining students.

The Mineralogical laboratory possesses the following collections:

No. 1, the Mineral Type Collection consisting of about 1,500 characteristic and labeled specimens used by the students for the purpose of study and comparison.

No. 2, an Exhibit Collection of minerals consisting of large and attractive specimens.

No. 3, a Working Collection of minerals consisting of about 4,000 unlabeled specimens similar to those in the Type Collection.

No. 4, a Crystal Collection containing about 1,000 natural crystal forms.

No. 5, a Crystal Model Collection consisting of 48 large glass crystal models and about 500 smaller wooden models used by the students in the study of crystallography.

No. 6, a Blowpipe Collection containing minerals and metals used in blowpiping.

The Petrological laboratory contains the following collections:

No. 1, the United States Geological Survey Educational Series of rocks containing 165 characteristic rock specimens from all over the United States.

No. 2, the Foote Rock Collection containing 150 specimens of characteristic rock types.

No. 3, the Structural Mineral Series containing about 100 specimens of all the different rocks used for structural purposes.

No. 4, the Working Collection of rocks containing about 2,000 unlabeled specimens for the use of the students in the work of petrology.

COMMERCE. This department is completely equipped for thorough and efficient work in modern business courses. Each room is specially designed and furnished for the work to be conducted in it. The furniture of the department consists of individual desks and counters, a complete set of modern banking fixtures, a wholesale house, a retail house, a commission house, freight, real estate and insurance offices. Permanent blank books, letter files, rubber stamps, copying presses, college currency, blanks and similar material are provided by the College. A Burroughs Adding Machine is in constant use in the department. The room for typewriting contains twenty standard machines, each provided with approved conveniences for the operator. The room for stenography is furnished with tables designated for convenience in practical work; also equipment for illustrating various systems of filing. The department of Political Economy is developing a commercial museum for use in the various courses in social science.

PHARMACY. This department has its lecture rooms and laboratories in Science Hall, a building which amply meets the needs for space, light and ventilation.

In the way of equipment, in addition to the usual permanent fixtures such as desks and apparatus for the individual students, the department is supplied with a number of special pieces of apparatus for general use, such as pharmaceutical stills, from the simple retort to the complicated vacuum still; drug mills, for hand and power; suppository machines, for fusion and for compression; tablet machines, mold and compression; pill machines; tincture presses; capsule filling machine; percolators and much minor apparatus.

ART AND ARCHITECTURE. (a) *Art*.—The department occupies three commodious, well-lighted studies on the third floor of Agri-

cultural Hall. The rooms have north light, are well heated and ventilated, and furnished with suitable studio material, such as easels, drawing tables, portfolio racks, cast forms for models, architectural pieces, and a number of full figure pieces in full and bas-relief. There is also a good collection of still life objects.

(b) *Architecture*—The department is temporarily accommodated on the third floor of the Mines Building, where an office, which also serves as a draughting room for the instructor, is provided, together with a large drawing room, fitted with suitable desks, and facilities for recitation purposes. The department is well supplied with wall drawings, pictures, and portfolios illustrating different phases of the work.

The College Library has a well-selected and growing reserve in art and architecture. The course in the History of Architecture is illustrated by lantern slides.

CHEMISTRY. The department of chemistry occupies nearly all of the south wing of Science Hall, and one room in the basement of the central portion. In this latter room, aside from desk space for seventy-two students, is a 150-light Terril gas machine that supplies gas for the different laboratories throughout the building. The main lecture room is situated on the third floor, and has a seating capacity of one hundred and fifty. It is provided with lecture tables that are supplied with gas, electricity and water. Adjoining the lecture room is a small preparation room, in which is kept all special apparatus used for lecture demonstration, as well as supplies for the agricultural laboratory. This room is supplied with all the necessary apparatus for the proper elucidation of the principles of this branch of chemistry.

The organic laboratory is fitted for twenty-four students. Each student has a drawer and locker, a sink, a Richards' filter pump, a full set of reagent-bottles, individual gas and water outlets. Next to this laboratory is a room set apart for fuel and gas analysis and for photographic chemistry. The special apparatus of this room consists of Orsats bulbs, and pipettes, Winkler's burettes, the latest forms of Hompel's bulbs, Victor Myers', Dumas', and Hoffman's apparatus for molecular weight determination, Beckman's cryoscope, Landsberger's ebulliscope, Parr's latest form of colori-

meter, analytical and torsion balances, and the usual small pieces that accompany the above.

The largest room in the building is the main general laboratory, which will accommodate three hundred and ninety students, in four sections. Adjacent to this laboratory is a store room amply stocked with all necessary supplies and apparatus. The weighing room contains eight analytical balances of the best type for student use, and is well lighted and ventilated. The quantitative laboratory, which will accommodate seventy-two students in three sections, is in the basement, and adjoins the store room. It is fully supplied with various kinds of calibrated ware, as flasks, burettes, cylinders, urinometers, lactometers, hydrometers and barometers; centrifuges for rapid separation of precipitates, glass lamps for fusions, muffles for incinerations, tables for glass working, and much minor apparatus.

For work in Agricultural Chemistry an entire room is set aside. This room is fitted with gas, water, and electricity, condensers for distilled water, batteries, extraction apparatus for fats, nitrometers, Kjeldahl apparatus, hot water filtering apparatus, grinders for fodders, steam and air baths, calorimeter, polariscope, Westphal and analytical balances, coarse balance for rough work, hot-plates, and minor apparatus. This is one of the strongest divisions in the department and is lacking in nothing that makes a fully equipped agricultural chemical laboratory.

PHYSICS. The physical laboratory has a good working equipment for the study of general physics, the apparatus being such as to allow a qualitative or quantitative verification of all of the important laws by the student. In addition to the equipment of the general laboratory, there are many pieces of apparatus intended mainly for class room demonstration. Instruments are also available for the usual work in electrical measurements and the standardizing of electrical instruments.

THE GYMNASIUM is equipped with lockers and dressing rooms with accommodations for seven hundred men. In the shower-bath room, hot and cold water is available throughout the year, and free towels are furnished to the students. The floor of the gymnasium is surmounted by a balcony running-track, and a splendid playing space is provided for basketball and other indoor games.

The equipment includes horizontal bars, vaulting horses and bucks, parallel bars, swinging rings, travelling rings, wrist machines, Swedish wall racks, climbing ropes, wrestling and boxing mats, dumb bells, Indian clubs, Swedish wands and chest weights. The athletic field adjoining the gymnasium has within its bounds a quarter mile running-track, football gridiron and baseball diamond. Bleachers and grandstand accommodate the spectators.

Directly opposite the gymnasium is located the new Armory, with a dirt floor over one hundred yards long and fifty yards wide. The dirt running track in the Armory is an eighth of a mile long. These facilities afford opportunities for all of the athletic teams to train every day in the year. There are galleries for the spectators, and at indoor winter meets, 2,000 spectators can be easily accommodated. The regular gymnasium classes are taken to this indoor athletic field for part of their work in physical education.

THE EXPERIMENT STATION

The Station bears an important relation to the College, as the scientific investigations conducted at the Station strongly support the instruction given in the class room. Aside from the original investigations of economic significance to agriculture, the work of the Station affords daily object lessons in modern farm methods.

About three hundred acres of land are devoted to the use of the Station workers. This land is utilized by the various departments represented in Station organization, including the departments of Chemistry, Agronomy, Horticulture, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Entomology, Bacteriology, Botany, and Plant Pathology. Each department is actively engaged in the scientific investigation of problems presented by the different branches of agriculture.

As an illustration of the comprehensive character of this work, the following investigations, taken at random from the list of those now being conducted by the Station workers, may be cited. The value of such work, as an object lesson to the students in the various fields of agriculture, can hardly be overestimated. There are experiments with long and short rotation systems for the

improvement of soil fertility; tests to ascertain the adaptability and value of alfalfa for soiling and pasture; tests to determine the adaptability of kale as a winter succulent feed for dairy cows and other stock; experiments in breeding wheat for increase in both quantity and quality of yield, and improvement in adaptation to soil and climatic conditions of the Willamette Valley; experiments in testing the value of irrigation in Western Oregon for general farm crops; tests for comparing the merits of longanberries and phenomenal berries; variety tests of strawberries; experiments in cross pollination of apples; investigation of gummosis of the cherry; a study of the effects of the lime-sulphur spray under varying conditions; investigations of apple tree anthracnose, peach spot, potato blight, and celery leaf blight; investigations as to the relation of speed, the temperature, and the fat content of milk, to the cream produced by cream separators; co-operative investigations with the department of bacteriology relative to the best manner of using "cultures" in butter and cheese making; breeding for egg production; experiments in incubation to discover, if possible, the cause or causes of the great losses in artificial incubation; comparisons between hen-hatching and incubator-hatching; the humidity conditions of natural and artificial methods of incubation; carbonic acid gas as a factor in incubation; feeding experiments to determine the value of various forage crops and cereals for the growing and fattening of hogs; experiments in the feeding of dairy cows; experiments in grazing and fattening swine; investigations in the economical production of beef and mutton.

COLLEGE ORGANIZATIONS

One of the most important factors in rounding out the results and benefits of a college course is the society, club, or association work. Because of the diverse interests of college life and the varied tastes of the students, the following organizations are maintained by students and faculty:

THE STUDENT BODY ASSEMBLY. This is an organization of the entire student body, working under a constitution and by-laws approved by the faculty, and having general authority over all

student enterprises. In order to secure an effective administration of the business coming within its jurisdiction, there are permanent committees on athletics, publications, oratory and debate, and such special committees as the assembly may by vote determine. Officers are elected yearly, and nominations and elections are conducted in a manner similar to that of the State electorate.

STUDENT SELF-GOVERNMENT. A system of student self-government has been established at the College which places the general disciplinary powers of the institution in the hands of the students. The Student Council, an organization made up of thirteen students, seven of whom are seniors, three juniors, two sophomores and one freshman, has been created and vested with such powers as are necessary to enforce such rules and regulations as are adopted by the students. Members of the Student Council are elected annually by popular vote of the student body.

THE LITERARY SOCIETIES. These six organizations—Utopian, Clionian and Adelpheae, for women; and Zetagathian, Athenaeum, and Hesperian, for men—have the common purpose of promoting literary work among the students. The weekly literary programs and occasional joint meetings tend to this end. To stimulate interest in debate and oratory, there are held during the year inter-society, inter-collegiate and inter-state contests. Gold medals and cash prizes are presented to the winners in the contests, and the successful society in debate receives the "Gatch Cup." This is the silver cup that was presented in 1901 by Dr. Thomas M. Gatch, then president of the College, to the society that had received highest honors in the season's debates. Annually this cup is to go to the successful society in the debates, but it is ultimately to become the property of the society winning it three years in succession. Many and determined have been the battles for its possession, but the cup is still without a permanent home.

THE CHRISTIAN ASSOCIATIONS. The religious work of the College is well cared for by the Young Men's and Young Women's Christian Associations, these organizations being particularly strong. The construction of Shepard Hall, the new student building, has materially increased the scope and added to the effectiveness of the work. The Associations aim to provide a moral

atmosphere and pleasant social advantages for the students. Religious meetings are held in the rooms of these organizations every Sunday afternoon, and Bible study classes are regularly conducted. On registration days, committees are on hand to assist students in adjusting their work satisfactorily, and in securing comfortable quarters in good homes. Those who wish to make their way through College, will find the employment agencies always ready and glad to assist them as far as possible in procuring positions.

THE ATHLETIC ASSOCIATION. This organization, maintained by the students through the student body assembly, encourages wholesome competition in the various outdoor and indoor sports and pastimes. It has charge of all details pertaining to the conduct of intercollegiate athletics in which the College may be interested. A committee of the faculty has general supervision over the whole subject of athletics, thus insuring a sound and conservative management.

COLLEGE FOLK CLUB. This club was organized in October, 1908, and membership is open to all women of the faculty and other women employees of the institution, and to the women members of the immediate families of the faculty and other employees. The object of the club is social diversion, general culture, and the promotion of the best interests of the College. The organization at this time is divided into three sections: Art and Music Section, Sociology Section, and Mothers' Section. Aside from the semi-monthly meetings of the various sections, the general club convenes on the first Saturday of each month, at which time an address is given by an outside speaker, or a musical or literary program is furnished by members of the club, to which the public is invited. In January, 1913, the organization became affiliated with the Oregon State Federation of Women's Clubs. It is the purpose so to extend the work of the club as to effect the greatest possible good to the College and to the city.

THE MASK AND DAGGER. This club was organized for the purpose of offering special training in dramatic art. An annual "try out" is held in which all students of the institution may participate, and any who possess talent in this direction may be elected to

membership in the club. No student, however, will be permitted to take part in a public production who has not an average for all of his College work, at the time the play is being prepared, of 80 per cent. Platform exhibitions will be given and standard plays presented during the College year.

THE ORATORICAL ASSOCIATION. This body has immediate charge of all business pertaining to the competitive work in oratory and debate. Schedules, dates, prizes, conditions of competition and all similar matters are in its care.

INTERCOLLEGIATE DEBATE AND ORATORY. Each year the Oregon Agricultural College has at least one intercollegiate debate, putting into the field two teams, one supporting the negative and the other the affirmative of the same question. The College also sends one representative each year into the State Oratorical Contest in which eight colleges take part. Gold medals are awarded to the men who represent the College in these events.

LOCAL DEBATE AND ORATORY. There is held annually a local peace oratorical contest, to the winner of which the Cosmopolitan Club of the College presents a \$10 prize. There are also interclass contests in Declamation, Debate, Oratory, and Extempore Speaking, prizes being awarded by the Oratorical Association to the winners of these events. These latter contests are forensic events in the annual Interclass Forensic-Athletic Championship Contest, wherein the four classes compete for individual prizes and three loving cups—the Shakopean Cup, which becomes the permanent property of the highest individual forensic point-winner of the class winning the championship; the Orange O Cup, which becomes the property of the best athlete in that class, and the Barometer Cup which is held one year by the class winning the interclass championship.

THE SPHINX. This is the senior honor society. Membership is acquired by election based on prominence in student activities and scholastic excellence.

THE COSMOPOLITAN CLUB. This is an organization of foreign and American students. It is a local chapter of the Association of Cosmopolitan Clubs of the World. Its purpose is to provide social and educational advantages for its members and to promote

international friendship. At present, nine nations are represented in the local chapter.

THE AGRICULTURAL CLUB. This club was established for the purpose of advancing interest in the various phases of agriculture, and promoting the investigation and discussion of both general and special agricultural subjects. Suitable programs are prepared for each meeting, and whenever practicable, leading authorities on practical agriculture are engaged to address the members.

THE LEWELLING CLUB. This is the Horticultural Club conducted under the auspices of the Horticultural Department. There is no regular organization, except an executive committee, which has power to transact such business as requires action on the part of the club. It is open to all students interested in horticulture.

DELTA THETA SIGMA. There is established at the College a local chapter of this national honorary agricultural fraternity. The aim of the society is to advance the study of agricultural subjects by giving honorable recognition to students taking the lead in the work. Elections to membership are made by the members of the local chapter from the junior and senior classes.

THE FOREST CLUB. This is an association of students and instructors "formed for the purpose of promoting the forestry interests of the State." In order to carry out its purposes, it meets twice each month. The first meeting of each month is purely of a social nature, with each alternate meeting for the discussion of current forestry literature, magazine articles, news items, legislation, and general progress movements pertaining to forests, forest service, forest products, forest industries, lumbering, and the lumber trade.

THE CIVIL ENGINEERING CLUB. This is an organization within the department of Civil Engineering. The active membership is drawn from the junior and senior classes, and the privilege of associate membership is extended to the members of the two lower classes. It meets weekly for the discussion of subjects of interest to the civil engineer.

THE ELECTRICAL ENGINEERS. This is a College branch of the American Institute of Electrical Engineers. The aim of the organization is to discuss the topics contained in the monthly proceedings of the A. I. E. E., and in this way develop an intimate knowledge of the activities of the national organization, thereby coming into closer touch with the practical problems in the engineering world and becoming better fitted for their life work.

THE MINERS' ASSOCIATION. This body has for its object the discussion of technical engineering subjects; the review of current mining literature; the presentation of original papers by the active members; and occasional lectures on special mining topics by men outside of the College.

MECHANICAL ENGINEERS. This is a College branch of the American Society of Mechanical Engineers. The purpose of the association is to keep in touch with the practical problems of the engineering world.

SIGMA TAU. This is a local chapter of the national honorary engineering fraternity, chapters of which are at nearly all of the recognized technical schools of the United States. Membership in the fraternity is restricted to junior and senior students in Engineering and Forestry, election to membership being based principally upon scholastic excellence.

THE HOME ECONOMICS CLUB. This is an organization for the purpose of bringing all the women of the School of Domestic Science and Art into closer touch with one another than is possible without a central organization. The aim of the club is to give, by a series of monthly meetings, a general survey of Home Economics questions not covered in regular class-room work. The aim is carried out by means of well directed discussions and by securing outside lecturers who by virtue of their training and experience are considered authorities on subjects relating to Home Economics.

THE COMMERCIAL CLUB. This is a student organization within the School of Commerce. The purpose of the club is to bring its members into close relation with current methods and events in the commercial world. This is accomplished by discussions of topics pertaining to commerce by members of the club, and

by addresses at various times during the year by men prominent in the fields of law and business. Active membership is open to the juniors and seniors of the school, and associate membership may be enjoyed by the underclassmen.

THE PHARMACEUTICAL ASSOCIATION. The main purpose of this organization, which consists of the pharmacy students, is to bring its members into close relation with the current events of the pharmaceutical world. This is brought about by discussions in the meetings of topics pertaining to pharmacy, and by addresses at various times during the year by prominent pharmacists and salesmen of the State.

THE EASTERNERS' CLUB. Membership in the Easterners' Club is open to all student and faculty members who have at any time resided in those states situated east of the Mississippi River or in those provinces of Canada east of Manitoba. The objects of the club are to promote the interests of the College throughout the East, to encourage prospective students from the East and to offer social diversion to its members by providing occasions for the mingling of ideas on such current events as the sports, and politics, which are represented by the various states included within the membership.

THE EASTERN OREGON CLUB. This is an organization effected for the purpose of promoting the mutual interests of the College and the people of the eastern part of the State. Its members are afforded many social and intellectual advantages from the regular club meetings. Membership is open to all students from Eastern Oregon.

THE CALIFORNIA CLUB is, as the name implies, composed of students whose homes are in California. It is for the purpose of bringing "Californians" together socially that the club meets.

COLLEGE PUBLICATIONS

Two classes of publications are issued from the College; one, official, published by the College authorities; the other, unofficial, and published by the various student organizations.

The college publications include:

THE CATALOGUE. The General Catalogue is published at the close of the College year and contains much general and specific information as to the courses of study, equipment, and instruction, and gives a list of faculty members and students for the year.

THE ALUMNI DIRECTORY. This publication gives in each edition revised information as to the name, year of graduation, degree, present occupation and present address of each graduate of the College.

THE BULLETINS OF THE SUMMER SCHOOL. These announcements contain specific information of expenses, courses of instruction, character of the work presented, and the requirements that prospective students must meet.

THE BULLETINS OF THE WINTER SCHOOL. These announcements carry such information regarding the winter courses as may fully present the advantages of these courses to the public.

EXTENSION BULLETINS. These bulletins consist of monographs on the various phases of Agriculture, Domestic Science and Art, Engineering, Mining, and Commerce. They are written in such style as to be easily understood, thus meeting the popular demand for scientific knowledge and giving it in such form that the people of the State may profit by its application to the problems of everyday life.

THE STATION BULLETINS. These publications constitute a series of special reports upon experimental investigations in agronomy, horticulture, dairying, animal husbandry, poultry husbandry, insect pests, plant diseases, and special subjects of interest to the husbandman.

STUDENT PUBLICATIONS

The student publications comprise:

THE BAROMETER. In March, 1896, the literary societies of the College began the publication of a monthly periodical, the "O. A. C. Barometer." The enterprise has met with deserved success, and "the organ of the student body" is now issued as a four-page, five-column semi-weekly. It publishes the "news of the College," and is of general public importance as representing the interests, character and accomplishments of the student body of the College.

THE ORANGE. This is the annual publication of the junior class, and made its initial appearance in 1907. It is a high-class publication, bound in leather, and fully illustrated with photo-engravings, pen and ink sketches, line and wash drawings. It is a compendium of college life as seen by the juniors, brimful of wit, humor, sarcasm, sentiment and good will.

THE OREGON COUNTRYMAN. This is a monthly magazine published by the Agricultural and Domestic Science and Art students under the supervision of the faculties of these courses. Besides dealing with the work of the various departments in a practical manner, it contains articles of scientific value contributed by the Experiment Station workers. Successful men and women of the State contribute articles for each issue.

THE STUDENT ENGINEER. This is a magazine devoted to engineering and mechanic arts. Its purposes are to record the engineering progress in the Northwest; to furnish news; to discuss methods relating to the mechanic arts; to publish records of scientific work done by the students in this institution; and to publish any matter of special technical and scientific interest. Items of interest will be found for civil, mining, mechanical, and electrical engineers, and for others who are engaged in technical pursuits. The journal is under the supervision of the faculty of the School of Engineering and Mechanic Arts, but the work and responsibilities of the publication are borne by the staff, elected by the students of the School of Engineering.

THE C-P JOURNAL. This magazine, published monthly by the students of the Commerce and Pharmacy departments under the supervision of the faculty of the two schools, is devoted to the commercial and pharmaceutical interests of the school and State. Articles of merit are contributed for each issue by students, faculty and prominent business men of the State. One distinguishing feature of the C-P Journal is the publication each semester of a complete directory of all the students of the institution.

STUDENT EXPENSES

GENERAL FEES

Tuition is free to all students, regardless of the place of residence. The regular College fees required of all students, with the exception of special students in Music who take no other College courses, are as follows:

Entrance fee, payable annually on registration.....	\$5.00
Incidental (Student) fee, payable each semester.....	2.00
Diploma fee on graduation	5.00
Binding fee for graduation thesis	1.00
Entrance fee for Winter Short Courses	1.00

LABORATORY FEES AND DEPOSIT

Students are charged small fees in the different laboratory courses to cover the cost of material used; and deposits are required to cover cost of breakage in laboratory courses where breakages are likely to occur. These fees are payable at the beginning of each semester. At the end of the semester, deduction is made for actual breakage, and the balance of the deposit is refunded to the student. The fees and deposits charged each semester in the different courses are as follows:

AGRONOMY:	<i>Fees Deposits</i>	
Courses A, B, 101, 201, 501	\$.25	\$
Courses C, 202, 204, 205, 211, 301, 302, 303, 404, 502 .....	.50	
Course 505	1.00	
Courses 103, 111, 304, 311, 401, 402	1.00	1.00
Courses 102, 403, 411	1.00	2.00
Course 104	1.00	3.00
ANIMAL HUSBANDRY:		
Course 2	1.50	
Course 5 .....	.50	

ART AND ARCHITECTURE:

<i>Art</i> —Courses A, B, C, D, 101, 102, 103, 109, 110, 204, 305, 306, 407, 408, 409, 410, 411, 412.....	.50	
<i>Architecture</i> —Courses 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 516.....	1.00	
Courses 514, 515 .....	.75	

BACTERIOLOGY:

Course 401	1.50	
Courses 102, 201, 202, 203, 204, 205, 300, 301, 302, 402, 403, 501, 600	2.00	
Courses 111, 112, 502, 701	2.50	

BOTANY:

Courses A, 20, 21, 41, 60	1.00	
Courses 30, 31, 45, 70, 71, 100, 102, 104, 106, 110, 112, 115	1.50	
Courses 50, 51	2.50	1.50
Courses 82, 83 (per credit).....	.50	

CHEMISTRY:

Courses 100, 101, 102, 103, 200, 201, 300, 301, 400, 401, 402, 409, 500, 501, 502	3.00	2.00
Course 202	1.50	1.00

CIVIL ENGINEERING:

(See Engineering.)

COMMERCE:

Courses 100, 101, 102, 103	1.00	
Courses R, S, 400, 401, 402, 403, 404, 405	2.00	

DAIRY HUSBANDRY:

Courses A, 1, 2.....	1.00	2.00
Courses 10, 11, 15, 16.....	1.00	
Course C	5.00	3.00
Course 11 (Special Winter Course).....	1.00	2.00

DOMESTIC SCIENCE:

Course E .....	.50
Course 401	1.00
Course 190	2.00
Course 180	2.50
Courses A, B, C, D, 101, 102, 103.....	3.00
Courses 104, 105	3.50
Courses 201, 202	5.00

DOMESTIC ART:

Courses 101, 102, 103, 201, 202, 203, 204, 501, 502, 601, 701, 801, 802 .....	.50
Course 301	1.00
Courses 401, 402, 403, 404	3.00

ENGINEERING:

<i>Civil</i> —Courses 201, 203, 204, 206, 207, 211, 212, 213, 231, 236, 508	1.00	
Courses 101, 102, 103, 104, 301, 302, 303, 505, 506, 507 .....	.50	
<i>Electrical</i> —Courses 201, 202, 203, 204, 402.....	2.50	3.00
Courses 101, 102, 103, 105, 106, 108.....	.50	
<i>Experimental</i> —Courses 105, 106, 107, 108, 113, 123, 125, 128, 134	3.00	
Courses 124, 126, 127, 131, 141.....	2.00	
<i>Mining</i> —Courses 140, 142	1.00	
Courses 101, 102	3.00	
Courses 301, 342	7.50	
Course 220		2.00

FORESTRY:

Courses 201, 202, 203, 204, 303	1.00
Courses 501, 502	1.50

HORTICULTURE:

Courses 1, 12, 13, 17	1.00
Courses 3, 19, 54 .....	.50
Course 18	2.50

INDUSTRIAL ARTS:

Courses 101, 102, 103, 104, 105, 106, 130, 131.....	3.00	2.00
Courses 120, 140	3.00	

MECHANIC ARTS (Winter Course):

Woodwork	3.00	
Blacksmithing	3.00	

MINING ENGINEERING:

(See Engineering.)

PHARMACY:

Courses 111, 112, 151	5.00	1.00
Courses 160, 161	3.50	
Courses 130, 140 .....	.50	

PHYSICS:

Courses A, B, 111, 112, 212 .....	.75	
Courses 5, 6, 101, 102, 103, 104, 201, 202.....	1.50	

PHYSICAL EDUCATION:

All courses except those in Hygiene.....	1.50	
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(All students using Gymnasium pay the fee of \$1.50 per semester, for which they are given use of all equipment, baths, and are furnished with towels, soap, and medical supplies for injuries.)

SHOPWORK:

Courses A, B, C, D, E, F.....	5.00	2.00
Courses J. K. M. N.....	5.00	
Courses L, 122	2.00	
Courses 101, 102, 103, 104, 105, 111, 112, 113, 115, 116, 201, 203, 204	3.00	2.00
Courses G, 106, 114, 200, 202.....	2.00	2.00
Courses 120, 123, 130, 131	3.00	
Course 121	1.00	

VETERINARY SCIENCE:

Course 2 .....	.50	
Course 3 .....	.75	
Course 1	1.00	

ZOOLOGY:

Courses 101, 102, 103, 104, 105, 201, 202, 203, 204,	
205	1.00
Courses 301, 302, 304, 308, 309.....	.50

BOARD AND ROOM

Board and room accommodations may be had either in private families or in the College dormitories.

WOMEN'S DORMITORY. Waldo Hall, with its large airy parlors, halls, music and play rooms, is a pleasant residence for the young women who come from distant homes. The building is supplied throughout with pure mountain water, hot and cold in each room, electric lights, steam heat, and all modern conveniences. The rooms are furnished with an iron bedstead, a mattress, a chiffonier, a table, and chairs. Such other materials as are needed to make the furnishings complete, including pillows, pillow cases, sheets, blankets, bedspread, are furnished by the student; and many of the students prefer to make the rooms more homelike by bringing rugs, curtains, pictures, sofa cushions, etc. These latter articles, however, are not at all necessary. The rooms are cheerful and comfortable without additional furniture. The bedrooms average about 12 feet by 15 feet, with one window 3 feet by 7 feet. Many of the rooms are larger, and a few of them have two windows. Each student also furnishes her own towels and table napkins. Students who room together may choose to have a double bed or two single ones. Their preference must be indicated with application for a room. No definite promise for a single room can be made, the privilege of rooming alone depending upon the number of applications for rooms. The many advantages of having a room-mate should not be overlooked by the student in making her plans for college life.

The conditions of living in Waldo Hall are such that the College considers it a distinct advantage to the women students to live in the dormitory. A wholesome, busy, student atmosphere is maintained. Reasonable freedom is allowed, but week nights are reserved for study. All girls entering the College are expected

to live either in the dormitory or in homes selected by the Dean of Women, unless their parents reside in the city, or they are given special permission to live with relatives or friends who assume the responsibility of their care.

The expenses of living for each student in Waldo Hall are as follows:

Room deposit	\$ 3.00
Room rent per semester	
Single room	10.00
Double room	5.00
Board per week, payable monthly in advance.....	3.50
Incidentals, as laundry fee, electric iron fee, etc., per semester	2.00

The deposit is returned to the student at the close of the semester or school year, in case the room is maintained in a condition satisfactory to the Dean of women.

Young ladies wishing to reserve rooms should send the deposit to the Registrar, Corvallis, Oregon.

Students who are planning to enter the School of Domestic Science and Art, or to live in Waldo Hall, are asked to write to the Registrar for special circulars giving more detailed information than will be found in the Catalogue.

Waldo Hall will be open for students September 18, 1913.

Students who wish to arrive in Corvallis previous to the opening day should make arrangements to board and lodge in town until the morning of that date, when the Hall will be opened to receive them.

MEN'S DORMITORY. Cauthorn Hall, as a home for young men while in College, offers many inducements. There is room for about one hundred students. Accommodations in this Hall are similar to those described for the Women's Dormitory, each room being furnished with bedsteads, mattresses, chiffonier, table, and chairs. Students furnish bed clothing and other articles as desired. The Hall is conducted on the club plan, all business connected with the management of the club being in the immediate charge of a Manager and Steward elected by the members of the

organization. This plan has proved to be very popular and successful; so much so, that more than twice as many students have been turned away as it was possible for the Hall to accommodate. Applications for rooms in Cauthorn Hall should be made in person to the manager. The building, though having been in use for many years, is yet very substantial, and with the late improvements, is very comfortable. It is heated by steam and has hot and cold water on every floor, with all modern lavatory conveniences. The club rents the building from the College at the rate of \$5.00 per student per semester. The club purchases all the supplies in as large quantities as possible, and at the best possible advantage. The club also pays for all heating, lighting, and water supply. Each person pays his portion of the actual cost of living, which may be varied from time to time as the club wishes. The actual cost of living for the past year, including all expenses, is about \$18.00 per calendar month. Not only does the Hall afford a very comfortable home for young men while in College at minimum cost, but it is a place where friendships are formed which are never forgotten in after years.

PRIVATE BOARD. Board and room may be secured in private families in the city of Corvallis for from \$4.00 to \$5.50 per week. Good accommodations for self-boarding, or for club-boarding, can also be secured in the city. By clubbing, or renting rooms and boarding themselves, students materially reduce the cost of living. Students, however, will not be permitted to live at places not approved by the Faculty.

Lists of private boarding places can be secured from the Secretary of the Y. M. C. A. after the student arrives at the College.

PERSONAL EXPENSES

The personal expenses of students vary. Many students are able to go through the college year on a comparatively small amount. Books, including drawing instruments, will amount to between \$10 and \$25 per year. Each male student, immediately upon registration, is required to supply himself with a military uniform, the cost of which will be approximately as follows: Suit

and cap, \$15; tan shoes, \$3.25; leggings, \$1.00; hat band and breast cord, \$1.15; gloves, 25c per pair; total, \$20.65. The uniform is very serviceable and is more economical than civilian clothing. Women pursuing work in physical culture are required to provide themselves with a gymnasium suit, consisting of blouse-waist and bloomers of regulation style, and with the regulation gymnasium shoes. The cost of the suit, which should be purchased following consultation with the Physical Education Department after the student arrives at the College, will be about \$3.50. This suit should be serviceable for a number of years. The students in Domestic Science work provide themselves with cookery costume, consisting of dull blue dress, with white cap and apron. Students may make their own costumes, under the direction of the instructors in Domestic Art. The material will cost approximately \$5.00.

SELF-SUPPORT

A considerable number of students manage, in one way or another, to earn the whole or a part of their expenses while attending the College. Such opportunities occur in the line of office and laboratory assistance, personal services of numerous kinds, the management of various student enterprises, agencies for laundries, etc.

The Student Employment Bureau (in charge of the Christian Associations) registers without charge all students who apply for employment after they arrive at the College, and supplies employers with student labor as demanded. In general, the demand and supply are nearly equal, but the attention of new students who intend to earn the whole or part of their living is called to the following results of past experience:

1. There is a constant *over-supply* of those wishing to do teaching and clerical work. None but those having superior qualifications and experience are likely to secure employment the first semester.
2. There is a considerable demand for efficient stenographers; also for men and especially women students who can do domestic labor of any kind; board and room rent may be earned by table

service, dish washing, general housework, house cleaning, gardening, etc.

3. Students who can do any kind of domestic or manual labor well, and who have thoroughly good health, can earn their board by three hours' work per day, or board and room by four hours' work per day. *But no student should come to the College without resources sufficient for the expenses of one semester.* (See "Personal Expenses.")

4. No student should come expecting to earn money, who can do nothing well; skill is essential, as competition is quite as severe in the College community as elsewhere.

5. Opportunities for earning money during the summer vacations can usually be counted on, the demand for canvassers, horticultural, farm, and forestry laborers being most constant.

Upon arrival at the College, new students should report for information to the Information Bureau of the Christian Associations.

STUDENT LOAN FUND

Through the liberality of friends of the Oregon Agricultural College, a number of irreducible student loan funds have been established. The purpose, as expressed by one of the donors, is "not to induce students to attend school by providing money that can be easily obtained, but rather to aid those who have determined to secure an education and are paying the cost wholly or in part from their own earnings."

The funds so far provided are:

1. The R. A. Booth Fund of five hundred dollars, established by Senator R. A. Booth of Eugene. This loan fund is restricted to those studying—

(a) Agriculture in its various phases, with a view to becoming producers from the soil.

(b) Such branches of Mechanics as properly relate to Agriculture.

(c) Domestic Science.

2. The Ashby Pierce Fund of five hundred dollars, restricted to students in the Mechanical and Agricultural courses.

3. A fund of fifty dollars, established by the Philadelphian and Feronian Literary Societies of this institution.

4. The Clara H. Waldo Fund of fifty dollars, established by Mrs. Clara H. Waldo, of Portland.

5. A fund of ten dollars established by the Portland, Oregon, Chapter A, of P. E. O.

Great care is exercised in granting the loans. The student's character, standing, personal habits, and associations must be above reproach, to enable him to become a beneficiary of this fund. As a rule, the loans are secured and bear a reasonable rate of interest.

PRIZE FUND

THE CLARA H. WALDO PRIZE of one hundred dollars is an award annually made in the proportions of forty, thirty, twenty, and ten dollars respectively, to the woman of highest standing registered as a regular student in one of the degree courses in the senior, junior, sophomore, and freshman year. In the distribution of the prizes, the committee is guided by the following points:

- (a) Proficiency in literary and scholastic attainments.
- (b) Success in student activities.
- (c) Qualities of womanhood.
- (d) Qualities of leadership.

CONDITIONS OF ADMISSION

SECONDARY COURSES. To enter these courses, applicants must have completed the work required in the eighth grade of the public schools, and should have on file at the Registrar's office the eighth grade diploma not later than September 10, 1913. These courses are established for the benefit of persons who desire industrial training; but admission is limited to those students only who live in parts

of the State where no provision is made in the public schools for industrial work. The minimum age of those entering the Secondary courses in Agriculture, Forestry, Mechanic Arts, Domestic Science and Art, and Commerce, and the special winter courses in Agriculture, Mechanic Arts, and Domestic Science and Art, is fifteen years. Those entering as special students must be at least eighteen years of age. Good moral character is a requisite for admission.

DEGREE COURSES. For admission to the freshman class in any course in the college, the applicant must be at least sixteen years of age and must have completed all the subjects prescribed in the first and second years of the Oregon State High School Course, or their equivalent.

Applicants having completed the second year of the high school course, but without the required credit in plane geometry, may be admitted to the freshman class conditionally, being allowed to make up the deficiency in plane geometry by completing courses D and K.

Applicants who enter from the second year high school, but with one-half year's credit in plane geometry, will be conditioned in mathematics, being allowed to make up the deficiency by taking course K, five hours per week during the second semester, or the equivalent courses G and H, two and one-half hours per week throughout both semesters.

Applicants entering the freshman class of any of the engineering courses of the College, having had two years of high school work, but with no credit in plane geometry, will take courses D and E. Those having completed in the high school one-half year in plane geometry, will take course E. Those entering with full credit in plane geometry, but without solid geometry, will be required to take course F.

Students with advanced preparation, wishing to take the Engineering courses offered in the junior and senior years, must have completed the Calculus.

(After September 1, 1914, applicants must have completed the first three years of high school work, or its equivalent, before registering as freshmen at the College.)

ENTRANCE REQUIREMENTS

The following high school units are entrance requirements for admission to the freshman year: English 72 weeks, 2 units; Algebra 54 weeks, 1½ units; Plane Geometry 36 weeks, 1 unit; Electives 162 weeks, 4½ units.

A unit represents the work of thirty-six weeks with five recitations a week and forty-five minutes to the recitation. Certified certificates from high schools and academies will be accepted in lieu of entrance examinations. Students who have completed any of the Secondary industrial courses offered by the College may be admitted without examination to the corresponding degree courses. A statement of all high school work completed should be signed by the principal and forwarded to the Registrar, Corvallis, Oregon, not later than September 10, 1913. Special forms for this record may be secured from the Registrar.

ENGLISH. Admission to the English courses of the freshman year is by certification from accredited secondary schools. When an applicant cannot furnish such certification, his admission to the freshman courses is conditioned on his passing an examination in essentially the following tests:

1. To test his power of written expression, he will write one or more compositions on a subject, or on subjects, suggested by his personal, school, community, or literary interests.

2. To test his power of oral expression, he will read at sight, in the presence of the Examiner, passages of prose, or of poetry, or of both, with accuracy and effectiveness. He will also be expected to talk intelligently in good English, on some assigned subject adapted to his ability.

3. To test the range and character of his reading, and his power of appreciation, he will be expected to answer a number of simple questions on standard classics and contemporary literature not previously prescribed. He will also be expected to explain the meaning of several passages of prose and of poetry of moderate difficulty, selected from books not previously prescribed.

Whether the applicant be admitted by certification or by examination, the English department will, whenever it deems such a

course advisable, deal with the student as in a probationary relation.

In case the work of such student should, at the expiration of thirty days after matriculation, fail to conform to the standard set for creditable freshman work, he may be relegated to one of the Secondary courses.

Candidates presenting exercise books containing compositions or other written work properly certified to by the instructor, will be given credit for such work.

MATHEMATICS. For entrance into the freshman year, a thorough working knowledge of the following topics in Algebra is required: addition, subtraction, multiplication, and division of positive and negative numbers, use of parentheses, factoring, highest common factor, lowest common multiple, fractions, fractional and literal equations, simultaneous equations, problems involving linear equations with one or more unknown numbers, graphical representation of simultaneous linear and quadratic equations, involution, evolution, theory of exponents, radical expressions, imaginary numbers, quadratic equations, problems involving quadratic equations with one unknown number, equations in the quadratic form, factoring of quadratic equations, solution of quadratic equations by factoring, simultaneous quadratic equations, problems involving simultaneous quadratic equations with two unknown numbers.

The requirements in Plane Geometry are the five books of Wentworth's Plane Geometry, or of any other standard text on the subject. That the student may be trained to think for himself, and not be dependent upon the published proofs of the text, much importance is placed upon the proving of original exercises. It is strongly advised that students preparing for entrance examination in Geometry devote considerable time to the study of original exercises.

LIST OF ACCREDITED SCHOOLS

High Schools

Adams	Coburg
Airlie	Condon (County)
Albany	Coquille
Alpine	Corvallis
Alsea	Cottage Grove
Amity	Cove
Antelope	Crabtree
Applegate	Crawfordsville
Ashland	Creswell
Astoria	Crow
Athena	Dallas
Aumsville	Days Creek
Baker	Dayton
Ballston	Dee
Bandon	Dilley
Bay City	Dorena
Beaverton	Drain
Bend	Drewsey
Bonanza	Dufur
Brogan	Dundee
Brownsville	Echo
Buena Vista	Elgin
Burns (County)	Elmira
Butte Falls	Enterprise
Camas Valley	Estacada
Canyon City	Eugene
Canyonville	Falls City
Carlton	Florence
Cascade Locks	Forest Grove
Central Point	Fossil
Clackamas	Frankton
Clatskanie	Freewater

Ft. Klamath	Lebanon
Gardiner	Lexington
Gaston	Lorane
Gladstone	Lostine
Glendale	Madras
Gold Hill	Mapleton
Goshen	Marcola
Grants Pass	Marion
Grass Valley	Marshfield
Gresham	McCoy
Haines	McMinnville
Halsey	Medford
Harrisburg	Merrill
Heppner	Metolino
Hermiston	Milton
Hillsboro	Milwaukee
Hood River (District 2)	Molalla
Hood River (District 3)	Monmouth
Hubbard	Monroe
Huntington	Mosier
Imbler	Muddy Creek
Independence	Myrtle Creek
Ione	Myrtle Point
Irrigon	Nehalem
Irving	Newberg
Island City	Newport
Jacksonville	North Bend
Jefferson	North Powder
John Day	Nyssa
Joseph	Oakland
Junction	Ontario
Klamath Falls (County)	Oregon City
Klondike	Parkplace
Lafayette	Pendleton
La Grande	Perrydale
Laidlaw	Philomath
Lakeview	Phoenix

Pilot Rock	Sweet Home
Pleasant Hill	Talent
Portland	Tangent
Prairie City	The Dalles
Prineville (County)	Tillamook
Rainier	Toledo
Rickerall	Turner
Riddle	Tygh Valley
Rogue River	Umatilla
Roseburg	Union
Salem	Vale
Scappoose	Waldport
Scio	Walker
Scotts Mills	Wallowa
Seaside	Waltonville
Shaw	Wamic
Shedds	Wasco
Sheridan	Weston
Silverton	Wheeler
Springfield	Wilbur
St. Helens	Willamette
St. Johns	Willamina
Stanfield	Woodburn
Sumpter	Yamhill
Sutherlin	Yoncalla

Academies

Hill Military Academy	Portland Academy
Pendleton Academy	St. Helen's Hall

ADVANCED STANDING

Certificates of work completed in other institutions of recognized standing may be received in lieu of examinations for advanced standing, to the extent that such work is equivalent to the corresponding work required in the College courses. Applications for advanced standing, accompanied by a certified record of all High School and College work completed, and a statement of Honorable Dismissal, should be deposited with the Registrar not later than September 10, 1913.

SPECIAL STUDENTS

Persons eighteen years of age may be admitted as special students, provided they give satisfactory evidence of proper preparation for the studies desired, and have not already been admitted to the College, nor, having applied for admission, have been rejected. Special students may be allowed to graduate in any of the courses, on condition that they complete the required work and pass the necessary examinations.

Special students are expected to select their studies from courses open to freshmen. If they desire to take studies to which only advanced students are regularly admitted, they must show special preparation or special necessity for such courses.

Candidates applying for admission on the above basis should file with the Registrar before registration day a detailed statement of their preparatory work.

OPTIONAL STUDENTS

Applicants who meet all the entrance requirements may be admitted as optional students upon presenting satisfactory evidence that they are unable, because of poor health, or outside business, or professional duties, to take a full course. They should file with the Registrar, before registration day, a certified statement of all preparatory work.

REGISTRATION

All candidates for admission should file with the Registrar a certificate of their High School record on or before September 10, 1913. Blank forms for such record may be secured from the Registrar. Such candidates should present themselves for registration at the College on September 19, 1913. Registration at a later date will be permitted only on the presentation of a satisfactory reason for the delay. Students in all courses register at the beginning of the collegiate year for the work of the entire year. Credit for work not so registered, and changes in registration, will be allowed only by special permission of the College Council.

Students who have never before registered at the College are advised to reach Corvallis not later than September 18, 1913, in order that they may secure a boarding and rooming place before the first registration day.

GRADUATION

The degrees of Bachelor of Science in Agriculture, in Forestry, in Domestic Science and Art, in Civil Engineering, in Electrical Engineering, in Mechanical Engineering, in Mining Engineering, in Commerce, and in Pharmacy, are conferred upon those who have satisfactorily completed the respective four-year courses which in the aggregate comprise 152 credits of college work. A graduate in any of the courses may receive the bachelor's degree in any other course by completing the studies required in that course.

GRADUATE STUDY

This institution offers to its graduates and those of other institutions of equal rank, two-year courses leading to the degree of Master of Science and to the professional degrees of Civil Engineer, Electrical Engineer, Forestry Engineer, Mechanical Engineer, and Mining Engineer.

Between the time of granting the baccalaureate degree and these advanced degrees there shall intervene at least two years, of which the candidate shall devote not less than one year to resident study at this College.

In lieu of a second year's collegiate work the candidate, with the approval of the head of the department in which the major is taken, may offer one or more year's of acceptable work in a responsible technical or professional position. A responsible technical or professional position for this purpose is defined as one requiring the exercise of skill or executive ability, or both, in designing, construction, or operation.

Candidates for any of these degrees shall, within two weeks after the beginning of the first semester's resident work, file with the Committee on Advanced Degrees an application for the privilege of pursuing advanced study. This application shall specify the departments in which the major and minor subjects are to be taken, contain a detailed outline of the work to be done, and shall bear the approval of the heads of the several departments concerned.

Major subjects for the degree of Master of Science may be selected from the following departments: Agronomy, Animal Husbandry, Agricultural Chemistry, Bacteriology, Commerce, Dairy Husbandry, Domestic Science and Art, Horticulture, and Pharmacy; or from the following subjects: Economic Botany, Entomology, Economic Zoology, and Plant Pathology.

Major subjects for the degrees of Civil Engineer, Electrical Engineer, Mechanical Engineer, Mining Engineer, and Forestry Engineer must be selected from the departments of Civil Engineering, Electrical Engineering, Mechanical Engineering, Mining Engineering, or Forestry respectively.

The minor subjects may be selected from any of the above departments or from the departments of English, History, Mathematics, Chemistry, and Modern Languages.

Persons desirous of studying for advanced degrees shall select two lines of work, designated as major and minor subjects. The major subjects shall be research work, the results of which shall be incorporated in a thesis. The minor subjects shall be so selected as to support and strengthen the major.

The time factor in post graduate study contemplates forty hours per week of the student's time, not less than one-half of which shall be devoted to the major.

Candidates for advanced degrees shall present themselves for examination not later than ten days prior to Commencement.

Candidates for advanced degrees shall sustain final written and oral examinations in major and minor subjects by a special examining committee of the Faculty consisting of (1) the professor in charge of the major subject, (2) the one or more professors in charge of the minor subjects, and (3) the Committee on Advanced Degrees.

COURSES OF STUDY

The Oregon Agricultural College offers the following courses of study, each of which extends over four years, and leads to the degree of Bachelor of Science:

I. AGRICULTURE, offering major courses in—

- (a) Agricultural Chemistry;
- (b) Agronomy;
- (c) Animal Husbandry;
- (d) Bacteriology;
- (e) Dairy Husbandry;
- (f) Entomology;
- (g) Horticulture;
- (h) Plant Pathology;
- (i) Poultry Husbandry;
- (j) Agriculture for Teachers.

II. FORESTRY.

III. DOMESTIC SCIENCE AND ART, offering major courses in—

- (a) Domestic Science;
- (b) Domestic Art.

IV. ENGINEERING, offering major courses in—

- (a) Civil Engineering;
- (b) Electrical Engineering;
- (c) Mechanical Engineering;
- (d) Mining Engineering.

V. COMMERCE.

VI. PHARMACY.

VII. INDUSTRIAL ARTS.

In addition to the above courses, provision has been made for the following secondary courses; each of which extends over two years:

- A. Agriculture.
- B. Forestry.
- C. Mechanic Arts.
- D. Domestic Science and Art.
- E. Commerce.

There is also a half-year course in Dairying and a special two-year course in Pharmacy.

During the year there are also offered the following short courses: A four-week winter course in Agronomy, Animal Husbandry, Horticulture, Dairying, Forest Rangers, Domestic Science and Art; Farmers' Week; a six-week Summer School; and a special six-week course in Cookery.

SCHOOL OF AGRICULTURE

The School of Agriculture offers a two-year course in secondary Agriculture; nine four-year courses, each of which leads to the degree of Bachelor of Science; a half-year course in Dairying; a four-week Winter course in Agronomy; a four-week Winter course in Animal Husbandry; a four-week Winter course in Dairying; a four-week Winter course in Horticulture; and a Farmers' Week.

The Two-Year Course, known as the Secondary Course, is provided especially for those who have had no opportunity to pursue their public school course beyond the eighth grade, or who from necessity or choice desire, upon completing the work of this grade, to obtain as quickly as possible a working knowledge of the principles of agricultural science and practice. The technical instruction given during the course includes courses in Agronomy, Animal Husbandry, Horticulture, Dairy Husbandry, Botany, Physiography, Business Administration, Drawing, Woodwork, and Blacksmithing. Courses in English, Mathematics, and History are provided so that students who finish these subjects and who so desire, will be fully prepared to enter upon the degree courses.

THE DEGREE COURSES. Students who have completed any of the secondary courses at this institution may register in the degree courses without conditions. Those who have completed the second year of the Oregon State High School course are entitled to register as freshmen. (See "Conditions of Admission.") Graduates of a good four-year high school course are often able to finish this course in three years.

The various subjects of instruction may be conveniently arranged into three groups, each of which requires approximately

one-third of the student's time: (a) Sciences related to Agriculture, *i. e.*, Botany, Zoology, and Entomology, Chemistry, Physics, and Bacteriology; (b) Technical Agricultural subjects, *i. e.*, Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, Poultry Husbandry, and Veterinary Science; (c) non-technical subjects, *i. e.*, English Language and Literature, Mathematics, History, Modern Languages, Drawing, Political Science, Rural Economy, Rural Sociology, and similar subjects.

The subjects of the first group are designed to furnish the student with an insight into the principles of agricultural science. Those of the second group teach him the application of these principles and give him also, both theoretically and practically, various subjects of agricultural technology. The subjects of the third group tend further to develop the student's intellect, broaden his view, and train him in good citizenship.

To indicate briefly the nature of the work, it may be stated that in the courses in Agronomy, the student studies the origin, structure, fertility, cultivation and improvement of various soils; the history, growth, culture, improvement and value of the different field crops; the structures, machinery, drainage and irrigation of the farm; and the history, economics, methods, and business principles in farm management. Thorough courses in Business Administration, Rural Economy and Sociology, and Political Science for Agricultural students are given by the School of Commerce. In the course in Animal Husbandry, consideration is given to the history and characteristics of the various breeds of livestock; the principles of breeding; the principles and practice of feeding with particular reference to conditions in this State. By constant practice in stock judging, the student is made familiar with the good points of the various breeds. In Horticulture the student studies the problems of the orchard and garden, such as choice of sites, soils, planting, pruning, choice of varieties, sprays and spraying, and thinning; he obtains instruction and practice in the propagation of plants by various methods; in the harvesting, packing, storage and marketing of fruits; he may study the principles of plant breeding or the construction and management of greenhouses or the culture of small fruits and vegetables for market or canning

purposes. In Dairy Husbandry he studies the secretion, composition, and separation of milk and cream; and obtains abundant practice in the use of the Babcock and other tests, in butter and cheese making, and in creamery practice. A Department of Poultry Husbandry offers to students exceptional opportunities to specialize in this line. The instruction will include a study of breeds, the principles of feeding, housing and incubation, and will be supplemented by practical work on the farm. In Veterinary Science the student is taught to prevent disease, diagnose existing pathological conditions, arrest outbreaks of contagious and infectious diseases among domestic animals, give medical attention in emergency cases, and take care of the sick.

In response to the demand for special teachers of Agriculture in the high schools, an opportunity is given students to major in agricultural education. Certain courses are prescribed in the Junior and Senior years to broaden the general agricultural training of the first two years, so that the teacher may be prepared to meet the conditions in any section of the State. Courses in Pedagogy provide the necessary principles and methods of teaching. Some election is also allowed in order that the student may specialize along the lines of his greatest interest.

The aim of the two and four-year courses is to train young men to become successful farmers, stockmen and fruit growers; to prepare them to become specialists in some branch of agricultural college or experiment station work; to fit them to become teachers of agriculture in the public schools. In short, they offer to those who have faith in the farm and in rural life, opportunities for intellectual development and technical training equal to those provided for the educated in other professions.

THE FOUR-WEEK WINTER COURSES. The Four-Week Winter courses are designed for special purposes, and it is the aim in each to furnish the greatest amount of special information in the least possible time. They are provided especially for those who desire technical information in some particular phase of agriculture, but have not the time nor the opportunity to pursue any of the degree courses.

Secondary Course in Agriculture

FIRST YEAR

	<i>Semester</i>	
	1st.	2nd.
Advanced Grammar (English A, B).....	4	3
Elements of Literature (English C, D).....	1	2
Algebra (Math. A, B).....	5	5
Ancient History (Hist. A).....	3	
Mediæval and Modern History (Hist. B).....		3
Drawing (Art. A, C).....	2	2
Soils (Agron. A).....	2	
Crops (Agron. B).....		3
Stock Judging (An. Hus. A).....	2	
Elementary Orchard Practice (Hort. A).....	2	
Elementary Orchard Practice and Vegetable Garden- ing (Hort. B).....		3
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	21	21

SECOND YEAR

Rhetoric and Composition (English E, F).....	3	3
Elements of Literature (English G, H).....	2	2
Algebra, Plane Geometry (Math. C, D, K).....	5	5
Accounting and Business Methods (Com. E).....	2	
Commercial Law (Com. L).....		2
Principles of Dairying (Dairy Hus. A).....	2	
Elementary Farm Mechanics (Agron. C).....	2	
Veterinary Science (Vet. Sci. B).....		2
Bacteriology (Bact. A).....		2
Practical Stock Feeding (An. Hus. C).....		3
Physiography A.....	3	
Woodwork (Shop. G).....	2	
Blacksmithing (Shop. L).....		2
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	21	21

One Semester Course in Dairying

FIRST SEMESTER

Dairy Methods (Dairy Hus. B).....	5
Dairy Practice (Dairy Hus. C).....	4
Dairy Bacteriology (Bact. 403).....	3
Basic Agronomy (Agron. 101).....	3
Stock Judging (An. Hus. A).....	2
Business Methods (Com. E).....	2
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	19

Degree Course in Agriculture

FRESHMAN YEAR

	<i>Semester</i>	
	1st.	2nd.
Rhetoric (English 31, 32).....	3	3
Elements of Literature (English 41, 42).....	2	2
General Chemistry (Chem. 100, 101).....	4	4
Agricultural Physics (Physics 111, 112).....	3	3
Principles of Botany (Bot. 20, 21).....	3	3
Basic Agronomy (Agron. 101).....	3	
Crop Production (Agron. 201).....		3
Stock Judging (An. Hus. 1).....	2	
Woodwork (Shop 106).....		2
Library Practice (Libr. 1).....	1	
Hygiene (Phys. Ed. 19).....		1
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	21	21

SOPHOMORE YEAR

French, German, Spanish (Mod. Lang. 101, 102, 201, 202, 301, 302) or		
Modern English Prose (English 81, 82).....	3	3
Rural Economics (Com. 219).....	3	
Agricultural Botany (Bot. 41).....		3

Principles of Economic Zoology (Zool. 108, 109).....	5	4
Elementary Bacteriology (Bact. 101).....	3	
Agricultural Chemistry (Chem. 500, 501).....	4	4
Orchard and Garden Practice (Hort. 2).....	3	
Plant Propagation (Hort. 1).....		2
Farm Dairying (Dairy Hus. 1).....		3
Live Stock Management (An. Hus. 2).....		2
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	21	21

JUNIOR YEAR

Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Major Electives	7	7
Minor Electives	5	5
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
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	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Major Electives	8	8
Minor Electives	6	6
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
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	17	17

As indicated by the outlines above, all candidates for a degree of Bachelor of Science in Agriculture will pursue the same studies during the first two years of the course, in order that each may become well grounded in the fundamentals of agricultural science and practice. During the remaining two years of his course each student will be given an opportunity to become proficient in some one branch of Agriculture by specializing in one of the following groups of studies, viz.: Agronomy, Animal Husbandry, Dairy

Husbandry, Poultry Husbandry, Horticulture, Agricultural Chemistry, Agricultural Bacteriology, Plant Pathology and Entomology, or Agriculture for Teachers. All students working for degrees will be required to carry at least seventeen credits through the junior and senior years. Subjects other than those prescribed in the various groups must be selected with the advice of the head of the department in which the major is taken. Minors may be selected from any of the above departments, or from the Departments of English, Mathematics, Physics, Commerce, Industrial Pedagogy, Civil Engineering, including Highway Construction, Architecture, or Forestry.

COURSES IN AGRONOMY

(a) Regular

JUNIOR YEAR	Semester	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
French, German or Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Drainage and Irrigation (Agron. 301).....		3
Cereal Crops (Agron. 202).....	5	
Soil Physics (Agron. 102).....		5
Farm Mechanics (Agron. 401).....	3	
Farm Power Machinery (Agron. 402).....		3
Seminar (Agron. 503).....		1
Electives	4	
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
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	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking Eng. 103, 104)	2	2
Soil Fertility (Agron. 104).....	5	
Farm Management (Agron. 505).....		5

Agrostology (Agron. 205).....	5	
Crop Improvement (Agron. 204).....		3
Seminar (Agron. 504).....		1
Electives	4	5
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
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	17	17

(b) Soils

JUNIOR YEAR	Semester	
	1st.	2nd.
French, German or Spanish (Mod. Lang.) 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Agricultural Bacteriology (Bact. 501).....	3	
Forage Crops (Agron. 203).....	2	
Cereal Crops (Agron. 202, lect. only).....	3	
Weed Eradication (Agron. 501).....	1	
Electives	3	
Drainage and Irrigation (Agron. 301).....		3
Soil Chemistry (Chem. 503).....		3
Soil Physics (Agron. 102).....		5
Seminar (Agron. 503).....		1
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
Argumentative Themes, Presentation (Eng. 100, 101).....	1	1
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	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
Agricultural Geology (Min. Eng. 141).....	3	
Feeds and Feeding (A. H. 23).....	3	
Soil Fertility (Agron. 104).....	5	
Elective	3	1

Crop Improvement (Agron. 204).....	3
Dry Farming (Agron. 502).....	3
Farm Management (Agron. 505).....	3
Advanced Soils (Agron. 111).....	3
Seminar (Agron. 504)	1

(c) Crops	17	17
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JUNIOR YEAR

French, German, Spanish (Mod. Lang.) 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
Agricultural Bacteriology (Bact. 501).....	3	
Taxonomy of Weeds and Grasses (Bot. 45).....	2	
Field Crop Diseases (Bot. 103).....	2	
Cereal Crops (Agron. 202).....	5	
Weed Eradication (Agron. 501)	1	
Drainage and Irrigation (Agron. 301).....		3
Crop Improvement (Agron. 204).....		3
Field Crop Pests (Ent. 304)		2
Soil Physics (Agron. 102).....		5
Seminar (Agron. 503).....		1
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1

SENIOR YEAR	18	19
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Composition of Addresses, Extempore Speaking (Eng. 103, 104).....	2	2
Agrostology (Agron. 205).....	5	
Feeds and Feeding (A. H. 23).....	3	
Soil Fertility (Agron. 104).....	5	
Elective	1	
Dairy Herd Management (D. H. 7).....		3
Dry Farming (Agron. 502).....		3
Farm Management (Agron. 505).....		3
Advanced Crop Breeding (Agron. 206).....		3
Advanced Crops (Agron. 211).....		3

Seminar (Agron. 504).....		1
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
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(d) Irrigation Farming	17	19

SOPHOMORE YEAR.

For Rural Economics (Com. 219, three credits first semester), in the regular Agricultural course, substitute Trigonometry (Math. 11, three credits first semester).

For Agricultural Botany (Bot. 41, three credits second semester), substitute Plane Surveying (C. E. 231, three credits, second semester).

JUNIOR YEAR.

French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
Farm Mechanics (Agron. 401).....	3	
Climatology (Agron. 303).....	1	
Topographic Surveying (C. E. 236).....	3	
Forage Crops (Agron. 203).....	2	
Irrigation Farming (Agron. 302).....	3	
Drainage and Irrigation (Agron 301).....		3
Farm Power Machinery (Agron. 402).....		3
Soil Physics (Agron. 102).....		5
Seminar (Agron. 503).....		1
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
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SENIOR YEAR

	17	17
Composition of Addresses, Extempore Speaking (Eng. 103, 104).....	2	2
Hydraulics (C. E. 351).....	3	
Feeds and Feeding (A. H. 9).....	3	
Soil Fertility (Agron. 104)	5	
Advanced Irrigation Farming (Agron. 311).....	3	
Crop Improvement (Agron. 204).....		3
Dairy Herd Management (D. H. 7)		3

Semester
1st. 2nd.

Dry Farming (Agron. 502).....		3
Farm Management (Agron. 505).....		3
Seminar (Agron. 504).....		1
Elective		1
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
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	17	17

COURSE IN ANIMAL HUSBANDRY

JUNIOR YEAR

Argumentative Themes, Presentation (Eng. 101, 102) 1	1
Constitutional Law and Politics (Com. 320).....	3
State and Municipal Government (Com. 322).....	3
Breeds of Stocks (An. Hus. 3, 4).....	4
Livestock Marketing (An. Hus. 5).....	3
Soil Physics (Agron. 102).....	5
Forage Crops (Agron. 203).....	2
Comparative Anatomy (Vet. Sci. 1).....	3
Veterinary Physiology (Vet. Sci. 2).....	3
Theoretical Instruction (Mil. Sci. 1, 2).....	1
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	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104).....	2
Commerical Law (Com. 300, 301).....	3
Materia Medica and Comparative Medicine (Vet. Sci. 3)	3
Surgery (Vet. Sci. 4).....	3
Principles of Feeding (An. Hus. 7).....	2
Advanced Stock Judging (An. Hus. 16, 17).....	2
Principles of Breeding (An. Hus. 6).....	3
Feeds and Feeding (An. Hus. 21).....	5
Seminar (An. Hus. 18, 19).....	1
Theoretical Instruction (Mil. Sci. 3, 4).....	1
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	17

COURSES IN DAIRY HUSBANDRY

(a) Milk Production

	JUNIOR YEAR	
	<i>Semester</i> 1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)	1	1
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or Constitutional Law and Politics (Com. 320) State and Municipal Government (Com. 322)	3	3
Dairy Inspection (Dairy Hus. 2)	2	
Dairy Farm Equipment (Dairy Hus. 4)		3
Breeds of Dairy Cattle (Dairy Hus. 3)	3	
Veterinary Physiology (Vet. Sci. 2)		3
Principles of Feeding (An. Hus. 7)	2	
Forage Crops (Agron 203)	2	
Drainage and Irrigation (Agron. 301)		3
Electives	3	3
Theoretical Instruction (Mil. Sci. 1, 2)	1	1
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	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
City Milk Supply (Dairy Hus. 5)		2
Dairy Herd Management (Dairy Hus. 7)		3
Seminar (Dairy Hus. 6)		1
Principles of Breeding (An. Hus. 6)	5	
Materia Medica and Comparative Medicine (Vet. Sci. 3)	3	
Dairy Bacteriology (Bact. 401, 402)	3	2
Electives	3	6
Theoretical Instruction (Mil. Sci. 3, 4)	1	1
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	17	17

(b) Dairy Manufactures**JUNIOR YEAR**

	<i>Semester</i>	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Butter Making (Dairy Hus. 10).....	5	
Dairy Inspection (Dairy Hus. 2).....	2	
Cheese Making (Dairy Hus. 11).....		3
Dairy Chemistry (Chem. 502)		3
Forage Crops (Agron. 203).....	2	
Drainage and Irrigation (Agron. 301).....		3
Electives	3	3
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Dairy Machinery (Dairy Hus. 12).....	2	
Factory Management (Dairy Hus. 13).....	3	
Technology of Milk (Dairy Hus. 14).....		2
Dairy Herd Management (Dairy Hus. 7).....		3
Ice Cream and Ices (Dairy Hus. 15).....		1
Dairy Bacteriology (Bact. 401, 402).....	3	2
Seminar (Dairy Hus. 6)		1
Electives	6	5
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
	17	17

COURSES IN HORTICULTURE

(a) Pomology

JUNIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Floriculture (Hort. 3)	2	
Landscape Gardening (Hort. 4).....		2
Orchard Practice (Hort. 12, 13).....	2	2
Practical Pomology (Hort. 11)	3	
Introductory Entomology (Zool. 301).....	3	
Entomology of Orchards and Small Fruits (Zool. 302)....		3
Electives	2	5
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	—	—
	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Seminar (Hort. 20, 21).....	1	1
Systematic Pomology (Hort. 18)	3	
Commercial Pomology (Hort. 19)	2	
Principles of Plant Pathology (Bot. 100).....	3	
Diseases of Trees and Small Fruits (Bot. 102).....		3
Electives	2	5
Plant Physiology (Bot. 50, 51).....	3	3
History and Literature of Horticulture (Hort. 32).....		2
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
	—	—
	17	17

(b) Olericulture

JUNIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Floriculture (Hort. 3)	2	
Landscape Gardening (Hort. 4)		2
Principles of Vegetable Gardening (Hort. 31).....	2	
Practical Vegetable Growing (Hort. 37)		3
Plant Breeding (Hort. 23)	3	
Introductory Entomology (Zool. 301)	3	
Entomology of Truck and Field Crops (Zool. 303).....		3
Electives	2	4
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	—	—
	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Forcing Vegetables (Hort. 32, 33)	2	2
Commercial Truck Gardening (Hort. 35, 36).....	3	3
Seminar (Hort. 20, 21)	1	1
Systematic Olericulture (Hort. 34).....	1	
Principles of Plant Pathology (Bot. 100).....	3	
Diseases of Vegetable Crops (Bot. 104).....		3
Advanced Plant Breeding (Hort. 24).....		3
Electives	4	2
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
	—	—
	17	17

(c) Floriculture

JUNIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Annuals and Perennials (Hort. 41, 42).....	3	3
Floriculture (Hort. 3).....	2	
Greenhouse Construction (Hort. 51).....		3
Landscape Gardening (Hort. 4).....		2
Introductory Entomology (Zool. 301).....	3	
Entomology of Truck and Field Crops (Zool. 303).....		3
Electives	4	1
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	—	—
	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Forcing Flowers (Hort. 52, 53).....	3	3
Agricultural Bacteriology (Bact. 501).....	2	
Forcing Vegetables (Hort. 32).....		2
Advanced Plant Breeding (Hort. 24).....		3
History and Literature of Horticulture (Hort. 22).....	2	
Principles of Plant Pathology (Bot. 100).....	3	
Diseases of Vegetable Crops (Bot. 104).....		3
Electives	4	3
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
	—	—
	17	17

(d) Landscape Gardening

FRESHMAN YEAR

	<i>Semester</i>	
	1st	2nd
Rhetoric (Eng. 31, 32).....	3	3
Elements of Literature (Eng. 41, 42).....	2	2
Agricultural Physics (Phys. 111, 112).....	3	3
Principles of Botany (Bot. 20, 21).....	3	3
Woodwork (Shop 106).....	2	
Library Practice (Libr. 1)	1	
Plane Trigonometry (Math. 12).....	3	
Plane Surveying (C. E. 201).....		5
Architectural Drawing (Arch. 501).....	4	
Orders (Arch. 502).....		4
Hygiene (Phys. Ed. 19).....		1
	—	—
	21	21

SOPHOMORE YEAR

French (Mod. Lang. 101, 102).....	3	3
Modern English Prose (Eng. 81, 82).....	3	3
Agricultural Botany (Bot. 41)		3
General Zoology (Zool. 101, 102).....	3	3
Elementary Bacteriology (Bact. 101).....	3	
Orchard and Garden Practice (Hort. 2).....	3	
Plant Propagation (Hort. 1).....		2
Topographic Surveying (C. E. 204).....	5	
Railroad Surveying (C. E. 211).....		5
Silviculture (For. 202)		2
Business Contracts	1	
	—	—
	21	21

JUNIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
State and Municipal Government (Com. 322).....		3
Tree Surgery (Hort. 39, 40).....	1	1
Floriculture (Hort. 3).....	2	
Landscape Gardening (Hort. 4).....		2
Roads and Pavements (C. E. 401).....	3	
French (Mod. Lang. 103, 104).....	3	3
Plant Materials (Hort. 43, 44).....	3	3
Pen and Pencil Rendering (Arch. 503, 504).....	2	2
Water Color Rendering (Arch. 505, 506).....	1	1
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	—	—
	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Theory and Design (Hort. 45, 46).....	2	3
Field Practice (Hort. 47, 48).....	3	3
Principles of Plant Pathology (Bot. 100).....	3	
Diseases of Trees and Small Fruits (Bot. 102).....		3
History and Literature of Landscape Architecture (Hort. 49)		2
Town Planning (Hort. 50).....	3	
Electives	3	3
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
	—	—
	17	17

COURSE IN POULTRY HUSBANDRY

JUNIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Poultry Husbandry (Poultry Hus. 1, 2).....	4	4
Embryology and Histology (Zool. 104, 105).....	3	3
Elementary Laboratory Bacteriology (Bact. 102).....		2
Markets and Marketing (Poultry Hus. 7).....	2	
Feeds and Feeding (Poultry Hus. 10).....		2
Electives	3	1
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	—	—
	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Advanced Poultry Husbandry (Poultry Hus. 3, 4).....	4	9
Farm Management (Agron. 505).....		3
Principles of Breeding (An. Hus. 6).....	5	
Minor Electives.....	2	2
Poultry Diseases (Bacteriology 701).....	3	
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
	—	—
	17	17

COURSE IN AGRICULTURAL CHEMISTRY

JUNIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
French, German or Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Soil Chemistry (Chem. 503, 504)	4	4
Agricultural Geology (Min. 141).....	3	
Soil Physics (Agron. 102)		3
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
Electives	5	5
	—	—
	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Advanced Agricultural Analysis (Chem. 507, 508).....	4	4
Plant Physiology (Bot. 50) or		
Principles of Plant Pathology (Bot. 100) or		
Agricultural Bacteriology (Bact. 501)	3	
Advanced Agronomy (Agron. 403)		3
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
Electives	7	7
	—	—
	17	17

COURSE IN AGRICULTURAL BACTERIOLOGY

	JUNIOR YEAR		<i>Semester</i>	
	1st.	2nd.		
Argumentative Themes, Presentation (Eng. 101, 102)	1	1		
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304).....	3	3		
Major Bacteriology (Bact. 111, 112).....	5	5		
Electives (Chem., Agron., Zool., or Vet. Sci.).....	7	7		
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1		
	—	—		
	17	17		

SENIOR YEAR

Composition of Addresses Extempore Speaking (Eng. 103, 104).....	2	2		
Bacteriology, Research (Bact. 116).....	8	8		
Electives (Chem., Agron., Zool., or Vet. Sci.).....	6	6		
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1		
	—	—		
	17	17		

COURSE IN PLANT PATHOLOGY

	JUNIOR YEAR		<i>Semester</i>	
	1st.	2nd.		
Argumentative Themes, Presentation (Eng. 101, 102).....	1	1		
French, German Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or				
Constitutional Law and Politics (Com. 320).....	3			
State and Municipal Government (Com. 322).....		3		
Principles of Plant Pathology (Bot. 100).....	3			
Diseases of Trees and Small Fruits (Bot. 102).....		3		
Plant Physiology (Bot. 50, 51).....	3	3		
General Bacteriology (Bact. 111).....	5			
Phyto-Pathological Technique (Bot. 110).....		3		
Electives	1	3		
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1		
	—	—		
	17	17		

SENIOR YEAR

	Semester	
	1st.	2nd.
Composition of Addresses Extempore Speaking (Eng 103, 104).....	2	2
Forest Botany (Bot. 3).....	3	
Phyto-Pathological Histology (Bot. 112)		3
Advanced Taxonomy of Parasitic Fungi (Bot. 115).....	3	
Diseases of Vegetable Crops (Bot. 104) or Forest Pathology (Bot. 106).....		3
Introduction Entomology (Zool. 301).....	3	
Thesis (Bot. 82, 83).....	3	3
Entomology of Orchard and Small Fruits (Zool. 302).....		3
Electives	2	2
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
	—	—
	17	17

COURSE IN ENTOMOLOGY

JUNIOR YEAR

Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or State and Municipal Government (Com. 320).....		3
Constitutional Law and Politics (Com. 322).....	3	
Introductory Entomology (Zool. 301).....	5	
Advanced Entomology (Zool. 305).....		5
Principles of Plant Pathology (Bot. 100).....	3	
Diseases of Trees and Small Fruits (Bot. 102).....		3
Practical Pomology (Hort. 11).....	3	
Plant Breeding (Hort. 23).....		3
Beekeeping (Zool. 309).....		1
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
Elective	1	
	—	—
	17	17

SENIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Composition of Address, Extempore Speaking (Eng. 103, 104)	2	2
Advanced Entomology (Zool. 306, 307)	5	5
Orchard Practice (Hort. 12, 13)	2	2
Embryology (Zool. 104)	3	
Histology (Zool. 105)		3
Electives	4	4
Theoretical Instruction (Mil. Sci. 3, 4)	1	1
	—	—
	17	17

COURSE IN AGRICULTURE FOR TEACHERS

JUNIOR YEAR

Argumentative Themes, Presentation (Eng. 101, 102,)....	1	1
French, German, or Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Theoretical Instruction (Mil. Sci. 1, 2)	1	1
General Psychology (Ind. Ped. 101)	3	
General Method (Ind. Ped. 140)		3
Practical Pomology (Hort. 11)	3	
Soil Physics (Agron. 102)		3
Introductory Entomology (Zool. 301)	3	
Practical Vegetable Gardening (Hort. 37)		3
Electives	3	3
	—	—
	17	17

SENIOR YEAR

	Semester	
	1st.	2nd.
Composition of Address, Extempore Speaking (Eng. 103, 104)	2	2
Theoretical Instruction (Mil. Sci. 3, 4)	1	1
Special Methods in Agriculture (Ind. Ped. 150, 151)	3	3
Soil Fertility (Agron. 104)	5	
Farm Management (Agron. 401)		3
Landscape Gardening (Hort. 4)		2
Dairy Herd Management (D. H. 7)		3
Poultry Husbandry (P. H. 6)	2	
Electives	4	3
	—	—
	17	17

COURSES IN FORESTRY

Nature has created conditions which have made Oregon one of the best timber growing States in the Union. At present it carries at least one-fifth of the standing timber in the United States—a stumpage estimated at more than four hundred billion feet, board measure. This immense property represents a resource second in value only to agriculture.

The College can best serve the timber owners by preparing men to assist in this great industry. Realizing this need, the Forestry course has been largely shaped to this end. The student is thoroughly trained in plane and topographic surveying and map making. He is required to apply his theory to actual practice in the woods, surveying and mapping timber lands, cruising timber and studying and planning logging operations.

To meet all the needs of the State in protection, development, and harvesting of its forest resources, the College has provided a regular four-year course of instruction, in charge of professional foresters. While the course aims to give the student the maximum amount of technical instruction possible, full cognizance is taken of the fact that the forester should be fully prepared for broad citizenship.

Secondary Course in Forestry

FIRST YEAR

Semester

1st. 2nd.

Advanced Grammar (English A, B).....	4	2
Elements of Literature (English C, D).....	1	3
Algebra (Math. A, B).....	5	5
Ancient History (Hist. A).....	3	
Mediaeval and Modern History (Hist. B).....		3
Elementary Drawing (Art. A).....	2	
Scientific Drawing (Art. C).....		2
Farm Accounting and Business Methods (Com. E).....	2	
Elementary Commercial Law (Com. L).....		2
Elementary Forestry (For. A, B).....	4	4
	—	—
	21	21

SECOND YEAR

Rhetoric and Composition (English E, F).....	3	3
Elements of Literature (English G, H).....	2	2
Algebra, Plane Geometry (Math. C, D, K).....	5	5
Silviculture (For. C, D).....	2	2
Business English (English 21).....		3
Woodwork (Shop. G).....	2	
Blacksmithing (Shop L.).....		2
United States History (Hist. 20).....	3	
Elementary Physics (Phys. A, B).....	4	4
	—	—
	21	21

Degree Course in Forestry

FRESHMAN YEAR

	<i>Semester</i>	
	1st.	2nd.
Rhetoric (English 31, 32).....	3	3
Elements of Literature (English 41, 42).....	2	2
Trigonometry (Math. 12).....	3	
Mechanical Drawing (M. E. 101).....	2	
Plane Surveying (C. E. 201).....		5
General Chemistry (Chem. 100, 101).....	4	4
Principles of Botany (Bot. 20, 21).....	3	3
General Forestry (For. 101, 102).....	3	3
Library Practice (Libr. 1).....	1	
Hygiene (Phys. Ed. 19)		1
	—	—
	21	21

SOPHOMORE YEAR

French, German (Mod. Lang. 101, 102, 201, 202) or Modern English Prose (English 81, 82).....	3	3
Engineering Physics (Physics 101, 102).....	5	5
Zoology (Zool. 101, 102).....	3	3
Forest Botany (Bot. 30, 31).....	3	3
Silviculture (For. 201, 202).....	2	3
Topographic Surveying (C. E. 205).....	5	
Engineering Geology (Min. 142).....		4
	—	—
	21	21

JUNIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)..	1	1
French, German (Mod. Lang. 103, 104, 203, 204) or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Introductory Entomology (Zool. 301).....	3	
Advanced Silviculture (For. 203, 204).....	2	2
Forest Surveying and Mapping (For. 303).....		3
Forest Entomology (Zool. 304).....		3
Mensuration (For. 301, 302).....	3	4
Forest Pathology (Bot. 106).....	4	
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	—	—
	17	17

SENIOR YEAR

Timber Testing (Exp. Eng. 127).....		1
Timber Technology (For. 502).....		2
Elements of Steam Engineering (M. E. 125).....	2	
Management (For. 401, 402).....	5	5
Utilization (For. 403).....	2	
Lumbering (For. 404).....		5
Dendrology (For. 501).....	5	
Wood Preservation (For. 503).....	2	
National Forest Administration (For. 405).....		3
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
	—	—
	17	17

LOGGING ENGINEERING

The great problem confronting the forest owners of this State now is the harvesting of the timber crop. As the woodman's axe and saw increase the distance between the standing timber and drivable streams, the difficulty of getting logs to the mill is more than correspondingly increased. In fact, with the employment of improved machinery and logging devices in a region of rugged topography, a distinct and peculiar engineering problem arises. So keenly have the lumbermen of the State felt the need of assistance in coping with this problem, that they have requested the creation of a course in logging engineering, the purpose of which would be to prepare young men to be of use to them in bringing to market this second greatest material resource of the State. To meet this need the College offers the following course in Logging Engineering.

FRESHMAN YEAR.

	<i>Semesters</i>	
	1st.	2d.
Rhetoric (English 31, 32)	3	3
Elements of Literature (English 41, 42).....	2	2
Trigonometry (Math. 12)	3	
Mechanical Drawing (M. E. 101)	2	
Plane Surveying (C. E. 201)		5
General Chemistry (Chem. 100, 101)	4	4
Woodwork (Shop 105)	3	
Woodwork (Shop 111)		3
General Forestry (For. 101, 102)	3	3
Library Practice (Libr. 1)	1	
Hygiene (Hyg. 19)		1
	21	21

SUMMER WORK.

Three Months in Logging Camps.

SOPHOMORE YEAR.

	Semester	
	1st.	2nd.
French or German (Mod. Lang. 101, 102, or 201, 202) or		
Modern Eng. Prose (Eng. 81, 82)	3	3
Engineering Physics (Physics 101, 102)	5	5
Principles of Economics (Com. 210)	3	
Labor Problems (Com. 213)		3
Blacksmithing (Shop 120)	3	
Machine Shop (Shop 200)		2
Tool Making and Tempering (Shop 121)		1
Denderology (For. 504)	2	
Forest Protection (For. 406)		2
Topographic Surveying (C. E. 204)	5	
Railroad Surveying (C. E. 211)		5
	—	—
	21	21

SUMMER WORK.

This work should be a practical application of both Topographic Surveying and Railroad Surveying, studied in College during the preceding year.

SUMMER WORK.

Three Months in Logging Camps.

JUNIOR YEAR.

Argumentative Themes, Presentation (Eng. 101, 102) ..	1	1
French, German (Mod. Lang. 103, 104, or 203, 204) or		
Constitutional Law and Politics (Pol. Sci. 320)	3	
State and Municipal Govt. (Pol. Sci. 322)		3
Forest Surveying and Mapping (For. 303)		3
Mensuration (For. 301, 302)	3	4
Hydraulics (For. 602)	2	
Theoretical Instruction (Mil. Sci. 1, 2)	1	1
Logging Railroads (For. 601)	3	
Logging Materials (Exp. Eng. 128)		3
Mechanism (M. E. 120)	4	
Elements of Steam Engineering (M. E. 300)		2
	—	—
	17	17

SUMMER WORK.

Three Months in Logging Camps.

The work of this vacation should be devoted to timber cruising under the supervision of an expert cruiser. Scientific methods should be employed. Reports should be worked up and the areas cruised carefully mapped.

SENIOR YEAR.

	Semester	
	1st.	2nd.
Bridge Construction (For. 603).....		3
Logging Engines (For. 604)	4	
Lumbering (For. 404)		5
Wood Preservation (For. 503)	2	
Business Management (For. 605)		3
Theoretical Instruction (Mil. Sci. 3, 4)	1	1
Electrical Machines (E. E. 402)	2	
Logging Devices and Equipment (For. 606, 607).....	5	5
Special Subjects (For. 608)	3	
	—	—
	17	17

COURSES IN DOMESTIC SCIENCE AND ART

The School of Domestic Science and Art offers two four-year courses; Domestic Science and Domestic Art, each of which leads to the degree of Bachelor of Science. In addition, there is the Secondary Course in Domestic Science and Art, which leads to freshman registration.

Professional, technical, and commercial training is everywhere offered to men. The tendency in all lines of education is so to prepare men that they may readily adjust themselves to their environment and thus become more efficient and more valuable in their world service.

Woman's relation to the economic world has undergone great changes in recent years but her education still follows the old lines. The school of Domestic Science and Art has been established that young women may be trained in their life work, Home Administration; that they may be so instructed that they can readily adjust themselves to the demands the world puts upon them; and that they may respect their own occupation and profession.

The demand for capable teachers of Domestic Science and Art is greater than the supply; and those who graduate from these courses are well prepared to teach.

Secondary Course in Domestic Science and Art

FIRST YEAR	<i>Semester</i>	
	1st.	2nd.
Advanced Grammar (English A, B).....	4	2
Elements of Literature (Eng. C, D).....	1	3
Algebra (Math. A, B).....	5	5
Ancient History (Hist. A).....	3	
Mediæval and Modern History (Hist. B).....		3
Food Preparation (Dom. Sci. A, B).....	3	3
Sewing (Dom. Art A, B).....	3	3
	<hr/>	<hr/>
	19	19

SECOND YEAR

	Semester	
	1st.	2nd.
Rhetoric and Composition (English E, F).....	3	3
Elements of Literature (English G, H).....	2	2
Algebra, Plane Geometry (Math. C, D, K).....	5	5
Drawing (Art D).....		2
Essentials of Botany (Bot. A).....	3	
Food Preparation (Dom. Sci. C, D).....	3	3
Sewing (Dom. Art C, D).....	3	3
Laundering (Dom. Sci. E).....		1
	19	19

Degree Course in Domestic Science and Art

FRESHMAN YEAR

Rhetoric (English 31, 32).....	3	3
*Elements of Literature (English 41).....	2	
*Public Speaking (Eng. 109).....		2
General Chemistry (Chem. 102, 103).....	4	4
Principles of Botany (Bot. 20, 21).....	3	3
English History (Hist. 10).....	3	
Drawing (Art 102).....	2	
Light and Shade (Art 103).....		2
***Laundering (Dom. Sci. 401).....		1
**Hand Sewing, Garment Making (Dom. Art 101, 102) ..	3	3
***Home Nursing (Dom. Sci. 511).....		2
Library Practice (Libr. 1).....	1	
Hygiene (Phys. Ed. 9).....		1
	21	21

*These courses alternate in such way that half of the students in the freshman class may take Public Speaking during the first semester and the Elements of Literature during the second semester.

**Students who present credit in Sewing from accredited high schools are not required to take Domestic Art courses 101 and 102 through both semesters. Such students take Sewing (Domestic Art 103), three credits, first semester, and may elect three credits for the second semester.

***These courses alternate in such a way that half of the students in the freshman class may take Home Nursing the first semester and half take Laundering.

SOPHOMORE YEAR	Semester	
	1st.	2nd.
The Essay (English 51).....	3	
The English Drama (English 52).....		3
French, German, Spanish (Mod. Lang. 101, 102, 201, 202, 301, 302).....	3	3
Household Physics (Phys. 131).....	3	
Household Bacteriology (Bact. 300).....		4
Organic Chemistry (Chem. 200).....	4	
Chemistry of Foods (Chem. 402).....		4
Zoology (Zool. 103).....	3	
Still Life in Color (Art 204).....		2
Home and Private Business Management (Com. 122).....		2
*Food Preparation (Dom. Sci. 101, 102).....	3	3
Commercial Geography (Com. 201).....	2	
	—	—
	21	21

JUNIOR YEAR

Beginning with the junior year students are given option of specializing in either Domestic Science or Domestic Art.

DOMESTIC SCIENCE

JUNIOR YEAR

English Literature (English 61, 62).....	3	3
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304).....	3	3
Physiology (Zool. 203).....	4	
Food Preparation (Dom. Sci. 104, 105).....	3	3
House Sanitation (Dom. Sci. 301).....		2
Electives	4	6
	—	—
	17	17

*Students who present credits in Domestic Science from accredited high schools are not required to take Food Preparation (Domestic Science 101, 102) through both semesters. Such Students will take Food Preparation (Domestic Science 103), three credits, first semester, and may elect three credits for the second semester.

	<i>Semester</i>	
	1st.	2nd.
<i>Electives—</i>		
Dressmaking (Dom. Art 201, 202).....	3	3
House Decoration and Furnishing (Dom. Art. 502).....		2
Landscape Gardening (Flor. 55).....		2
Practical Sociology (Com. 250).....		3
Evolution of the House (Dom. Sci. 530).....	2	
History of Education (Ind. Ped. 120).....		3
School Management (Ind. Ped. 130).....	3	
Advanced Physiology (Zool. 205).....		3

Electives may be chosen from any department upon approval of the Dean of the School of Domestic Science and Art.

SENIOR YEAR

Dietetics (Dom. Sci. 201, 202).....	5	5
General Psychology (Ind. Ped. 101).....	3	
Household Administration (Dom. Sci. 501).....		2
American Literature (English 71, 72).....	2	2
Electives	7	8
	—	—
	17	17

Electives—

Special Methods in Dom. Sci. (Ind. Ped. 160, 161).....	3	3
Special Methods in Dom. Art (Ind. Ped. 160, 162).....	3	3
Principles of Vegetable Gardening (Hort. 31).....		3
Tailoring, Advanced Dressmaking (Dom. Art. 203, 204).....	3	3
Basketry (Dom. Art 401, 402).....	2	2
Art Appreciation (Art. 408).....	2	
Costume Design (Dom. Art. 701).....		2
Rural Sociology (Com. 252).....		3
History of Oregon (Hist. 70).....		2

Electives may be chosen from any department upon approval of the Dean of the School of Domestic Science and Art.

Graduate Work

The following graduate courses will be conducted for those students only who are capable of carrying on investigations. They will deal with new and unsettled problems whose solution will help place the subject of Domestic Science on a more secure scientific basis. (See Courses 550, 551, 701, 702.)

DOMESTIC ART

	JUNIOR YEAR	
	1st.	2nd.
English Literature (English 61, 62).....	3	3
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304).....	3	3
Physiology (Zool. 203).....		4
Chemistry of Textiles (Chem. 202).....	3	
Dressmaking (Dom. Art 201, 202).....	3	3
House Sanitation (Dom. Sci. 301).....	2	
Electives	3	4
	—	—
	17	17

Electives—

Food Preparation (Dom. Sci. 104, 105).....	3	3
House Construction, Household Decoration (Dom. Art 501, 502).....	2	2
Design and Stencil (Art 5, 6).....	2	2
Practical Sociology (Com. 250).....		3
Basketry (Dom. Art. 401, 402).....	2	2
Landscape Gardening (Flor. 55).....		2
History of Oregon (Hist. 70).....		2
School Management (Ind. Ped. 130).....	3	
History of Education (Ind. Ped. 120).....		3

Electives may be chosen from any department upon approval of the Dean of the School of Domestic Science and Art.

SENIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
American Literature (English 71, 72).....	2	2
Tailoring and Advanced Dressmaking (Dom. Art 203, 204)	3	3
General Psychology (Ind. Ped. 101).....	3	
Household Administration (Dom. Sci. 501).....		2
Textiles (Dom. Art, 601).....		2
Electives	9	8
	—	—
	17	17

Electives—

Handwork and Weaving (Dom. Art. 404, 405).....	2	2
Millinery (Dom. Art 301).....		2
Special Method in Dom. Sci. (Ind. Ped. 160 161).....	3	2
Special Method in Dom. Art (Ind. Ped. 162, 163).....	3	2
Dietetics (Dom. Sci. 201, 202).....	5	5
Art Appreciation (Art 408).....	2	
Costume Design (Dom. Art 701).....	2	

Electives may be chosen from any department upon approval of the Dean of the School of Domestic Science and Art.

COURSES IN ENGINEERING

The school of Engineering offers four four-year courses: Civil Engineering, Electrical Engineering, Mechanical Engineering, and Mining Engineering, each of which leads to the degree of Bachelor of Science. It also offers a two-year course in Mechanic Arts which leads to freshman registration in any of the four-year courses mentioned above.

Secondary Course in Mechanic Arts

The Secondary Course in Mechanic Arts is designed to meet the needs of those students who desire industrial training. It is open to those who have completed the eighth grade State examinations, provided they do not come from places where local high schools are offering the same line of work. It is thought that this course will be helpful to those who desire to become workers in wood or metal; to those who wish to teach industrial work in the schools of the State, or elsewhere, as well as to those who intend to take one of the degree courses later. The scope of the work is necessarily more limited than in the degree courses, but special stress is laid upon the industrial features. The tendency of modern education is toward industrial training. Many believe that their training should begin in the common schools. If so, colleges and secondary schools must supply teachers who are proficient in this work.

In this course, one-third of the student's time must be given to the distinctively industrial work. Woodwork is required during the first year, but considerable latitude is allowed in the selection of the work of the second year.

The student is brought into actual contact with the work itself by being required to become proficient in the construction of useful articles of wood and metal. The purpose throughout is to combine the training of mind, hand, and eye in a manner that will enable the student to formulate plans rapidly and execute them skillfully.

Eighth grade graduates, coming from localities not offering in the high school the work outlined below, are eligible to register as freshmen in any of the Engineering courses, after having completed the following two years' work:

	FIRST YEAR		<i>Semester</i>	
			1st.	2nd.
Advanced Grammar (English A, B).....	4		4	2
Elements of Literature (English C, D).....	1		1	3
Algebra (Math. A, B).....	5		5	5
Ancient History (Hist. A).....	3		3	
Mediæval and Modern History (Hist. B).....				3
Drawing (Art A).....	3		3	
Machine Sketching (Art B).....				3
Woodwork (Shop A, B).....	5		5	5
	—		—	—
	21		21	21

SECOND YEAR				
Rhetoric and Composition (English E, F).....	3		3	3
Elements of Literature (English G, H).....	2		2	2
Algebra, Geometry, (Math. C, D, E).....	5		5	5
Elementary Physics (Physics A, B).....	4		4	4
Business Methods (Com. F).....				2
Commercial Law (Com. L).....	2		2	
Woodwork (Shop C, D), Patternmaking (Shop E, F) or Blacksmithing (Shop J, K).....	5		5	5
	—		—	—
	21		21	21

COURSE IN CIVIL ENGINEERING

The purpose of this course is to give the student thorough theoretical instruction, accompanied by as much laboratory and field practice as possible. The course includes such basic studies as English, Mathematics, Chemistry, Physics, Drawing, Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department. The student has the opportunity, during the senior year, to select his work, along lines that he is most interested in. Five options are offered, leading respectively to Hydraulics, Highways, Structural Engineering, Railroads and Irrigation.

Recognizing the value of drawing to the professional engineer, not only as a means of expressing his ideas and of carrying out his plans, but also as a means by which the young graduate may enter some of the most desirable positions, the department lays special emphasis upon this subject. Besides the general course in Mechanical Drawing, three additional more technical courses are required in the Civil Engineering course. One of these, a course in Lettering and Title Design, is given by the department of Art, the others by this department. Much additional drawing is required in connection with the preparation of plans and working drawings, as part of the office work of the higher technical courses.

The work in Surveying begins with the freshman year, and continues through the sophomore year, with from six to ten hours of field practice a week. The student serves in subordinate positions at first, and gradually advances as a knowledge of the instruments is acquired until he is placed in charge of field parties and is held responsible for the results accomplished. During the freshman year he is given practice in land surveying and leveling, and during the sophomore year in topographic and railroad surveying. At all times, conscientious attention to duty, accuracy, and speed will be demanded. Every student keeps full and accurate notes of all work done in the field. These, after being criticised, are transcribed and filed with the instructor.

In the study of Highways, special reference is made to the conditions and needs in Oregon. Due consideration is given to the drainage and maintenance of dirt and gravel roads. In consequence of the vast area of the State, this class of roads must, of necessity, constitute the greater part of its highways for many years. The courses in theoretical and applied hydraulics cover a period of one and a half years. The various irrigation projects of Oregon offer to our students and graduates excellent opportunities for study and work.

Degree Course in Civil Engineering

	FRESHMAN YEAR		<i>Semester</i>	
	1st.	2nd.		
Rhetoric (English 31, 32).....	3	3		
Elements of Literature (English 41).....	2			
Trigonometry, College Algebra (Math. 11, 21).....	5			
Elementary Analysis (Math. 31).....		5		
Spherical Trigonometry (Math. 15).....	1			
General Chemistry (Chem. 100, 101).....	4	4		
Mechanical Drawing (C. E. 101).....	3			
Descriptive Geometry (M. E. 102).....		3		
Plane Surveying (C. E. 201).....		5		
Freehand Lettering and Title Design (Art 101).....	2			
Library Practice (Libr. 1).....	1			
Hygiene (Phys. Ed. 19).....		1		
	—	—		
	21	21		

SOPHOMORE YEAR			
Differential and Integral Calculus (Math. 51, 52).....	5	5	
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1	
Engineering Physics (Phys. 101, 102).....	5	5	
French, German, Spanish (Mod. Lang. 101, 102, 201, 202, 301, 302), or			
Modern English Prose (English 81, 82).....	3	3	
Topographic Surveying (C. E. 204).....	5		
Railroad Surveying (C. E. 211).....		5	
Engineering Drawing (C. E. 103, 104).....	2	2	
	—	—	
	21	21	

JUNIOR YEAR

	Semester	
	1st.	2nd.
Statics and Dynamics (M. E. 200).....	4	
Strength of Materials (M. E. 201).....		2
Hydraulics (M. E. 202).....		2
Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304), or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Materials of Engineering (M. E. 124).....	2	
Roads and Pavements (C. E. 401).....	3	
Road and Paving Materials (Exp. Eng. 131).....	1	
Cement Laboratory (Exp. Eng. 126).....	1	
Masonry and Foundations (C. E. 501).....		4
Structural Materials Laboratory (Exp. Eng. 123).....		2
Hydraulics Laboratory (Exp. Eng. 141).....		1
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	—	—
	17	17

SENIOR YEAR

Roofs and Bridges (C. E. 503, 504).....	4	3
Engineering Seminar (C. E. 601, 602).....	1	1
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
Contracts and Specifications (C. E. 603).....		2
Electives (Either Group 1, 2, 3, 4 or 5).....	11	10
	—	—
	17	17

During the senior year students may choose any one of the following option groups. Groups will be given only when the number of students applying for them is large enough to justify forming the section.

GROUP 1

	<i>Semester</i>	
	1st.	2nd.
Sanitary Engineering (C. E. 301)	3	
Bacteriology (Bact. 600)	2	
City Engineering (C. E. 206)	4	
Chemistry of Water (Chem. 403)		2
Hydraulic Motors (M. E. 204)	2	
Study of Electrical Machinery (E. E. 402)		4
Water Supply Engineering (C. E. 302)		4
	—	—
	11	10

GROUP 2

Highway Engineering (C. E. 402)	3	
Economics of Highway Construction (C. E. 404)		3
Engineering Geology (Min. Eng. 142)	4	
Chemistry of Highway Materials (Chem. 405)		3
Road Machinery (M. E. 302)	2	
Road and Paving Materials (Exp. Eng. 131)	2	
Electives (Restricted)		4
	—	—
	11	10

GROUP 3

Reinforced Concrete (C. E. 509)	3	
Advanced Structural Laboratory (Exp. Eng. 124)	1	
Study of Electrical Machinery (E. E. 402)		4
Structural Engineering (C. E. 505, 506)	2	3
Electives (Restricted)	5	3
	—	—
	11	10

GROUP 4

	Semester	
	1st.	2nd.
Railway Engineering (C. E. 212, 213).....	3	3
Study of Electrical Machinery (E. E. 402).....		4
Reinforced Concrete (C. E. 509).....	3	
Advanced Structural Laboratory (Exp. Eng. 124).....	1	
City Engineering (C. E. 206)	4	
Precise Surveying and Geodesy (C. E. 207).....		3

GROUP 5

	Semester	
	1st.	2nd.
Soil Physics (Agron. 102)		5
Irrigation Farming (Agron. 301).....	3	
Irrigation Engineering (C. E. 303).....	4	
Design of Irrigation Structures (C. E. 508).....		5
Reinforced Concrete (C. E. 509).....	3	
Advanced Structural Laboratory (Exp. Eng. 124).....	1	
	11	10

COURSE IN ELECTRICAL ENGINEERING

COURSES. Since the advent of steam as a motive power, it is probable that no agency has so deeply affected the course of history and the intimate life of a large portion of the human race as has the electric current, whether used in the transmission of intelligence, to furnish light, or to provide power for transportation and the industries.

Already the electrical industries are counted among the greatest in the world; their employees number more than a hundred thousand in the United States alone; their business in this country doubles every five years and their field is ever expanding.

Notwithstanding this fact, most of the business is controlled by comparatively few corporations; hence the competition for desirable positions is keen; and since the field in Electrical Engineering for the independent engineer is limited, only men of exceptional ability, energy, and character become more than salaried employees, who work very hard for comparatively small compensation.

Accordingly, no man is advised to take Electrical Engineering who does not consider himself, by taste and ability, exceptionally fitted therefor.

For men interested chiefly in the commercial, or business side of the profession, it is believed that the electrical supply and contracting business offers opportunities that are unusual; but which, nevertheless, have been practically overlooked by college graduates. Accordingly, special work in accounting, commercial law, the study of electrical appliances and the principles of the contracting business are offered for those who would care to enter this field.

The college course is designed especially to train the young engineer in the theory of his profession, such practical work as is given in shop and laboratory being subordinated to this end. Practical acquaintance with actual conditions can be acquired only in the field, during vacation and after graduation. For this reason and in order to supplement his college education, the student is urged to spend at least a part of his vacation in some line of electrical industry.

Starting with the foundation subjects of mathematics, science, drawing, and shopwork, the student proceeds through the study of form expression in Descriptive Geometry, Mechanism, the laws of Mechanics, Strength of Materials, stress in structures and machinery; through the study of electricity and its application to machinery, the characteristic performance of electrical apparatus, its design and operation; through the study of thermodynamics as applied to various types of heat engines, and finally to the composite power system involving the steam or hydroelectric power plant and the system for transmitting and distributing electrical energy.

ELECTIVES. The course in Electrical Engineering is designed to meet the needs of two classes of students, those who expect to become corporation employees and those who desire to engage in the supply and contracting business on their own account. In the sophomore year one of three elective subjects must be chosen, English, Modern Language, or Accounting. It is expected that the latter course will be elected by students who intend to prepare for the supply and contracting business.

Degree Course in Electrical Engineering

FRESHMAN YEAR	Semester	
	1st.	2nd.
Rhetoric (English 31, 32)	3	3
Elements of Literature (English 41, 42)	2	2
Trigonometry, College Algebra (Math. 11, 21)	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem. 100, 101)	4	4
Mechanical Drawing (M. E. 100)	3	
Descriptive Geometry (M. E. 102)		3
Woodwork (Shop 101)	3	
Patternmaking (Shop 102)		3
Library Practice (Libr. 1)	1	
Hygiene (Phys. Ed. 19)		1
	—	—
	21	21

Freshmen entering with advanced credit will, in general, be required to register for E. E. 121-122—Survey of Electrical Industries.

SOPHOMORE YEAR

Differential and Integral Calculus (Math. 51, 52)	5	5
Engineering Physics (Physics 101, 102)	5	5
Argumentative Themes, Presentation (Eng. 101, 102)	1	1
French, German, Spanish (Mod. Lang. 101, 102, 201, 202, 301, 302), or		
Modern English Prose (English 81, 82) or		
Accounting (Commerce 107, 108)	3	3
Mechanical Drawing (M. E. 103)	4	
Mechanism (M. E. 120)		4
Blacksmithing (Shop 120)	3	
Foundry (Shop 131)		3
	—	—
	21	21

JUNIOR YEAR

	Semester	
	1st.	2nd.
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or		
Constitutional Law and Politics (Com. 320),		
State and Municipal Government (Com. 322), or		
Commercial Law (Commerce 300-301)	3	3
Statics and Dynamics (M. E. 200)	4	
Strength of Materials (M. E. 201)		2
Hydraulics (M. E. 202)		2
Electrical and Magnetic Measurements (Physics 201)....	2	
Theory and Practice of Steam Engineering (M. E. 305)		3
Electrical Engineering Laboratory (E. E. 201, 202).....	3	3
Principles of Applied Electricity (E. E. 101, 102).....	4	3
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	—	—
	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Alternating Current Machinery (E. E. 103).....	3	
Power Plants, Transmission and Distributing Systems (E. E. 108)		3
Electrical Design (E. E. 105, 106)	2	2
Electrical Engineering Laboratory (E. E. 204)	4	
Advanced Steam Engineering (M. E. 306).....	3	
Elementary Mech. Laboratory (Exp. Eng. 105, 106).....	2	2
Machine Shop (Shop 201)		3
Electives		4
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
	—	—
	17	17

COURSE IN MECHANICAL ENGINEERING

The course in Mechanical Engineering has for its purpose the preparation of young men for positions of usefulness and responsibility in the industrial life of the country.

The Pacific Northwest is just now entering upon a period of rapid progress in the building of railroads, the development of water power, the marketing of forest products, and the upbuilding of manufactories, all of which require men conversant with the general principles of engineering. It is the purpose of all engineering courses to contribute to this general advancement, by turning out graduates equipped with the necessary knowledge and skill to make them active factors in this great work.

It is the general plan of the course in Mechanical Engineering to lay a broad foundation in English, Mathematics, Chemistry, and Physics, accompanied by Drawing and Shopwork, during the first two years of the course. The work of the last two years is more technical and professional in its nature, consisting in a study of the principles involved in the development of power by steam engines, water wheels, gas and gasoline engines, and steam turbines. It also involves a critical study of the design of machines and materials entering into their construction, as well as tests to determine their efficiency.

Instruction is given by means of lectures, recitations, and laboratory exercises. The scientific principles involved in machines and mechanical movements are taught in the class room as well as the application of mathematics to the solution of problems in mechanical engineering. In the shops, the student learns the use of tools and the value of different methods of doing work from the standpoint of economical construction. In the drafting room, he learns to make working drawings and blue-prints of machines, and to formulate designs of his own.

With these advantages to aid him, the ambitious student should be able to take and maintain a position in the general industrial and engineering development which is the leading and characteristic feature of the age in which we live.

Degree Course in Mechanical Engineering

	FRESHMAN YEAR	
	Semester	
	1st.	2nd.
Rhetoric (English 31, 32)	3	3
Elements of Literature (English 41, 42)	2	2
Trigonometry, College Algebra (Math. 11, 21)	5	
Elementary Analysis (Math. 31)		5
*General Chemistry (Chem. 100, 101)	4	4
*Mechanical Drawing (M. E. 100)	3	
Descriptive Geometry (M. E. 102)		3
Woodwork (Shop 101)	3	
Pattern Making (Shop 102)		3
Library Practice (Libr. 1)	1	
Hygiene (Phys. Ed. 19)		1
	21	21
SOPHOMORE YEAR		
Argumentative Themes, Presentation (Eng. 101, 102)	1	1
French, German, Spanish (Mod. Lang. 101, 102, 201, 202, 301, 302), or		
Modern English Prose (English 81, 82)	3	3
Differential Integral Calculus (Math. 51, 52)	5	5
*Engineering Physics (Physics 101, 102)	5	5
*Mechanical Drawing (M. E. 103)	4	
*Mechanism (M. E. 120)		4
*Foundry Practice (Shop 130)	3	
*Blacksmithing (Shop 120)		3
	21	21

Students desiring to do so, may omit the subjects marked () and take the following: *Freshman Year*—Architectural Drawing (Arch. 501), Orders (Arch. 502), Pen and Pencil Rendering (Arch. 503, 504), Water Color Rendering (Arch. 505, 506). *Sophomore Year*—Wood Construction (Arch. 507), Metal and Masonry (Arch. 508), Elements of Design (Arch. 510, 511), Shades and Shadows (Arch. 509), Physics (Physics 5, 6). It is understood, however, that the work so elected does not count towards a degree in Mechanical Engineering.

JUNIOR YEAR	Semester	
	1st.	2nd.
Composition of Addresses, Extempore Speaking (Eng. 103, 104).....	2	2
French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304), or		
Constitutional Law and Politics (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Statics and Dynamics (M. E. 200)	4	
Strength of Materials (M. E. 201).....		2
Hydraulics (M. E. 202).....		2
Materials of Engineering (M. E. 124).....	2	
Theory and Practice of Steam Engineering (M. E. 305).....		3
Elementary Mechanical Laboratory, Elementary Power Laboratory (Exp. Eng. 105, 106).....	2	2
Machine Shop (Shop 200, 202).....	2	2
Tool Making and Tempering (Shop. 121).....	1	
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
	—	—
	17	17

SENIOR YEAR

Machine Design (M. E. 125, 126).....	4	4
Advanced Steam Engineering (M. E. 306).....	3	
Steam Power Plant Design (M. E. 127).....		2
Internal Combustion Motors (M. E. 315).....		2
Steam Turbines (M. E. 312).....		2
Study of Electrical Machinery (E. E. 402).....		4
Advanced Mechanical Laboratory, Advanced Power Laboratory (Exp. Eng. 107, 108).....	2	2
Hydraulic Motors (M. E. 204).....	2	
Compressed Air and Refrigeration (M. E. 308) or Heating and Ventilating (M. E. 320).....	2	
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
Electives	3	
	—	—
	17	17

COURSE IN MINING ENGINEERING

The course in Mining Engineering is planned to give the student a thorough knowledge of the principles which form the groundwork of the sciences of Mining and Metallurgy.

It is the aim of the Mining Engineering department in arranging the courses to give the student a drill in the fundamental studies common to all engineering courses, such as Mathematics, Chemistry, English, Physics, Drawing, Mechanics, etc. In the latter part of his course the student applies the principles of these fundamental studies to the more distinctive technical subjects, such as Mineralogy, Geology, Mining, Mine Surveying, Metallurgy, and Ore Dressing.

The methods of instruction include the ordinary lecture, textbook, and recitation work, supplemented, so far as possible, by problems and illustrations drawn from actual mining and metallurgical practice. The successful mining engineer deals largely with concrete problems, hence the laboratory method of instruction is given a very important place in the training of the student. A portion of the last two summers is devoted to summer school work in Mine Surveying, and Mining and Metallurgical inspection. The students are required to keep systematic notes on the summer work, and to turn in to the professor in charge a complete report. On these trips of inspection, visits are made to plants which exemplify, often on a large scale, the application of principles taught in the class room to problems of commercial operation.

The technical training for the mining engineer is broad rather than highly specialized. Aside from the basic subjects common to all engineering courses, he must be well grounded in the principles of Chemistry, Metallurgy, and Geology. A student who pursues the Mining Engineering course to completion is able to choose his life work from among a number of distinct industrial lines; for example, he may choose his work in the management, investigation and exploitation of mines; he may choose his work in Ore Dressing, which covers the separation of the valuable minerals from the waste; he may go into metallurgical lines, where he extracts the metal from its ores and puts it in shape for the market; or he may choose his work along geological lines and work either for the National Government or for private corporations.

Degree Course in Mining Engineering

FRESHMAN YEAR

	<i>Semester</i>	
	1st.	2nd.
Rhetoric (English 31, 32).....	3	3
Blacksmithing (Shop 123)	2	
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100, 101).....	4	4
Mechanical Drawing (M. E. 100).....	3	
Descriptive Geometry (M. E. 102).....		3
Plane Surveying (C. E. 201).....		5
Woodwork (Shop 105).....	3	
Library Practice (Libr. 1).....	1	
Hygiene (Phys. Ed. 19).....		1
	—	—
	21	21

SOPHOMORE YEAR

Differential and Integral Calculus (Math. 51, 52).....	5	5
Engineering Physics (Physics 101, 102).....	5	5
Argumentative Themes (Eng. 101).....	1	
Qualitative Analysis (Chem. 301).....	5	
Quantitative Analysis (Chem. 401).....		5
Crystallography and Blowpipe Analysis (Min. 101).....	5	
Determinative Mineralogy (Min. 102).....		3
General Geology (Min. 140).....		3
	—	—
	21	21
Practical Mining Work	10	

NOTE—*Practical Mining Work*. All students in Mining will be required to do not less than *two months'* work in mines, mills, or other industrial plants allied to mining work, before entering upon the senior year.

GROUP 1—MINING

JUNIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Composition of Addresses, Extempore Speaking (Eng. 103, 104)	2	2
Presentation (Eng. 102)		1
Statics and Dynamics (M. E. 200)	4	
Strength of Materials (M. E. 201)		2
Hydraulics (M. E. 202)		2
Fire Assaying (Min. 301)	4	
Ore Dressing (Min. 260)		4
Mine Surveying and Mining Law (Min. 220)		3
Rock and Earth Excavation (Min. 201, 202)	2	2
Industrial Calculations (Min. 321)	4	
Theoretical Instruction (Mil. Sci. 1, 2)	1	1
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	17	17

SENIOR YEAR

Petrology (Min. 121)	3	
Economic Geology (Min. 160)		3
Mining Methods, Mine Economics (Min. 205, 206)	3	4
Cyanidation of Ores (Min. 341)	3	
Metallurgy Laboratory (Min. 342)		3
Metallurgy of Lead and Copper (Min. 325)	4	
Power Equipment (Min. 249)	3	
Structural Materials Laboratory (Exp. Eng. 123)		2
Study of Electrical Machinery (E. E. 402)		4
Theoretical Instruction (Mil. Sci. 3, 4)	1	1
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	17	17

GROUP 2—GEOLOGY

JUNIOR YEAR

	Semester	
	1st.	2nd.
Composition of Addresses, Extempore Speaking (Eng. 103, 104).....	2	2
Statics and Dynamics (M. E. 200).....	4	
Strength of Materials (M. E. 201).....		2
Hydraulics (M. E. 202).....		2
Geochemistry (Min. 181, 182).....	4	4
Principles of Botany (Bot. 20, 21).....	3	3
Zoology (Zool. 101, 102).....	2	3
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
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	17	17

SENIOR YEAR

Petrology (Min. 121).....	3	
Economic Geology (Min. 160).....		3
Ore Deposits (Min. 185).....	5	
Field Geology (Min. 186).....		5
Petrography (Min. 131).....	4	
Geology of Oregon (Min. 190).....		3
Historical Geology (Min. 192).....		2
Industrial Calculations (Min. 321).....	4	
Mine Surveying and Mining Law (Min. 220).....		3
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
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	17	17

GROUP 3—CERAMICS

JUNIOR YEAR

	<i>Semester</i>	
	1st.	2nd.
Composition of Addresses Extempore Speaking (Eng. 103, 104).....	2	2
Statics and Dynamics (M. E. 200).....	4	
Strength of Materials (M. E. 201).....		2
Hydraulics (M. E. 202).....		2
Classification and Physical Testing of Clays (Min. 402) ..		5
Industrial Calculations (Min. 321).....	4	
Geochemistry (Min. 181).....	4	
Mining and Preparation of Clays (Min. 404).....		3
Elementary Mechanical Laboratory, Elementary Power Laboratory (Exp. Eng. 105, 106).....	2	2
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
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	17	17

SENIOR YEAR

Petrology (Min. 121).....	3	
Economic Geology (Min. 160).....		3
Drying and Burning (Min. 442).....	5	
Body Making, Designing and Shaping (Min. 421).....	5	
Glazing (Min. 450).....		3
Power Equipment (Min. 249).....	3	
Structural Materials Laboratory (Exp. Eng. 123).....		2
Study of Electrical Machinery (E. E. 402).....		4
Cement; Materials and Manufacture (Min. 461).....		4
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
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	17	17

GROUP 4—INDUSTRIAL CHEMISTRY

JUNIOR YEAR

	Semester	
	1st.	2nd.
Composition of Addresses, Extempore Speaking (Eng. 103, 104).....	2	2
Statics and Dynamics (M. E. 200).....	4	
Strength of Materials (M. E. 201).....		2
Hydraulics (M. E. 202).....		2
Fire Assaying (Min. 301).....	4	
Industrial Calculations (Min. 321).....	4	
Elementary Mechanical Laboratory, Elementary Power Laboratory (Exp. Eng. 105, 106).....	2	2
Organic Chemistry (Chem. 201).....		4
Chemistry for Engineers (Chem. 407).....		2
Electro-Chemistry (Chem. 406).....		2
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
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	17	17

SENIOR YEAR

Petrology (Min. 121).....	3	
Economic Geology (Min. 160).....		3
Cyanidation of Ores (Min. 341).....	3	
Metallurgy Laboratory (Min. 342).....		3
Metallurgy of Lead and Copper (Min. 326).....	4	
Study of Electrical Machinery (E. E. 402).....		4
Power Equipment (Min. 249).....	3	
Structural Materials Laboratory (Exp. Eng. 123).....		2
Industrial Chemistry (Chem. 600).....	3	
Geochemistry (Min. 182).....		4
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
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	17	17

COURSES IN COMMERCE

The most progressive colleges and universities are now offering courses in commerce and finance. These courses have rapidly gained favor in response to an almost universal demand for thoroughly trained men to assume leadership in the commerce of the world.

The School of Commerce has been established in harmony with this modern tendency in education. Its aim is to do for the business man what the trade school does for the mechanic, what the school of engineering does for the engineer, or what the school of law does for the lawyer. It does not claim to turn out experienced business men or "captains of industry," but men who shall seek, and be prepared to assume, the responsibilities of commercial and financial leadership after a comparatively short apprenticeship and practical experience.

A thorough business course, therefore, covers more than a study of bookkeeping, commercial law, and penmanship, though all are subjects of greatest importance. Thorough courses in English, economics, political science, modern languages, mathematics, natural sciences, etc., are equally important. In fact, all are in a sense only a means to one end: to facilitate the profitable exchange of commodities in the form of property or service. Hence the advantage of incorporating business courses into the curricula of the higher institutions of learning where courses in the basic subjects are already given.

The professional courses offered by the School of Commerce have been arranged and selected with special reference to two classes of students: the prospective business manager, and the office employee. The latter studies chiefly the methods and technique of commerce, while the former lays special stress on the principles of economics and commerce. Two courses are offered: A two-year, or secondary, course and a four-year course leading to the degree of Bachelor of Science. The Theory and Practice of Accounts, Stenography, and Commercial Law are the principal

technical subjects in the two-year course; while Economics, Trade and Transportation, Banking and Finance, Political Science, International Relations, and Public Accounting and Administration, are the professional subjects in the degree course. Special stress is laid on English in both courses, and the cultural development of the student is duly emphasized.

But while the School of Commerce emphasizes work preparatory to commercial pursuits, the fact that there is a business side to every vocation has been recognized by providing, in the second year of the Secondary courses, a two-hour course in Business Methods, especially adapted for the farmer, mechanic, housekeeper, professional man, etc. The laboratory and library facilities of the department are enjoyed by all students alike.

The Commercial course is especially attractive as a preparation for law; for teachers of commercial subjects; for public accountants; for administrative secretaries; and as a preparation for the Civil Service.

Secondary Course in Commerce

FIRST YEAR

	<i>Semester</i>	
	1st.	2nd.
Advanced Grammar and Composition (Eng. A, B).....	4	2
Elements of Literature (Eng. C, D).....	1	3
Algebra (Math. A, B).....	5	5
Ancient History (Hist. A).....	3	
Mediaeval and Modern History (Hist. B).....		3
Commercial Arithmetic (Com. A).....	5	
Bookkeeping (Com. B).....		5
Penmanship (Com. U, V).....	1	1
Drawing (Art A, C) or Typewriting (Sten. R, S).....	2	2
	<hr/> 21	<hr/> 21

SECOND YEAR

	<i>Semester</i>	
	1st.	2nd.
Rhetoric and Composition (English E, F).....	3	3
Elements of Literature (English G, H).....	2	2
Algebra, Plane Geometry (Math C, D, K).....	5	5
Business English (English 21).....		3
Elementary Commercial Law (Com. L, M).....	2	2
*Accounting (Com. 100, 101)	5	5
Civil Government and Administration (Com. K).....	3	
Advanced Penmanship (Com. W, X).....	1	1
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	21	21

Degree Course in Commerce

FRESHMAN YEAR

Rhetoric (English 31, 32).....	3	3
Elements of Literature (English 41, 42).....	2	2
Advanced Arithmetic (Com. 126).....	3	
Trigonometry (Math. 12).....		3
General Chemistry (Chem. 100, 101).....	4	4
Commercial Geography (Com. 200).....	3	
History of Commerce (Com. 205).....		3
Hygiene (Phys. Ed. 9 or 19)		1
*Accounting (Com. 100, 101).....	5	5
Library Practice (Libr. 1).....	1	
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	21	21

*Or Stenography and Typewriting (Com. 400, 401).

Students who have completed these courses in the Second year may take Commerce 400, 401, or Commerce 100, 101, or other electives of equivalent credits.

ANNUAL CATALOGUE

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SOPHOMORE YEAR

Semester

1st. 2nd.

General Physics (Physics 111, 112).....	3	3
French, German Spanish (Mod. Lang. 101, 102, 201, 202, 301, 302) or		
Modern English Prose (English 81, 82).....	3	3
Economic History of United States (Com. 206).....		4
Principles of Economics (Com. 210).....	4	
Stenography and Typewriting (Com. 402, 403) or		
Advanced Accounting (Com. 102, 103).....	5	5
Commercial Botany (Bot. 60).....	3	
Physiology and Hygiene (Zool. 204).....		3
**Business English (English 21).....	3	
European History (Hist. 30).....		3

JUNIOR YEAR

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French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304) or Electives	3	3
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
Money and Banking (Com. 230).....	3	
Corporation and Public Finance (Com. 233).....		3
Advanced Commercial Law (Com. 300, 301).....	3	3
Business Management (Com. 110).....	3	
Advertising (Com. 112).....		3
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
*Electives	3	3

Suggested Electives—

17 17

Transportation (Com. 240).
 Rural Economics (Com. 219).
 English 81, 82.
 Public Speaking 105, 106, 107, 108.
 Psychology, History, Science.
 Co-operation (Com. 260).
 Economic Organization (Com. 264).
 Rural Finance (Com. 265).

*Since women are exempt from Military Science, they are required to take four electives instead of three.

**Students who have completed this course in the second year take History 70.

SENIOR YEAR

	Semester	
	1st.	2nd.
Advanced Economics (Com. 214, 215)	3	3
Constitutional Law and Politics (Com. 320)	3	
State and Municipal Government (Com. 322).....		3
Composition of Addresses Extempore Speaking (Eng. 103, 104)	2	2
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
*Electives	3	3
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	17	17

Suggested Electives—

Labor Problems (Com. 213).

Practical Sociology (Com. 250).

Rural Sociology (Com. 252).

Cost Accounting (Com. 104).

Public Accounting and Auditing (Com. 106).

Commercial Pharmacy (Phr. 160, 161).

Pedagogy, Science, History.

American Literature, English Literature.

French, German, or Spanish (Mod. Lang. 105, 106, 205, 206, 305,
306).

*See note, Junior year.

COURSE IN PHARMACY

It is now so generally recognized and so universally admitted as to need but passing comment, that in order to attain to any degree of success in a scientific profession, it is necessary to be thoroughly trained in the science upon which the profession is based.

With reference to the profession of pharmacy, it may truly be said that it is one of applied sciences; since the pharmacist has constant use for a knowledge of the sciences of chemistry, of physics, of bacteriology, and of botany. It is, therefore, of utmost importance to the individual who has decided to enter upon a pharmaceutical career, that he begin properly in the matter of an education. The institution in which the study of the natural sciences is prominently featured, is without doubt the one best qualified to afford him the training suited to his particular needs. In this connection, attention is directed to colleges of the land grant or agricultural type. Financed by State and Federal Government, the material welfare of the institutions of this class is assured. With unusual facilities in the way of laboratories and equipment, and with an instructional force selected especially for the purpose, they are prepared to offer exceptional advantages for mental and manual training in those professions having for their foundation a knowledge of the sciences.

In recognition of the fitness of conditions and of an apparent need for such instruction, the Oregon Agricultural College, in 1898, added to its curricula a course in Pharmacy, the purpose of which is to afford the young men and women of the State an opportunity of obtaining a thorough training in the theoretical and practical features of this profession.

The course comprehends instruction in class and lecture room, extensive practice in the laboratory, and excursions afield in botany. The value of laboratory practice is fully appreciated; it is in this connection that facts mentioned in text-book and lecture are brought to the student's notice in a way that the importance is emphasized, the significance demonstrated, and the fact itself fixed in the mind. In the pharmaceutical laboratories, the student

becomes experienced in the manufacture of medicinal preparations and in filling prescriptions. In the laboratories of chemistry, of botany, of bacteriology, of physics, and of biology, he gains valuable experience in connection with each of these related sciences. It is expected that owing to the nature and extent of the instruction given, graduates of this course will be qualified to assume positions of trust and responsibility in the professional world. Not only is this training of benefit to the pharmacist; but it forms an ideal pre-medical course.

The enactment of the Pure Food and Durg Law of 1906 has opened a new and attractive field for those who are proficient in chemical and pharmaceutical knowledge. Laboratories for the examination of food and drug samples are being established in the various large cities of the country by the Federal Government. Positions in these laboratories are, in many instances, held by graduates of pharmacy.

Two courses are offered: One of four years, leading to the degree of Bachelor of Science in Pharmacy; the other a short course of two years, for the completion of which a certificate is given.

Degree Course in Pharmacy

FRESHMAN YEAR	<i>Semester</i>	
	1st.	2nd.
Rhetoric (English 31, 32).....	3	3
Elements of Literature (English 41, 42).....	2	2
Principles of Botany (Bot. 20, 21).....	3	3
Zoology (Zool. 101, 102)	3	3
General Chemistry (Chem. 100, 101).....	4	4
Pharmacy Physics (Physics 121, 122).....	3	3
Elementary Drawing (Art 109, 110).....	2	2
Library Practice (Libr. 1).....	1	
Hygiene (Phys. Ed, 19).....		1
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SOPHOMORE YEAR

	Semester	
	1st.	2nd.
American Literature (English 71, 72).....	2	2
Argumentative Themes, Presentation (Eng. 101, 102)...	1	1
French, German, Spanish (Mod. Lang. 101, 102, 201, 202, 301, 302).....	3	3
Qualitative Analysis (Chem. 300).....	4	
Organic Chemistry (Chem. 201).....		4
*Pharmaceutical Botany (Bot. 70, 71).....	3	3
Commercial Law (Com. 306)	2	
Pharmacy Accounting (Com. 124).....		2
Nomenclature (Phar. 100, 101).....	3	3
*Physiology, Anatomy (Zool. 201, 202).....	3	3
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	21	21

JUNIOR YEAR

French, German, Spanish (Mod. Lang. 103, 104, 203, 204, 303, 304).....	3	3
Quantitative Analysis (Chem. 400).....	4	
Physiological Chemistry (Chem. 409).....		4
General Pharmacy (Phar. 110, 111).....	3	6
Therapeutics and Doses (Phar. 120).....	3	
Pharmacognosy (Phar. 130, 131).....	3	3
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
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*Bot. 70, 71 and Zool. 201, 202 are elective courses. In case other courses are substituted for them it is suggested that the student elect Commerce 107, 108 and Chemistry 409, 413.

	SENIOR YEAR		<i>Semester</i>	
			1st.	2nd.
Composition of Addresses Extempore Speaking (Eng. 103, 104).....	2		2	2
Pharmacy Bacteriology (Bact. 201, 203).....	4		3	
General Pharmacy (Phar. 112).....	2			
Materia Medica, Toxicology (Phar. 140, 141).....	3		3	
Prescription Practice (Phar. 150, 151).....	3		6	
Theoretical Instruction (Mil. Sci. 3, 4).....	1		1	
Electives	2		2	
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			17	17

Two-Year Course in Pharmacy

(Requirements for entrance to this course are identical with those for entrance to any of the degree courses.)

FIRST YEAR				
General Chemistry (Chem. 100, 101).....	4		4	
General Pharmacy (Phar. 110, 111).....	3		6	
Nomenclature (Phar. 100, 101).....	3		3	
Therapeutics and Doses (Phar. 120).....	3			
Pharmacognosy (Phar. 130, 131).....	3		3	
Elective	1		1	
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			17	17

SECOND YEAR				
Qualitative Analysis (Chem. 300).....	4			
Organic Chemistry (Chem. 201).....			4	
General Pharmacy (Phar. 112).....	2			
Materia Medica, Toxicology (Phar. 140, 141).....	3		3	
Prescription Practice (Phar. 150, 151).....	3		6	
Electives	5		4	
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			17	17

INDUSTRIAL ARTS

Degree Course in Industrial Arts

FRESHMAN YEAR

	<i>Semester</i>	
	1st.	2nd.
Rhetoric (English 31, 32).....	3	3
Elements of Literature (English 41, 42).....	2	2
Trigonometry, College Algebra, (Math. 11, 21).....	5	
Plane Surveying (C. E. 203).....		3
General Chemistry (Chem. 100, 101).....	4	4
Mechanical Drawing (M. E. 100).....	3	
Descriptive Geometry (M. E. 102).....		3
Man. Train. for Elem. Grades (Ind. Arts 101, 102).....	3	3
Elementary Drawing (Art.).....		2
Library Practice (Libr. 1).....	1	
Hygiene (Phys. Ed. 19).....		1
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	21	21

SOPHOMORE YEAR

The Essay, The Eng. Drama (English 51, 52) or French, German, Spanish (Mod. Lang. 101, 102, 201, 202, 301, 302).....	3	3
Engineering Physics (Physics 101, 102).....	5	5
Commercial Geography (Com. 200).....	3	
Economic History of the U. S. (Com. 206).....		3
School Management (Ind. Ped. 130).....	3	
History of Education (Ind. Ped. 120).....		3
Advanced Manual Training (Ind. Arts 103).....	3	
Art Metal Work (Ind. Arts 104).....		3
Freehand Drawing (Art)	2	2
Electives	2	2
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	21	21

JUNIOR YEAR

	Semester	
	1st.	2nd.
Argumentative Themes, Presentation (Eng. 101, 102)....	1	1
Constitutional Law and Pol., State and Municipal Government (Com. 220, 322) or French, German, Spanish (Mod. Lang. 103, 104, 202, 204, 303, 304).....	3	3
General Psychology (Ind. Ped. 101).....	3	
General Method (Ind. Ped. 140).....		3
Wood Turning, Pattern Making (Ind. Arts 105).....	3	
Forging (Ind. Arts 120).....		3
Dendrology, Wood Technology (Forestry 504, 502).....	2	2
Theoretical Instruction (Mil. Sci. 1, 2).....	1	1
Electives	4	4
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	17	17

SENIOR YEAR

Composition of Addresses, Extempore Speaking (Eng. 103, 104).....	2	2
Special Meth. in Industrial Arts (Ind. Ped. 170, 171).....	3	3
Machine Shop (Ind. Arts 130, 131)	3	3
Theoretical Instruction (Mil. Sci. 3, 4).....	1	1
Electives	8	8
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	17	17

DEPARTMENTS OF INSTRUCTION

SCHOOL OF AGRICULTURE

AGRONOMY

Professor Scudder
Assistant Professor Hyslop
Assistant Professor Powers
Assistant Professor McCool
Mr. Bracker
Mr. _____

Agronomy is the science of the fields and the crops of the fields. Instruction in this science is offered by the department of Agronomy in the following subjects:

(a) Soils: Their origin, structure, fertility, cultivation, and improvement.

(b) Field Crops: Their history, growth, culture, improvement and value.

(c) Irrigation and Drainage: The principles and methods of land drainage; the handling of land under irrigation.

(d) Farm Mechanics: The structures and machinery of the farm.

(e) Farm Management: Practical methods and systems for the operation of the farm under different conditions as a permanent money making business.

In every subject, instruction is accomplished equally through class room, laboratory, and field work; theory is checked by practice. For the latter methods of instruction, the finely equipped laboratories of this department, the various soil conditions, numerous experimental crops, and extensive structures of the Experiment

Station farm, offer excellent facilities. The large and newly equipped laboratories for the courses in Field Crops and the courses in Soils, in the new Agronomy Building, and for Farm Mechanics in the new Farm Mechanics building, are not excelled by those of any institution in the country.

The Secondary courses in Agronomy deal only with the practical application of the underlying principles of agriculture to specific conditions—aiming to give the less well prepared student as much information as possible in a short time concerning those practices most vital to successful farming—to send him back to the farm better prepared to cope with its problems. These courses serve also to prepare the student for collegiate Agriculture.

The object of the collegiate courses in this department is to give the student such mastery of all the subjects relating to the soil, field crops, rural engineering, or farm management, as will help prepare him for the highest type of practical farming, or for a successful career in professional agriculture, such as is found in the U. S. Department of Agriculture, or in the State Experiment Stations and Agricultural Colleges.

The farms of the Northwest offer even greater opportunities for men trained in knowledge of the soil, in the growing of crops and in irrigation and dry farming.

Agronomy 101 and 201 are prescribed for all collegiate agricultural students. The succeeding courses are the majors and minors offered to all upper classmen in Agriculture.

Those who elect Agronomy for their major work, may take any one of the following courses in Agronomy:

- (a) Regular Agronomy.
- (b) Soils (specialized course).
- (c) Crops (specialized course).
- (d) Irrigation Farming (specialized course).

Students majoring in Agronomy should confer with the head of the Department to arrange for taking any one of the specialized courses named. Liberal elections in other departments are permitted wherever advisable.

A. SOILS. A brief history of the origin of soils; the fertility of soils; the most valuable chemical constituents; their exhaustion and replenishment; the most important physical factors; their

101. **BASIC AGRONOMY.** This course is, of necessity, elementary and general in its nature—an introduction to agriculture—seeking to interest the new student in farm life through first knowledge of the fields, the crops, the mechanics of the farm; or in agriculture as a science, through the wide range of scientific study and explored; or to interest him in agriculture as a business, through its investigation it offers, the possibilities in the fields still unexplored as a practice, and its opportunities as a profession. During the semester, instruction is given in the elementary facts concerning the origin and formation of soils; soil moisture, heat and air; common soil processes, physical and chemical; plant foods and soil

fertility; tillage, crop rotation and manuring; important soil bacterial action; the benefits derived from drainage and irrigation; common farm machines, their use and care. The course will close with a brief survey of the agriculture of the State. Instruction will be given through lectures and notes, text and recitation, laboratory, and field observations.

Freshman year; first semester; three credits; two recitations; one laboratory period.

102. SOIL PHYSICS. Advanced study of the geology of soils, with their origin, formation, physical composition, and classification. Soil moisture and moisture movements and conservation. The various physical processes of the soil—surface tension, osmosis, capillarity, diffusion, etc. The effects of the various crops and the different methods of culture upon the texture, aeration, temperature, and moisture of the soil, and the resulting alteration in crop producing power. The influence of washing, drainage, and irrigation upon soils. Work in the laboratory will consist of the determination and comparison of such physical properties in the various soil types as, specific gravity, water retention, capillarity, organic content, etc., the physical effect of mulches, rotations, and cropping; soil sampling and judging; the mechanical analysis of soils.

The courses in Agricultural Chemistry, Agronomy, Animal Husbandry, and Irrigation Engineering; junior year; second semester; five credits; three recitations; two laboratory periods.

103. SOIL PHYSICS. Elective—Similar to 102, but shorter, dealing with the more important phases of the subject. Designed as an elective for agricultural students unable to take the regular course in Soil Physics.

Elective; junior year; second semester; three credits; two recitations; one laboratory period.

104. SOIL FERTILITY. The effect of the various crops upon the fertility of the soil. The maintenance or improvement of fertility by the use of fertilizers and manures. The composition and value of the different fertilizers and manures. The effect of different rotations upon fertility. The fertility of the different types of Oregon soils; their plant food requirements and compara-

tive values; methods of improvement of each. The effects of different systems of farming. Analysis, field plot, wire basket, and pot culture investigations.

Prerequisites: Agron. 102, Chem. 503.

Elective; senior year; first semester; five credits; three recitations; two laboratory periods.

111. **ADVANCED SOIL WORK.** The advanced student specializing in soils may study the various soil types of Oregon through mechanical analysis, and other physical tests; may undertake field work in soil surveying and mapping; or, through wire basket, pot culture, and field plot tests, may determine the effects of various systems of cropping, or fertilizing, or of soil bacteria, upon soil fertility.

Prerequisites: Agronomy 101, 102 and 104.

Elective; senior or graduate year; either semester or both; two to five credits.

Field Crops

201. **CROP PRODUCTION.** The study of the chief field-crop seeds of Oregon; wheat, barley, oats, corn, vetch, clover, alfalfa, grasses, etc., their vitality, germination, preservation, growth and reproduction; preliminary judging; seed bed and seeding; climate and soil; culture and rotation; weed enemies, their prevention and eradication; harvesting, marketing, and profits; distribution and value to the State; methods of crop improvement. Class room, laboratory and field work.

The course in Agriculture; freshman year; second semester; three credits; two recitations; one laboratory period.

202. **CEREAL CROPS.** A study of grains with special reference to those of Oregon and the varying conditions of soil and climate under which they are grown; the culture and rotation best adapted to each; the various methods of harvesting and storage; the judging of grain; grading for market; markets and uses of each crop; improvement of crop seed; plant breeding.

Junior year; first semester; five credits; three recitations; two laboratory periods.

NOTE.—In case adequate laboratory and green house room and equipment cannot be secured for this course, the laboratory work will be omitted—the lecture work only, given.

203. **FORAGE CROPS.** A less technical study of the legumes, grasses and succulent crops, the course being especially adapted to the needs of the students in Animal and Dairy Husbandry. The adaptability and value of each of the forage plants as pasture, hay, soiling, or silage crops, together with the practical methods of growing each and the planning of rotations that will maintain fertility, will be fully discussed.

The courses in Animal Husbandry, Dairy Husbandry and Irrigation Engineering; junior year; first semester; two credits; two recitations.

204. **CROP IMPROVEMENT.** A course dealing with the practical problems in the improvement of the quality and yield of the more important field crops, a knowledge of which would be necessary for the successful Oregon crop growers, especially those engaged in seed production. The different systems of breeding and the general principles of selection will be briefly discussed, and the best planting and culture methods for the breeding plots studied. The work will be largely in the laboratory and field.

Junior year; second semester; three credits; one recitation; two laboratory periods.

205. **AGROSTOLOGY.** A study of the grasses, legumes, and other forage crops. Methods of seeding for meadow, pasture, cover and soiling crops; maintenance of meadows and pastures; harvesting, curing, storing, baling, and using the various meadow crops; grazing, siloing, and soiling. The comparative structure of the different forage plants; as affecting growth and value adaptability to different conditions of climate. Examination of commercial seed for viability and purity. The identification of weed seed. The production of forage crop seed.

Elective; senior year; first semester; five credits; three recitations; two laboratory periods.

206. **ADVANCED CROP BREEDING.** A study of the laws, theories, and known facts concerning heredity, variation and evolution in plant life. The causes of variation, behavior of characters in transmission and the possibilities of inducing stability of character and establishing desirable types, will be discussed with special reference to field crop improvement.

Senior year; second semester; three credits; three recitations.

Prerequisite: Agronomy 7.

211. **ADVANCED CROP WORK.** In this subject, a complete study may be made of some special crop in which the student is interested or on which information is lacking. Methods of field experimentation may be compared and carried out; or plant breeding theories and their practical use in commercial seed production may be made the subject of investigation, or preparation for expert seed testing taken up.

Aside from these phases of advanced crop study, special one-hour lecture courses are offered (to groups of not less than five students) in each of the following specific subjects: Potatoes; Sugar Beets; Hops; Legume Seed Production.

Elective; senior or graduate year; first or second semester or both; one to five credits.

Drainage and Irrigation

301. **DRAINAGE AND IRRIGATION.** The history of drainage and of irrigation; road, field, and sanitary drainage on the farm; the different systems of drainage and of irrigation; methods of locating, installing, operating, and maintaining drainage and irrigation conduits; cost, efficiency, and profits; the effect on crops and soil; laws governing. Lectures, notes, readings, and field work.

The courses in Agronomy, and Dairy Husbandry ; junior year; second semester; three credits; two recitations; one laboratory period.

302. **IRRIGATION FARMING.** Methods of obtaining, distributing, and conserving irrigation waters. Handling of different crops under irrigation. Cost and profits thereof and duty of water in various districts of Oregon. Water rights and irrigation codes. Field and laboratory studies of irrigable qualities of different soils, laying out of irrigation systems, and field examination, where possible, of some of the largest projects in the State.

The courses in Irrigation Engineering and Irrigation Farming; junior or senior year; first semester; three credits; two recitations; one laboratory period.

Prerequisites: Agronomy 102 and 301.

303. CLIMATOLOGY. Practical meteorology; observing and recording local weather and forecasting; a study of the climate of Oregon and the effect of climate upon agriculture; class room and laboratory work.

Elective; junior or senior year; second semester; one credit; one laboratory period.

304. ADVANCED LAND DRAINAGE. A study of drainage problems and conditions in the field. The actual surveying, laying out, drafting of plans, estimation of cost, and installation of drainage systems at different points in the State, is required of students taking this course. A complete report for and of the organization of a drainage district is prepared by each class.

Elective; senior year; second semester; three credits; one recitation; two laboratory periods.

Prerequisites: Agronomy 301 and 102, and C. E. 231 and 236.

311. ADVANCED DRAINAGE AND IRRIGATION WORK. Under this head the student who has completed the courses offered may take up further study of special problems in either subject, such as the drainage of alkali lands, drainage against seepage, study of water table fluctuations, etc., or field studies of the irrigation of a certain crop region, conservation of irrigation waters, effect of irrigation on soil moisture conditions, etc.

Prerequisites: Agronomy 102, 301, and 302 or 304, and C. E. 231 and 236.

Elective; senior or graduate students; either semester or both; two to five credits.

Farm Mechanics

401. FARM MECHANICS. A study of the principles and practice having to do with draft in farm operations. Construction and use of modern field machinery for tillage, seeding, and harvesting operations and of farm pumps, wells, windmills, and stationary engines. Largely laboratory work in examining, setting up, testing, and operation of the field machines named.

Junior year; first semester; three credits; one recitation; two laboratory periods.

402. FARM POWER MACHINERY. The construction and operation of the more complicated machines used for threshing, grinding, cutting, etc., and comparative study of the different types of farm engines. Largely laboratory work in examing, setting up, testing, efficiency, and cost of operation, will be given attention.

Junior year; second semester; three credits; one recitation; two laboratory periods.

403. FARM MOTORS AND POWER MACHINERY. Investigation of the latest improvements and possibilities of the motors and power machinery used on the modern farm. Comparative tests for cost of operation and efficiency of farm stationary and traction engines and power machines. Manufacture and use of electricity on the farm. Operation of farm irrigation pumping machinery, etc.

Prerequisites: Agronomy 8 and 9.

Elective; senior year; first semester; three credits; one recitation; two laboratory periods.

404. FARM STRUCTURES. Farm buildings, fences, and roads. The design and construction of farm houses, barns, granaries, and silos; their arrangement and cost. The various kinds of fencing; cost, construction and quality. Road building and maintenance and cost of same. The laboratory will include practical work in concrete construction and the rough sketching of building plans and specifications.

Elective; junior year; first semester; two credits; one recitation; one laboratory period.

405. ORCHARD MACHINERY. The construction, proper adjustment, operation and efficiency of the machinery most commonly used in orchard work—tillage and seeding implements, gasoline engines, spray pumps, etc. Practice work also for those that require it, in plowing, methods of hitching, etc. This is a shorter course in Farm Mechanics especially adapted to the needs of horticultural students who cannot take the regular courses in Farm Mechanics. The work is given altogether from the mechanical standpoint—not from the standpoint of the horticultural applications or uses of the various machines.

Elective; juniors and seniors; second semester; two credits; two laboratory periods.

411. **ADVANCED FARM MECHANICS.** For the student with inclinations toward mechanics, a wide field is offered in advanced work in testing the efficiency and cost of running various types of farm power machines and engines; or of becoming expert on harvesting machinery; or in the designing of a complete series of farm buildings; or in practical work on cement construction for farm purposes, etc.

Elective; senior or graduate year; either semester or both; two to five credits.

Farm Management

501. **WEED ERADICATION.** A course designed for those specializing in crop production, dealing with methods of extermination of the more noxious or persistent weeds common to the United States and particularly Oregon.

Elective; junior or senior year; first semester; one credit; one recitation.

502. **DRY FARMING.** A study of the principles of moisture conservation. Special tillage methods and machinery. Dry farming crops and rotations. Occurrence and phases of the industry in Oregon and field excursions to the dry farming section.

Prerequisite: Agronomy 4.

Elective; junior or senior year; second semester; three credits; two recitations; one laboratory period.

503. **SEMINAR.** The preparation and discussion of papers or demonstrations on subjects of especial Agronomic interest. Inquiry into the development of different phases of the science at home and abroad. Joint fortnightly meetings open to all agricultural students.

Junior year; second semester; one credit; one recitation.

504. **SEMINAR.** Senior year; second semester; one credit; one recitation.

505. **FARM MANAGEMENT.** A study of the various systems of extensive, intensive, and mixed farming, and the conditions under which each prospers or fails; methods of successful farmers; the application of business methods to farm operations; farm capital; farm labor; economic management of fields, stock, structures, crops, and machines; markets and marketing; relation of farming to other industries.

Elective; senior year; second semester; three credits; three recitations.

511. **ADVANCED FARM MANAGEMENT.** There is a rapidly growing demand for men of special knowledge in the management of farms or of farming areas of distinct types where ordinary methods of crop production, crop rotations, and profit making do not suffice. In this course advanced study is made of different farming systems or the management of special types of farming, such as dry land or irrigated areas, swamp or dyked lands, etc.

Elective; senior or graduate year; either semester or both; two to five credits.

ANIMAL HUSBANDRY

Professor Withycombe

Professor Potter

Mr. Samson

Mr. _____

Mr. _____

The object of the course in Animal Husbandry is to fit the student for the actual rearing of live stock on the farm so that he may raise the highest grade of stock in the most economical manner. The student is thoroughly grounded in the underlying principles so that he may successfully continue his study after he leaves school, but the practical details are thoroughly discussed and a special effort is made to keep the student in close touch with the financial phases of the live stock industry. Students who take this work as their specialty are not expected to devote their entire time to live stock, but are to familiarize themselves with the production of the common farm crops, maintenance of the fertility of the soil, and the handling of farm machinery and like topics; so that when they graduate, they will be equipped for practical farm work.

Scientists and practical farmers are agreed that the fertility of the soil cannot be maintained economically, if at all, without live stock. The rearing of live stock requires more skill and knowledge than grain or hay farming; and while the profits are much larger

when the business is properly handled, there is also more danger of a loss due to improper management or ignorance; hence the necessity of a thorough training before embarking in this line of work.

The following courses are offered:

A. STOCK JUDGING. A study of animal form by score practice and comparative judging. The student is given an understanding of various points to be considered in judging cattle, sheep, swine, and horses. The work consists almost exclusively of actual practice with the animals at the college barns.

The Secondary course; first year; first semester; two credits; two laboratory periods.

C. PRACTICAL STOCK FEEDING. A study of the elementary principles of stock feeding. The various feed stuffs obtainable in Oregon are discussed and compared as to their value for the different kinds of stock. Some time is devoted to the different methods of preparing the feed and the various systems of feeding. This course is offered not only in the Secondary Course in Agriculture, but is recommended as an elective for special students who are not in a position to take Animal Husbandry 7 and 21.

The Secondary Course; second year; second semester; three credits; three recitations.

1. STOCK JUDGING. The various types of farm animals are studied by the score card method and by comparative judging. Practically the entire time is devoted to studying the animals at the barns. The student is made familiar with the desirable types of cattle, sheep, swine, and horses.

Freshman year; second semester; two credits; two laboratory periods.

2. LIVE STOCK MANAGEMENT. A careful study of the practical details of the care and management of live stock; stabling; grooming; sanitation; practical feeding, and kindred details of live stock farming.

Sophomore year; second semester; two credits; one recitation; one laboratory period.

3. BREEDS OF STOCK. The study of the history of the various breeds of cattle and sheep, their origin and characteristics. Each

breed is taken up and studied separately from its early history. The environment under which they were produced, the original stock, and the men who were instrumental in establishing the breed are given careful consideration, as well as the present status of the breed and the work of present day breeders. The leading families or strains and the most prominent animals are discussed in detail. The lecture work is accompanied by comparative judging in which special attention is given to breed type and to the differences in conformation of the various breeds.

Prerequisite: A. H. 1.

Junior year; first semester; four credits; two recitations; two laboratory periods.

4. BREEDS OF STOCK. The study of the breeds of horses and swine. A continuation of A. H. 3.

Prerequisite: A. H. 1.

Junior year; second semester; four credits; two recitations; two laboratory periods.

5. LIVE STOCK MARKETING. The study of the various problems of marketing live stock; preparation of stock for market; shipping; market grades and classes; market terms and reports; together with a detailed study of the leading markets open to the farmers of Oregon.

Prerequisite: A. H. 1.

Junior year; first semester; three credits; three recitations.

6. PRINCIPLES OF BREEDING. The study of the principles of breeding as related to the development of our domestic animals. Among the topics discussed are variation, transmission of variations and modifications, fecundity, in-breeding, crossing, and like topics. Some time is devoted to the study of pedigrees and to the methods of registration employed by the various breeds associations.

Prerequisite: At least one semester of Zoology.

Senior year; first semester; three credits; three recitations.

7. PRINCIPLES OF STOCK FEEDING. The study of the chemical and physiological principles of animal nutrition including digestion, assimilation, metabolism and also the composition of feed stuffs and the function of the various classes of compounds found in feed

stuffs in the animal body. Special attention is devoted to the study of nutritive ratios, feeding standards, compounding rations, and the general significance of the chemical composition of the feeds.

Prerequisites: Chemistry 500 and 501.

Senior year; first semester; two credits; two recitations.

13. RESEARCH WORK. In this course the student is expected to select some line for individual investigation either by library methods or otherwise. The object is partly to allow the student to study some particular line in which he is especially interested and partly to give him training in studying out problems for himself as he will have to do after leaving school. This course is open only to those who are taking Animal Husbandry as their major or who have taken practically all of the regular courses in Animal Husbandry.

Elective; senior year; second semester; credits according to arrangement.

16. ADVANCED STOCK JUDGING. This course consists of practical judging of all kinds of live stock with occasional trips to fairs and stock farms. Judging teams for the Pacific International Stock Show will be chosen from the class.

Prerequisites: At least two semesters of stock judging. Senior year; first semester; two credits; two laboratory periods.

17. ADVANCED STOCK JUDGING. A continuation of course 16.

Senior year; second semester; two credits, two laboratory periods.

18. SEMINAR. Semi-monthly meetings are held in which papers on Animal Husbandry subjects are read and discussed. These papers are prepared under the supervision of the department, although considerable latitude is allowed in the selection of subjects and the manner of presentation.

Elective in junior and senior years; first semester; one credit.

19. SEMINAR. This is a continuation of course 18.

Second semester; one credit.

21. FEEDS AND FEEDING. An advanced course in the feeding of horses, beef cattle, sheep, and swine. In this course the students are given a thorough training in the most approved methods of stock

feeding. An especial study is made of the practices of the best stockmen and of the investigations carried on by the various experiment stations. This course follows Animal Husbandry 7 and will be open only to students who have completed that course. Students desiring to take only such parts of the course as relate to certain lines of live stock will be permitted to do so by arrangement with the head of the department.

Prerequisite: Animal Husbandry 7.

Senior year; second semester; five credits; five recitations.

23. FEEDS AND FEEDING. This is a condensed course intended for those students who do not have the time necessary for courses 7 and 21. The feeding of beef cattle, sheep, hogs, and horses is studied with reference to both principles of nutrition and farm practice. While brief, the work is complete in itself and does not depend upon any other course.

Elective to seniors in all agricultural courses except Animal Husbandry; second semester; three credits; three recitations.

25. LIVE STOCK PRACTICE. This is a course in the details of live stock management, taking up the subject in a more advanced form than in Animal Husbandry 2. The laboratory hour will be devoted to such work as dipping, dehorning, hoof trimming, shearing, horse training, and other common operations of the stock farm.

Elective to Junior Animal Husbandry students; second semester; two credits; one lecture, one laboratory.

DAIRY HUSBANDRY

Professor —————

Mr. Simpson

Mr. Stockwell

With increase in values of land, comes a need for more intensive methods of agriculture. Dairying is one of the few industries that can be made profitable on high priced lands. The more valuable the lands to be utilized for dairy purposes, the greater the need for the application of scientific principles, both in milk production and dairy manufacturing lines.

In order to meet the needs of the industry and the demand for information, the department offers the following courses:

(a) The four-year course, designed to qualify students for agricultural college and experiment station work, for inspectors of dairy products and dairy establishments in city, state, or government service, or as managers of creameries or large dairy farms.

(b) A half-year course extending through the first semester, designed to fit students to become operators of creameries, cheese factories, and dairy farms. Students entering this course must be not less than eighteen years of age, and have a knowledge of English and Mathematics equal to eighth grade public school requirements.

(c) A winter short course of four weeks, giving special attention to the subject of milk production.

(d) A winter short course of one week for experienced factory men.

Besides these courses, dairy instruction will form a portion of the work offered to students in the Secondary Course in Agriculture, and to students in Domestic Science and Art.

The laboratories and class rooms for the technical work in dairying are located in the new three-story Dairy Building, completed in 1912. The building is well equipped for giving instruction along all lines of dairy manufactures, except milk condensing. Milk and cream are handled on a commercial scale, thus enabling the student to approach closely the conditions existing in actual creamery practice. Various kinds of appliances are available for the different operations, thus giving the student an opportunity to judge at first hand the respective merits of such appliances.

The Dairy Herd, which is used for experimental and demonstration purposes, consists of typical representative animals of the leading dairy breeds, including the Jersey, Guernsey, Holstein and Ayrshire.

One of the largest commercial creameries in the State is located in Corvallis, an opportunity thus being afforded for the study of manufacturing problems as they exist under every-day-creamery conditions.

The following courses are offered:

A. **PRINCIPLES OF DAIRYING.** A general study of the secretion and composition of milk; care of milk and cream on the farm; methods of separation and testing for fat; butter making on the farm.

The secondary course; second year; first semester; two credits; one recitation; one laboratory period.

B. **DAIRY METHODS.** The secretion and composition of milk; Babcock test for milk and milk products; separation; ripening and churning cream; preparation of starters; creamery management.

The one semester course; daily lectures and recitations. Five credits.

C. **DAIRY PRACTICE.** Laboratory exercises in the use of the Babcock test, as applied to milk and milk products; acidity, salt, and moisture tests; separating, ripening, and churning cream, with special reference to factors affecting "overrun", starters and pasteurization.

The one semester course; two to four hours per day, four days per week. Four credits.

1. **FARM DAIRYING.** Composition of milk; application of the Babcock test to milk and milk products; selection of the dairy breed; farm dairy appliances; disposal of the product; churning, packing, and marketing butter; farm cheese making; utilization of dairy by-products.

Sophomore year; second semester; three credits; two recitations; one laboratory period.

2. **DAIRY INSPECTION.** Application of the Babcock test; use of the lactometer in detecting adulterations; rapid tests for various preservatives and adulterations; the score card system of dairy inspection; score card judging of butter, cheese and other dairy products.

Prerequisite: D. H. 1.

Required of students electing Dairy Husbandry as a major; junior year; first semester; two credits; one recitation; one laboratory period.

3. **BREEDS OF DAIRY CATTLE.** Origin, characteristics, and adaptability of the various breeds of Dairy Cattle. Judging representa-

tive animals of the various breeds according to official standards. Comparative judging within the breeds. Consideration of prominent individuals and families in each breed.

Prerequisite: An. H. 1, 2; D. H. 1.

Required in the course in Milk Production; junior year; first semester; three credits; two recitations; one laboratory period.

4. DAIRY FARM EQUIPMENT. Plans and specifications for dairy barns, milk houses, and other farm dairy buildings. Kind and number of animals for a given area. Dairy machinery and appliances required, and installation of same.

Prerequisite: D. H. 1.

Required in course in Milk Production; junior year; second semester; three credits; three recitations.

5. CITY MILK SUPPLY. Problems concerning the production and distribution of milk for town and city retail trade. Production of "certified milk." Pasteurization as applied to market milk.

Prerequisites: D. H. 1; Bacteriology 401.

Required in the course in Milk Production; senior year; second semester; two credits; two recitations.

6. SEMINAR. The study of new experiment station bulletins, books, and general dairy periodicals. Problems of milk production as related to dairy manufactures.

Prerequisite: D. H. 1.

Required in Dairy Husbandry courses; senior year; second semester; one credit.

7. DAIRY HERD MANAGEMENT. Best methods of feeding for milk production; principles governing the construction of stables, stalls, and ties; systems of keeping, feeding, breeding, and milk production records; manner of disposal of milk produced; rearing the dairy calf; selection and care of bulls.

Prerequisites: D. H. 1; Chemistry 500, 501.

Required of students in Dairy Husbandry. Elective for students in Animal Husbandry and Agronomy. Senior year; second semester; three credits; three recitations.

9. THESIS. Original work on some dairy subject may be worked out in co-operation with the departments of Chemistry, Bacteriology, or Animal Husbandry. Students should consult the head of the

Dairy Department concerning Thesis subject not later than the beginning of their senior year.

Required of students electing Dairy Husbandry as a major; senior year; second semester; two credits.

10. **ADVANCED BUTTER MAKING.** A study of the physical and chemical properties, composition and separation of milk; effect of different degrees of acidity of cream upon the resulting butter; the principles of churning, packing and marketing butter; and the operation of churns and separators.

Prerequisites: D. H. 1; Chemistry 500, 501.

Required in the course in Dairy Manufactures; junior year; first semester; five credits; three recitations; two laboratory periods.

11. **CHEESE MAKING.** A study of the importance of quality and composition of milk in the manufacture of Cheddar cheese; the principles involved in setting, cutting, heating, milling, etc.; special shapes and sizes; the construction and ventilation of curing rooms.

Prerequisites: D. H. 1; Chemistry 500, 501.

Required of students in the course of Dairy Manufactures; junior year; second semester; three credits; two recitations; one laboratory period.

12. **DAIRY MACHINERY.** Theory and construction of steam boilers and engines; refrigerating machinery; separators, ripeners and pasteurizers. Some practice in Engineering shops.

Prerequisites: D. H. 1, 10.

Required in course in Dairy Manufactures; senior year; first semester; two credits; one recitation; one laboratory period.

13. **FACTORY MANAGEMENT.** Consists of location, organization, construction, drainage, and ventilation of creameries and cheese factories; creamery refrigeration, and general management. The object of this course is to fit the student to superintend or manage large factories or other dairy establishments.

Prerequisites: D. H. 1, 10.

Required in course in Dairy Manufactures; senior year; first semester; three credits; three recitations; inspection of dairy establishments.

14. **TECHNOLOGY OF MILK.** A study of the utilization of milk and its products, such as the preparation of condensed, certified,

modified, and hygienic milk, milk sugar, casein; the food value of milk and its products.

Prerequisites: D. H. 1, 2; Chemistry 500, 501.

Required in the course in Dairy Manufactures; senior year; second semester; two credits; two recitations.

15. ICE CREAM AND ICES. A study of the preparation of ice cream, sherbets, and ices, made on a private or commercial scale.

Prerequisite: D. H. 1.

Elective; senior year; second semester; one credit; one recitation or laboratory.

16. HOME DAIRYING. A study of the secretion, composition, and characteristics of milk; methods of separation; care of milk and cream; preparation of ice cream and ices.

Elective in the course in Domestic Science and Art, after the freshman year; second semester; two credits; recitations and laboratory.

HORTICULTURE

Professor Lewis

Associate Professor Gardner

Associate Professor Peck

Assistant Professor Bouquet

Assistant Professor Kraus

Mr. Brown

Mr. Bradford

Mr. Speidel

Mr. Lafky

Mr. Masterton

The scope of work in Horticulture is very broad, giving instruction in Pomology, Olericulture, Floriculture, Landscape Gardening, and School Gardening. In these courses the student is first thoroughly grounded in the fundamentals and is then allowed to specialize as he may desire. Thus, he may fit himself for station or government work, or enter the many lines in business open to

him, such as fruit growing, truck gardening, floriculture, or landscape gardening; for in all these lines are splendid opportunities throughout the Pacific Northwest. At the present time there are openings for young men to become managers of orchards or to develop fruit lands for outside investors; those having a taste for teaching, can find a broad field in college or rural work or as supervisors of horticulture. The required work for students electing horticulture covers a wide range, giving the student a thorough training, not only in plant propagation and the general principles of orchard management and vegetable growing, but in floriculture and landscape gardening as well, thus broadening his views and interesting him in the aesthetic and all that pertains to more beautiful surroundings.

The courses consist of lectures, reference reading, field exercises, and laboratory work. Much stress is placed upon the practical phases of all the work. In all courses horticultural truths are illustrated by practice whenever possible. Students are given field and laboratory exercises in all such phases as planting, seeding, budding, grafting, cultivating, thinning, pruning, harvesting, and spraying.

The Horticultural Building contains modern laboratories for spraying, plant propagation, fruit packing, systematic pomology and vegetable preparation. There are special classrooms, large drafting rooms, museum, and research laboratories. A new floriculture building and range of greenhouses assist materially in the work. The department is also establishing young orchards and vegetable gardens and has at its disposal a large campus upon which are planted many species of trees and shrubs. Large additions have been made recently to the library.

A. ELEMENTARY ORCHARD PRACTICE. A course dealing with the first principles of fruit growing, in which the practical phases are emphasized, stress being laid on such phases of orcharding as harvesting, packing, pruning, spraying, establishing of orchards, and the essentials of small fruit culture.

The Secondary course; first year; first semester; two credits; one recitation; one laboratory period.

B. ELEMENTARY ORCHARD PRACTICE AND VEGETABLE GARDENING. In this course the requirements of the secondary student are kept in mind, the work leading up to more advanced courses in the freshman and sophomore years. The propagation of the common plants used in horticulture is studied and practical laboratory exercises are given in the planting of seed, making of cuttings, and the ordinary methods of budding and grafting. The last part of the semester is devoted to a study of the first principles of vegetable gardening.

The Secondary course; first year; second semester; three credits; two lectures; one laboratory period.

1. PLANT PROPAGATION. This course consists of a very thorough study of the propagation of plants used in horticulture, including study of soils used in nursery and seed bed; seeding and transplanting; multiplying of plants by separation and division, soft and hard wood cuttings, layerings, and many forms of budding and grafting. The greenhouses, laboratories, orchards, and campus offer splendid opportunities and furnish abundant material for practical work.

Sophomore year; second semester; two credits; one recitation; one laboratory period.

2. ORCHARD AND GARDEN PRACTICE. Problems concerning the home orchard and garden are dealt with in this course, the aim being to give those students who cannot further pursue a horticultural course the necessary training to develop ideal home orchards and gardens; at the same time the work is fundamental for students desiring to pursue horticultural studies further. The common orchard and garden problems such as selecting a site, setting and cultivating the orchard and garden, pruning, spraying, and choosing varieties are considered.

Sophomore year; first semester; three credits; two recitations; one laboratory period.

3. FLORICULTURE. An elementary course in the cultivation of greenhouse and home plants and of the common annuals and perennials used in outdoor work. The course is designed to broaden the views of those students who are unable to take advanced courses in Floriculture, and to make them more useful citizens.

Required of Agricultural juniors electing Horticulture as a major; first semester; two credits; one recitation, one laboratory period.

4. LANDSCAPE GARDENING. All students should be interested in everything that pertains to the decoration of the home, the improvement of school grounds, the beautifying of streets, and the establishment of recreation grounds and parks. In the course in landscape gardening the general principles of this art are so treated as to apply to the upbuilding of the aesthetic in everyday life.

Required of Agricultural juniors electing Horticulture as a major; second semester; two credits; one recitation; one laboratory period.

Pomology.

11. PRACTICAL POMOLOGY. Especially offered for those students desiring training in commercial orcharding; deals largely with problems connected with the growing and handling of our leading fruits. Such problems as choice of soil, cultivation, irrigation, use of cover crops, thinning, proper varieties, and best methods of orchard management, will be thoroughly studied. This is purely a lecture course, the laboratory work being offered in courses 12 and 13.

Required of juniors electing Pomology as a major; first semester; three credits; three recitations.

12. ORCHARD PRACTICE. A Saturday morning course, dealing only with the practical phases of orchard management. The various orchard problems, such as harvesting, packing, pruning, spraying, and the handling of small fruits, are taken up according to season. Every student beginning this work is required to become familiar with fruit packing to the extent that he can put up a first-class box of fruit. Students especially proficient will be allowed to take up outside work for remuneration under departmental supervision.

This course is open only to juniors and seniors electing Horticulture, Botany, and Entomology as a major.

Required of students majoring in Pomology; first semester; two credits; two laboratory periods.

13. ORCHARD PRACTICE. This is a continuation of course 12.

Required of students majoring in Pomology; second semester.

15. GRAPE GROWING. A special course in Viticulture devoted to the best methods of growing, harvesting, and packing the American and European types of grapes. Such phases as exposure, elevation, soils, use of resistant stock, pruning, harvesting, packing, shipping, and storing are included. The manufacture of byproducts will also be treated.

Elective; junior year; second semester; two credits; two recitations.

16. SMALL FRUIT CULTURE. In this course a study is made of the problems concerned with the growing and marketing of such fruits as the strawberry, currant, gooseberry, raspberry, blackberry, loganberry, and cranberry. A large collection of small fruits in the college orchard aids materially in the study.

Elective; junior year; second semester; two credits, one recitation; one laboratory period.

17. NUT CULTURE. Nut culture is becoming a very important branch of Horticulture. In this course a special study will be made of the culture of such nuts as the walnut, filbert, almond, pecan, and peanut. Instruction is very largely by lectures on the special adaptability of the Pacific Coast to nut culture. Laboratory periods will be given on most successful methods of grafting nuts.

Elective; junior year; second semester; two credits; one recitation; one laboratory period.

18. SYSTEMATIC POMOLOGY. The description, nomenclature, and classification of native and sub-tropical fruits and nuts is studied. In addition, training is given in judging and displaying fruits. Special stress will be laid on the variation of fruits caused by soil, elevation, etc. For this study fruits will be collected from the various parts of the State.

Required of seniors electing Pomology as a major; senior year; first semester; four credits; two recitations; two laboratory periods.

19. COMMERCIAL POMOLOGY. This course deals with the problems of marketing fruits, methods of packing, transportation, and storage, the building of packing and storage houses. A study of associations as a factor in the handling of fruit, of market

requirements, and of the handling of by-products, makes this course decidedly valuable.

Required of seniors electing Pomology as a major; senior year; second semester; two credits; two recitations.

20. SEMINAR. This is a course especially arranged for senior and graduate students in Horticulture. A study is made of some of the advanced problems. Articles from the leading magazines on horticultural subjects, as well as station and government publications, are reviewed. A course of lectures and class drill is given in outlining and conducting experiments and investigations.

Required of Agricultural seniors and advanced students having their major in Horticulture; senior year; first semester; one credit; one recitation.

21. SEMINAR. Required of Agricultural seniors and advanced students having their major in Horticulture.

Required of seniors electing Pomology as a major; senior year; second semester; one credit; one recitation.

22. HISTORY AND LITERATURE OF HORTICULTURE. A study is made of the literature and history of Horticulture from the time of the Egyptians to modern times.

Required of seniors electing Pomology as a major; senior year; first semester; two credits; two recitations.

23. PLANT BREEDING. This course embraces a study of the theories as related to plant breeding and their application to the practical aspects of the work, such as cultivation, selection, acclimatization, hybridizing, and pollination. Lectures, reference reading, and practical problems given in laboratory and field. Juniors electing this course begin orchard and garden investigation and plant breeding that can be continued during the senior year.

Elective; junior and senior year; first semester; three credits; two recitations; one laboratory period.

24. ADVANCED PLANT BREEDING. Largely a laboratory course in greenhouses, orchards and gardens. Open only to students who have completed Horticulture 23. Practical problems of plant breeding studied in course 23 will be continued in this course.

Senior year; second semester; three credits; one recitation; two laboratory periods.

25. **SUB-TROPICAL POMOLOGY.** A study of the culture of such sub-tropical fruits as oranges, figs, and olives.

Elective; senior year; first semester; two credits; two recitations.

26. **ADVANCED POMOLOGY.** This is in the nature of a finishing course in Pomology. It will include a series of examinations covering the subject of Pomology, to test the student's knowledge of this subject.

Horticultural topics that have not been treated fully in previous classes will be taken up for special consideration in this course. The latter part of the course will deal purely with the study of orchard economics, including cost of development and maintenance of orchards, and the cost of selling the crop.

Elective; senior year; second semester; three credits; three recitations.

Vegetable Gardening.

Students taking their major in this course are required to take Horticulture 3, 4.

31. **PRINCIPLES OF VEGETABLE GARDENING.** In this course a study is made of the history and botanical relationship of vegetables, problems of vegetable soils and locations, tillage, crop successions, and rotations, irrigation, application of manures, and commercial fertilizers, seeds and seed sowing, transplanting, construction and operation of hot-beds, implements, capital and labor and other vital problems connected with the handling of a vegetable garden.

Required of juniors electing Vegetable Gardening as a major; junior year; first semester; three credits; two recitations; one laboratory period.

32. **FORCING VEGETABLES.** A course dealing with the problems connected with forcing of such vegetables as lettuce, cucumbers, tomatoes, rhubarb, and melons, in cold frames, hot-beds, and greenhouses. Lectures and exercises in the greenhouses.

Required of seniors electing vegetable gardening as a major; senior year; second semester; two credits; one recitation; one laboratory period.

33. **FORCING VEGETABLES.** Continuation of course 32.

Required of seniors electing vegetable gardening as a major; senior year; first semester; two credits; one recitation; one laboratory period.

34. **SYSTEMATIC OLERICULTURE.** Description, nomenclature, and classification of vegetables. Exercises are given in displaying and judging vegetables.

Required of senior students electing Vegetable Gardening as a major; senior year; first semester; one credit; one laboratory period.

35. **TRUCK GARDENING.** Only the purely commercial aspects of vegetable gardening are offered in this course. Such phases as capital, labor, rotation, tools, harvesting, and storing will be considered, as well as other problems involved in the growing of vegetables on an extensive scale for market or cannery. Attention is also paid to a study of vegetable markets and methods of marketing.

Required of senior students electing Vegetable Gardening as a major; senior year; first semester; three credits; two recitations; one laboratory period.

36. **COMMERCIAL TRUCK GARDENING.** A continuation of course 35.

Required of senior students electing Vegetable Gardening as a major; three credits; two recitations; one laboratory period.

37. **PRACTICAL VEGETABLE GROWING.** This course is especially designed for those who are specializing in vegetable growing and for those who wish to obtain knowledge concerning the most practical methods of growing all the important market garden crops. The work will consist largely of practicums in field and greenhouse, supplemented by lectures; and all commercial garden crops will be handled, from seed time onward, in such a way as to give the student a thorough working knowledge of growing leading vegetable crops.

Required of juniors electing Vegetable Gardening as a major; three credits; two lectures; one laboratory period.

Landscape Gardening

39. TREE SURGERY. The principles of tree surgery are presented and put into execution in the laboratory.

All the varying cuts, cavities, fillings, bracing, and cultivating will be worked out in a practical manner.

Elective; junior year; first semester; one credit; one laboratory period.

40. TREE SURGERY. A continuation of course 39.

Elective; junior year; second semester; one credit; one laboratory period.

43. PLANT MATERIALS. To create satisfactory landscape effects, one must have a broad knowledge of the materials with which landscape architects must work. A thorough study is given to trees, both evergreen and deciduous, shrubs, vines, perennial herbaceous plants, biennials and annuals, with a view to bringing out their characteristics, such as foliage, color, form, adaptation, hardiness and artistic effect.

Prerequisite: Horticulture 4.

Elective; junior year; first semester; three credits; one recitation; two laboratory periods.

44. PLANT MATERIALS. A continuation of course 43.

Elective; junior year; second semester; three credits; one recitation; two laboratory periods.

45. THEORY AND DESIGN. This course includes a study of the best works of prominent landscape architects, together with a wide range of collateral reading bearing upon the various problems. Private estates, public parks and play grounds, boulevards, and cemeteries will be carefully studied. Reports, such as those of park boards and landscape architects will also be studied.

Prerequisites: Horticulture 4, 43, 44.

Elective; senior year; first semester; two credits; two laboratory periods.

46. THEORY AND DESIGN. A continuation of course 45, in which a large portion of the time will be devoted to the preparation of planting plans. Outside time will be required for collateral reading.

Prerequisites: Horticulture 4, 43, 44, 45.

Elective; senior year; second semester; three credits; three laboratory periods.

47. FIELD PRACTICE. A course in practical problems brought in from the field of practice. The student is required to make the surveys, do the engineering work incidental to the solving of the problem, make general plans, planting plans, grading plans, details, and, in short, perform all the duties ordinarily met with in the landscape architect's office.

Prerequisites: Horticulture 4, 43, 44, Civil Engineering required in freshman and sophomore year.

Elective; senior year; first semester; three credits; three laboratory periods.

48. FIELD PRACTICE. A continuation of course 47.

Prerequisites: Horticulture 4, 43, 44, Civil Engineering required in freshman and sophomore year.

Elective; senior year; second semester; three credits; three laboratory periods.

49. HISTORY AND LITERATURE OF LANDSCAPE ARCHITECTURE. A course designed to give the student a good idea of the development of the art and to bring him into close touch with the literature, past and current, that is related to the subject.

Elective; senior year; second semester; two credits; two recitations.

50. TOWN PLANNING. This course is offered in order that the student may understand, in a general way, the underlying ideas of municipal, town, and village improvement. Literature and reports are studied, town problems discussed, and methods of procedure in town improvement worked out.

Elective; senior year; first semester; three credits; two recitations; one laboratory period.

Floriculture

Students taking their major in Floriculture are required to take Horticulture 3, 4.

51. GREENHOUSE CONSTRUCTION. A course especially adapted for students specializing in Floriculture and Truck Gardening.

The problems connected with the building of greenhouses, hot-beds, and cold frames are dealt with; also, selection of materials; the various systems of heating and ventilating, and the value of the various types of buildings. Lectures and laboratory exercises in greenhouse and drafting room are conducted.

Elective; junior year; second semester; three credits; one recitation; two laboratory periods.

52. **FORCING FLOWERS.** In this course are studied the propagation, and problems of culture, such as soils, ventilation, and heat, connected with the forcing of plants used in the florist's trade.

Prerequisite: Horticulture 3.

Elective; senior year; first semester; three credits; one recitation; two laboratory periods.

53. **FORCING FLOWERS.** This is a continuation of Horticulture 52.

Elective; senior year; second semester; three credits; one recitation; two laboratory periods.

54. **FLORICULTURE.** Instruction is given in various subjects; such as proper soils, planting of seed, transplanting, making of cuttings, cultivation, principles of heating and ventilating, control of insect pests and diseases, connected with the cultivation of the common household and dooryard flowers. In addition, such problems as the grouping and arranging of flowers, so as to obtain the best color harmonies and most pleasing effects while growing, as well as for decoration purposes, are included. The lectures are supplemented by reference readings and laboratory periods in the greenhouse and garden.

Course in Domestic Science and Art; junior year; first semester; two credits; one recitation; one laboratory period.

55. **LANDSCAPE GARDENING.** The general principles of Landscape Gardening are taught, the aim being to give the student sufficient foundation to understand landscape gardening as applied to home decoration, to interest the student in the home beautiful, the improvement of our public school grounds and city and village streets. A study is made of photographs, and of famous landscape paintings, showing good taste and design in various phases of Landscape Gardening. Lectures and reference readings are supplemented by field exercises.

Course in Domestic Science and Art; second semester; two credits; one recitation; one laboratory period.

56. **VEGETABLE GARDENING AND SMALL FRUIT CULTURE.** In this course such problems as care of soil, seeding, rotation, fertilizing, and the selection of the best varieties of vegetables and small fruits for use in the home garden are considered. Lectures, laboratory and field exercises.

Course in Domestic Science and Art; second semester; three credits; two recitations; one laboratory period.

By-Products

61. **HORTICULTURAL BY-PRODUCTS.** This course embraces a general study of horticultural by-products, including a study of the growth and development of this important industry in this country and abroad, but more especially in the Pacific Northwest. It will deal with the establishment of plants, their operation, and the fundamental principles connected with canning, evaporating, drying, and the manufacture of fruit juices.

Elective; junior or senior year; first semester; one credit; one recitation.

62. **DRIED PRODUCTS.** This course will take up a detailed study of the evaporation and drying of fruits and vegetables. It will include a study of the types of buildings now used, and of the machinery and apparatus needed in the successful operation of the various types of driers. This course will also deal with the technique connected with the evaporation and drying and processing of such products as apples, pears, peaches, apricots, berries, and vegetables.

Elective; junior or senior year; first semester; three credits; one recitation; two laboratory periods. Not offered in 1913-14

63. **CANNING.** This course embraces a study of the establishment, management, and operation of canneries, including a study of necessary buildings and machinery, and successful operation of canneries. It will also include a detailed study of the various methods used in canning, and in the manufacture of syrups, jellies, etc.

Elective; junior or senior year; second semester; three credits; one recitation; two laboratory periods. Not offered in 1913-14.

64. **FRUIT JUICES.** This course will embrace a study of the manufacture of cider, vinegars, and juices of such fruits as the apple, grape, and loganberry. A study will be made of various types of buildings and machinery suitable for the manufacture of such juices, together with a study of the best methods embraced in the manufacture of fruit syrups and juices.

Elective; junior or senior year; first semester; three credits; one recitation; two laboratory periods. Not offered in 1913-14.

Research

The Division of Horticulture is unusually well equipped for offering research work. In addition to the laboratory facilities, there are the greenhouses, experimental plots, and a splendid research library well supplied with scientific books and periodicals, all of which combine to give the student unsurpassed facilities.

71. **RESEARCH WORK FOR SENIORS.** This course is offered for those seniors who are contemplating following college, experiment station, or government work as a life work, or for those students who desire to have some special training in research technique. Problems will be assigned to the students which will give them experience in the laboratory, greenhouse, field, and library.

Elective; senior year; first semester; three credits.

72. **RESEARCH WORK FOR SENIORS.** A continuation of course 71.

Elective; senior year; second semester; three credits.

73. **ADVANCED THESIS AND RESEARCH WORK.** This is a course offered only for graduate students. Such students will be allowed to select problems in pomology, vegetable gardening, landscape gardening, floriculture, plant breeding, and similar subjects.

Elective; for graduate students only; first semester; from 10 to 20 credits.

74. **ADVANCED THESIS AND RESEARCH WORK.** Continuation of course 73, second semester.

75. **METHODS OF RESEARCH.** This course is offered to graduate or senior students interested in research work. It will be conducted as a research round table. Special drill will be given in the making of briefs and outlines of research problems, in methods of procedure in conducting investigative work and in the preparation of bulletins and reports. The study of research problems conducted by the Division of Horticulture will be taken up and a close study made of the research work which is presented in bulletins from other institutions.

Elective; senior or graduate year; first semester; one credit.

76. **METHODS OF RESEARCH.** Continuation of course 75.

Elective; senior or graduate year; second semester; one credit.

POULTRY HUSBANDRY

Professor Dryden

Assistant Professor Lunn

Mr. _____

In recognition of the importance of the poultry industry, and to meet the demands of young men who aim to give special attention to this industry after leaving college, a department of Poultry Husbandry was established. Poultry-keeping is a part of every well regulated system of diversified farming, and at the same time offers opportunities for profit-making as a special business under special conditions. The plant at the College gives exceptional opportunities for study of the practical, as well as the theoretical, side of the poultry industry.

1. **POULTRY HUSBANDRY.** Includes a study of breeds of domestic poultry, their history and classification. Laying and market qualities of different breeds will be emphasized. Breeding fowls for different purposes will be considered, as will the location and construction of the poultry plant and its equipment. Laboratory work consists of practice in judging, preparing poultry products for market, constructing houses, coops, poultry plant equipment, and drawing of plans.

Required of all juniors in Poultry Husbandry; junior year; first semester; four credits; two recitations; two laboratory periods.

2. **POULTRY HUSBANDRY.** A continuation of course 1, but may be taken separately. Includes a study of poultry feeds and feeding with reference to egg and meat production. Reproduction by natural and artificial methods. Markets and marketing. Laboratory work consists of a study of poultry food stuffs and rations. Students will be given practice in preparing different rations. Practice will also be given in hatching and brooding. Each student will have charge of a pen of fowls, and during his period of management will do all the feeding and keeping of records.

Required of all juniors in Poultry Husbandry; junior year; second semester; four credits; two recitations; two laboratory periods.

3. **ADVANCED POULTRY HUSBANDRY.** For students specializing in Poultry Husbandry advanced work will be given in the senior year. The work of this course consists of a study of Poultry literature, conducting experiments, and writing up results.

Prerequisites: Courses 1, 2.

Required of all seniors in Poultry Husbandry; senior year; first semester; four credits.

4. **ADVANCED POULTRY HUSBANDRY.** A continuation of course 3 together with assignments of special and original problems. Successfully to complete the advanced work will mean that the student has demonstrated his ability to lay out and manage a poultry farm; or to fill a college or station position in Poultry Husbandry. There is a growing demand for specialists along these lines.

Prerequisites: Courses 1, 2, 3.

Required of all seniors in Poultry Husbandry; senior year; second semester; nine credits.

6. **PRACTICAL POULTRY KEEPING.** A course arranged to meet the demands of students who desire a knowledge of practical poultry-keeping but who are unable to elect a full year's course. The course includes the selection of stock; breeding farm poultry; poultry house and equipment; methods of reproducing the flock; feeds and feeding; as well as markets and preparation of poultry products for market.

Elective; first or second semester; two credits; two lectures or recitations.

7. **MARKETS AND MARKETING.** Arranged for advanced study of poultry market conditions and the marketing of poultry and poultry products. Lectures or recitations consist of a study of available data and reports on original work. The laboratory course will supplement the work taken up in lecture and recitations. Students are required to do practical work such as preparing poultry products for market, fattening, killing, dressing and marketing fowls; and when possible will be in charge of actual marketing.

Elective; required of all juniors in Poultry Husbandry; first semester; two credits; one recitation or lecture; one laboratory period.

10. **FEEDS AND FEEDING.** A study of feeds and feeding related to the different branches of poultry-keeping. Lectures or recitations consist of a study of food stuff, their composition, etc., use in poultry feeding; also methods of feeding chickens of different ages and the feeding of chickens for different purposes. Laboratory work consists of a study of the various food mixtures and practice in mixing various rations.

Elective; required of all juniors in Poultry Husbandry; second semester; two credits; one lecture or recitation; one laboratory period.

11. **POULTRY DISEASES.** During the year 1913-14 this course will be given as Bacteriology 701.

Prerequisite: Bacteriology 101, 102, or equivalent.

Elective; required of all seniors in Poultry Husbandry; three credits; one lecture or recitation; two laboratory periods.

VETERINARY SCIENCE

Dr. Hollis

The object of the course in Veterinary Science is to enable the student to prevent disease, diagnose existing pathological conditions, arrest outbreaks of contagious and infectious diseases among domestic animals, give medical attention in emergency cases, and take care of the sick.

The course is given during the junior and senior years. Comparative Anatomy and Veterinary Physiology—the fundamental branches of medicine—are taught during the junior year; Comparative Medicine, Surgery, Obstetrics, Pathology and Materia Medica will be given in the senior year. The students of this department will be expected to be present at all the clinics—medical and surgical—and will have an opportunity to diagnose various diseases and assist in the surgical operations. Special attention will be given to lameness and obstetrics and the student will be called upon to perform obstetrical operations under the supervision of the veterinary surgeon in charge.

The following courses are offered:

B. ELEMENTARY VETERINARY SCIENCE. A study of the treatment and prevention of the common diseases of farm live stock. Special attention is given to sanitation and the prevention of diseases.

The Secondary course; second year; second semester; two credits; two recitations.

1. COMPARATIVE ANATOMY. Anatomy is taught in the most practical manner possible. Special attention is given to the digestive tract and also to the muscles of locomotion. The lectures are illustrated by fresh dissections, models, plates, blackboard drawings, etc. Anatomy, being the foundation of all medical knowledge, is fully explained in its relation to medicine and surgery. The course includes lectures, dissecting, recitations and quizzes.

Junior year; first semester; three credits; one recitation; two laboratory periods.

2. VETERINARY PHYSIOLOGY. This course embraces the study of chemical constituents of the body. The composition and functions of the blood, the functions of the liver, pancreas and the other glands that assist in digestion, absorption, nutrition, the production of animal heat, the locomotor apparatus, generation and development are fully discussed. The composition of the saliva, gastric juice, pancreatic juice, and other digestive secretions and their digestive actions are studied.

Junior year; second semester; three credits; two recitations; one laboratory period.

3. **MATERIA MEDICA AND COMPARATIVE MEDICINE.** The first half of the semester is devoted to the study of *Materia Medica*. The student is taught the terms employed in the science, the mode of action of the more common drugs in use and their method of administration. Each student will be required to make tinctures, liquors, blisters, liniments, plasters, compounds, etc. The United States Pharmacopoeia is used as a guide. The last half of the semester is devoted to the study of *Comparative Medicine*. This course includes clinics, lectures on diagnosis, hygiene and general sanitation, also the control of infectious diseases. In clinics the students are given an opportunity to use the drugs, etc., which were compounded in the course in *Materia Medica*.

Senior year; first semester; three credits; two recitations; one laboratory period.

4. **SURGERY.** In this course the apparatus used in surgery, and methods of restraint are studied, together with their practical application. The use of anesthetics and antiseptics is discussed, also the general principles in closing wounds, controlling hemorrhage, bandaging, massage, etc. Lectures on soundness, lameness, shoeing, dentistry and obstetrics will also be given.

Prerequisite: Course 1.

Senior year; second semester; three credits; one recitation; two laboratory periods.

5. **HISTOLOGY.** In this course the student is taught the normal microscopical structure of the fundamental tissues of the body, together with their location and development.

Prerequisite: Course 2.

Elective. Credits by arrangement.

6. **GENERAL PATHOLOGY.** This course in General Pathology treats of the history of pathology, predisposition, immunity, congenital and inherited disease; causes, course and termination of disease; circulatory disturbances—cardiac hyperaemia, hemorrhage, dropsy, oedema, thrombosis, embolism, and alternation of the blood; disturbances of metabolism—fever, necrosis, atrophy, cloudy swelling, fatty changes, calcification and concrement formation; the process of repair, new formations and functional disturbances.

Prerequisite: Course 5.

Elective: Credits by arrangement.

BACTERIOLOGY

Professor Beckwith

Mr. Vass

Mr. _____

M. Copson

The relationships of the comparatively new science of Bacteriology to everyday life in the various industries have increased so largely in numbers and intimacy that it is necessary for any student properly equipped in Dairying, Agriculture, Agronomy, Pharmacy, Domestic Science, etc., to have a working knowledge of the subject.

As in any well rounded subject, effort is in two directions which are closely associated, theory and practice. It is impossible for a student intelligently to carry out operations unless he understands the fundamental theories underlying.

The courses are so arranged in the Department of Bacteriology that a student may take thorough preparation in the subject in specific lines such as Pharmacy, Domestic Science, Agronomy, Sanitation, etc. This in turn, if desired, may be followed by special research problems and advanced work.

A. BACTERIOLOGY. This course deals with the most elementary questions of Bacteriology as applied to everyday life, such as the prevalence of bacteria and other micro-organisms and their activities, including the bacteriology of clean milk, pure water, filth disposal, curing of cheese, decay of manure, nodule formation on leguminous plants, vinegar production. Demonstrations and recitations.

The Secondary course in Agriculture; second year; second semester; two credits; two lectures and recitations.

101. ELEMENTARY BACTERIOLOGY. This course consists of a series of lectures and laboratory demonstrations to familiarize students with the underlying principles of bacteriology as applied to everyday life, and as an introduction to the more advanced courses in the subject.

The course in Agriculture; sophomore year; first semester; three credits; two lectures or recitations; one demonstration or laboratory period.

102. **ELEMENTARY LABORATORY BACTERIOLOGY.** This is a course given for the purpose of supplementing the lecture and demonstration work of bacteriology 101, to those who care to take it.

Prerequisite: Bact. 101.

Elective; junior year; second semester; two credits; two laboratory periods.

111. **GENERAL BACTERIOLOGY.** Beginning with the first semester of the junior year, a student may take bacteriology through the two semesters of that year, then continue advanced work through the two semesters of the senior year.

Elective; junior year; first semester; five credits; lectures and laboratory work.

112. **ADVANCED BACTERIOLOGY.** A continuation of course 111, the laboratory work familiarizing the student with special bacteriological apparatus and its use, then gradually proceeding into advanced work involving questions of pure science as well as the application of bacteriology to the professions and industries.

Elective; junior year; second semester; five credits; laboratory work and lectures.

116. **RESEARCH IN BACTERIOLOGY.** A thesis may be selected in this subject, beginning with the first semester, junior year, major bacteriology, and continuing through four semesters. The laboratory is especially equipped for work in agricultural bacteriology. However, ample facilities for research along veterinary, domestic science, or pharmaceutical bacteriology are at hand. Work for the master's degree either as a major or minor in the department may also be selected. The investigations are all outlined and conducted by the student in co-operation with the head of the department.

Elective; senior year. Credits to be arranged.

201. **PHARMACY BACTERIOLOGY.** This is the regular required course in Bacteriology for Pharmacy students, consisting of lectures and laboratory work tending to deal with the medical aspects of pharmacy.

The course in Pharmacy; senior year; first semester; four credits; two lectures or recitations; two laboratory periods.

202. PHARMACY BACTERIOLOGY. Continuation of Pharmacy Bacteriology 201, elementary clinical diagnosis, classification of bacteria, qualitative and quantitative determinations.

Prerequisite: Course 201.

The course in Pharmacy; senior year; second semester; three credits; one recitation; two laboratory periods.

203. CLINICAL BACTERIOLOGY. This course, intended primarily for students in pharmacy, deals with practice work in the ordinary methods of clinical diagnosis in use. Typhoid, diphtheria, tuberculosis, various pus formations, bacteriological examination of urine and feces, blood counting and differentiation into its elements, and dark ground illumination are some of the subjects treated.

Prerequisites: Courses 201, 202.

Elective; senior year; second semester; two credits; two laboratory periods.

204. CLINICAL BACTERIOLOGY. A continuation of the outline presented in course 203.

Prerequisites: Courses 201, 202, 203.

Elective; seniors; second semester; two credits; two laboratory periods.

205. IMMUNITY AND VACCINE THERAPY. This course includes a study of the standard methods in vogue in the various immunity and therapeutic reactions such as antitoxin formation, preparation of vaccines, the precipitin technique and standardization.

Prerequisites: Courses 201, 202 or equivalents.

Elective; senior or graduate year; credits to be arranged.

300. DOMESTIC SCIENCE BACTERIOLOGY. This course deals with bacteriology in its relations to home life; an introduction to the subject is made, therefore, along theoretical lines, with application to sanitation as concerns the house, covering such subjects as water supply, action of septic tanks, house sanitation, control and prevention of specific diseases, vinegar making, etc.

Course in Domestic Science and Art; sophomore year (1912-13); senior year; second semester; four credits; two lectures or recitations; two laboratory periods.

301. SANITARY BACTERIOLOGY. This course is primarily for Domestic Science and Art students in continuation of Bacteriology

300. This course deals with methods of sanitary bacterial examination in vogue for water, milk, butter, cheese, meat, air, etc. Certain simple clinical methods are also taught. Use and action of antiseptics and germicides and the methods of efficient fumigation are given proper attention.

Prerequisite: Course 300 or equivalent.

Elective for students in Domestic Science and Art or for others of equivalent preparation; junior or senior year; three credits; one lecture or recitation; two laboratory periods.

302. ZYMOLOGY. This course is intended as an elective for those of the course in Domestic Science and Art who desire a post graduate course dealing with technical yeast methods. The subjects include the microscopic structure of the yeast plant, the preparation and manipulation of special media designed for the growth of yeasts, pure culture methods used in zymology, methods of laboratory testing of commercial yeasts both for use in bread making and alcohol production, the bacteriology of salt-rising bread.

Prerequisites: Bacteriology 203, 204 or equivalents.

Elective; two credits; two laboratory periods.

401. DAIRY BACTERIOLOGY. This course is devoted exclusively to milk and dairy products. It considers the source of bacteria in dairy products, methods of control, usefulness of certain varieties, special media for milk, etc., examination, methods for milk examination.

Prerequisite: Course 101.

Senior year; first semester; three credits; two lectures or recitations; one laboratory period.

402. DAIRY BACTERIOLOGY. This course treats of the economic use of pure cultures of micro-organisms in buttermaking; methods of perpetuating pure cultures for starters; controlling flavor of cheese by use of pure cultures of selected organisms; enzyme activities; laboratory exercises in demonstrating pathogenic bacteria in milk, butter and cheese, leucocyte determinations.

Prerequisites: Courses 101, 401.

Elective; senior year; second semester; two credits; two laboratory periods.

403. DAIRY HALF YEAR COURSE. This is designed for those following the half year course in the Dairy Department and is intended to be an intensely practical treatment of dairy work from bacteriological considerations. The subjects of methods of milk contamination and methods of prevention, use and propagation of starters, milk inspection, the flavor and the curing of cheese of various kinds are among the more important subjects presented.

First semester; three credits; one lecture and demonstration; two laboratory periods.

501. AGRICULTURAL BACTERIOLOGY. A course consisting of lectures and laboratory work relating to micro-organic life in the soil in its various activities such as destruction of organic matter, humus formation, and the various nitrogen changes, but more especially with nitrogen fixation by legume bacteria. The technique of soil inoculation is also emphasized. Other phases of purely agricultural bacteriology are also considered.

Prerequisite: Course 101.

Elective; senior year; first semester; three credits; one recitation; two laboratory periods.

502. AGRICULTURAL BACTERIOLOGY. A continuation of the above and dealing with consideration of special soil changes such as ammonification, denitrification, non-symbiotic nitrogen fixation, sulphur combinations, the effects of various methods of tilth on bacterial soil activities.

Prerequisites: Courses 101, 501.

Elective; senior year; second semester; four credits; one recitation; three laboratory periods.

600. WATER AND SEWAGE BACTERIOLOGY. A course especially adapted to the needs of civil engineers and devoted to the bacteriology of water supplies, sewage and sewage disposal according to the standards and methods of the American Public Health Association.

Elective; seniors in Civil Engineering or of equivalent preparation; two credits; two lectures.

701. POULTRY DISEASE BACTERIOLOGY. This course is intended to deal with the bacterial consideration of the more common diseases of poultry and in it will be considered, chicken tuberculosis, chicken typhoid, white diarrhoea, roup, and avian diphtheria, soil contamination, and other methods of disease transportation.

Prerequisites: Bact. 101, 102 or equivalent.

Junior or senior year; first semester; three credits; one lecture or recitation; two laboratory periods.

BOTANY AND PLANT PATHOLOGY

Professor Jackson

Assistant Professor Barss

Mr. Lawrence

Mr. Bailey

Mr. Walls

Mr. Owens

The courses offered in the department of Botany and Plant Pathology aim not only to give the student a broad knowledge of plants, their structure, activities and relationships, but to show wherein the science of Botany is related to the problems of everyday life and the home, and to the practice of Agriculture, Pharmacy, Forestry, and Domestic Science and Art.

In the arrangement of work in the courses offered, the point of view of the several groups of students is kept constantly in mind and the work adapted to their needs. In order to make this possible in courses taken by students pursuing different lines of work, separate sections are provided.

The work of the department is carried on by means of recitations, lectures, and laboratory work. Texts and reference books are used mainly as an aid in correlating the facts brought out in the study of the plants in the laboratory. Living plants are used wherever possible. Drawing is made an important feature of the laboratory work, because the student, in order to draw accurately, must have observed clearly.

Particular attention is given to students desiring to take their major work in this department. Exceptional opportunities are offered to students who wish to prepare themselves for teaching Nature Study and Botany in the public schools and to those who wish to specialize in Botany and Plant Pathology preparatory for teaching or investigation work in Agricultural Colleges and Experiment Stations.

The following courses are offered:

A. **ESSENTIALS OF BOTANY.** This course provides an introduction to Plant Life and deals with the nature of plants; their structure; how plants grow and are propagated; how plants absorb and manufacture food; their relation to each other and to their environment; kinds of plants, etc.

Throughout the course the relations of Botanical Science to every day life, to household science, home gardening, etc., will be emphasized.

The Secondary course in Domestic Science and Art; second year; first semester; three credits; one recitation; two laboratory periods.

20. **PRINCIPLES OF BOTANY.** This course aims to present in a broad laboratory course the fundamental principles of Botany. The higher plants are first traced in their development from the seed to flower, special effort being made to correlate the study of morphology, histology, and physiology of the various parts. The morphology, evolution, and classification of plants will then be traced from lower to higher forms. Finally, the relation of plants to their environment and their use in nature and to man will be studied. Throughout the course the economic relations of botanical study will be emphasized. The work will be adapted in the several sections to meet the needs of the several groups of students.

The courses in Agriculture, Forestry, Pharmacy, and Domestic Science and Art; freshman year; first semester; three credits; one recitation; two laboratory periods.

21. **PRINCIPLES OF BOTANY.** A continuation of Botany 20. The courses in Agriculture, Forestry, Pharmacy, Domestic Science and Art; freshman year; second semester; three credits; one recitation; two laboratory periods.

NOTE.—Botany 20 and 21 or their equivalent are required as prerequisites for all the following courses except Botany 60.

30. FOREST BOTANY. This course is provided for the purpose of giving Forestry students a special training in the branches of Botany concerning which the Forester needs special knowledge. Particular attention will be given to microscopic structure of wood and to the morphology of Gymnosperms and Angiosperms. Practice will also be given in the identification of trees and other plants of interest to the Forester.

The course in Forestry; sophomore year; first semester; three credits; one lecture; two laboratory periods.

31. FOREST BOTANY. A continuation of course 30.

The course in Forestry; sophomore year; second semester; three credits; one lecture; two laboratory periods.

41. AGRICULTURAL BOTANY. This course presents to Agricultural students the fundamental botanical principles underlying Agricultural Practice and serves as an introduction to advanced work in Plant Physiology, Plant Breeding, Systematic Pomology and Olericulture, Agrostology, etc. The laboratory work will consist largely of a morphological and taxonomic study of agricultural plants.

The course in Agriculture; sophomore year; second semester; three credits; three laboratory periods.

45. TAXONOMIC STUDY OF FARM WEEDS AND GRASSES. This course aims to familiarize the students with the structure and classification of farm weeds and grasses. A detailed study will be made of well-selected types. The student will make a collection and identify as many specimens as time will permit.

Elective; junior or senior year; second semester; two credits; two laboratory periods.

50. PLANT PHYSIOLOGY. An advanced course in Experimental Plant Physiology. The student is taught by lectures and actual experiments the physiology of crop production. The discussion and experiments cover such topics as absorption, photosynthesis, digestion, respiration, translocation, growth, reproduction, irrigation, etc.

Designed to meet the needs of students in Agriculture; elective; junior or senior year; required of seniors in Pomology; first semester; three credits; one recitation; two laboratory periods.

51. PLANT PHYSIOLOGY. A continuation of course 50.

Elective; junior or senior year; required of seniors in Pomology; second semester; three credits; one recitation; two laboratory periods.

60. COMMERCIAL BOTANY. An elementary course arranged to meet the needs of students in Commerce. The commercial plants of the world will receive special attention.

Required of sophomores in Commerce; first semester; three credits; one recitation; two laboratory periods.

70. PHARMACEUTICAL BOTANY. This course is designed for Pharmacy students. Particular attention will be given to a study of Plant Histology. A study of the cell, cell contents, and types of tissues will be made, leading to more advanced work in the microscopic identification of drugs and of drug adulterations.

The course in Pharmacy; sophomore year; first semester; three credits; one recitation; two laboratory periods.

71. PHARMACEUTICAL BOTANY. A continuation of course 70. A special study of structural Botany and classification of drug producing plants will be made.

The course in Pharmacy; sophomore year; second semester; three credits; one recitation; two laboratory periods.

80. SEMINAR. Required of all major or graduate students in Botany and Plant Pathology. The work will consist of reports on advanced studies and abstracts of articles appearing in Experiment Station literature, scientific journals, or the agricultural press.

First semester; one credit will be allowed students who attend meetings regularly and who make satisfactory reports. Hours to be arranged.

81. SEMINAR. A continuation of course 80.

Second semester; one credit.

82. RESEARCH AND THESIS. Opportunity will be given students who desire to specialize in Botany and Plant Pathology to take up work not given in the regular courses, or to take up the investigation of special problems.

Senior year; first semester; one to five credits. At least three credits will be required in the senior year of all major students in Botany or Plant Pathology.

83. RESEARCH AND THESIS. A continuation of course 82.

Senior year; second semester; one to five credits. At least three credits will be required in the senior year of all major students in Botany or Plant Pathology. Credits to be arranged.

100. PRINCIPLES OF PLANT PATHOLOGY. The following are some of the topics to which attention is given in this course: the cause of disease in plants; the principles of plant disease control; fungicides and their use; dissemination and geographical distribution of plant diseases; their economic importance; disease resistance; methods of culture of parasitic fungi and bacteria, etc. In the laboratory, opportunity will be given for the study of plant disease producing organisms and their botanical relationship, methods of inoculation, etc.

Required in the course in Pomology; senior year; elective in other courses in Agriculture, junior or senior year; first semester; three credits; one lecture; two laboratory periods.

NOTE.—Preparatory for, and required as a prerequisite to, Botany 102, 104, 110, 112, 115.

102. DISEASES OF TREE AND SMALL FRUITS. A detailed study will be made of the cause and control of all the important fungous, bacterial, and physiological diseases. Particular attention will be given to the diseases of those tree and small fruit crops of importance in the Northwest. The laboratory work will include a careful study of the gross appearance and the effect on the host of various diseases as well as a microscopic study of the organisms causing the trouble and their relation to the tissues of the host.

Required in the course in Pomology; senior year; second semester; three credits; two lectures; one laboratory period.

104. DISEASES OF VEGETABLE CROPS. This course is similar in general to Botany 102, but deals with diseases of vegetable and field crops.

Elective; junior or senior year; second semester; three credits; two lectures; one laboratory period.

106. **FOREST PATHOLOGY.** Designed to meet the need of a special course in Phytopathology for Forestry students. A study of the fungi and bacteria causing diseases of forest crops will be taken up together with the principles of control. Decay of structural timber and the methods of avoiding this will also be studied.

Required of juniors in Forestry; first semester; four credits; two lectures; two laboratory periods.

110. **PHYTOPATHOLOGICAL TECHNIQUE.** A course in methods of investigations in Plant Pathology, which includes methods of keeping records; care of collections; culture work; inoculation; infection; and photography.

Required of students specializing in Plant Pathology; junior year; second semester; three credits; one lecture; two laboratory periods.

112. **PHYTOPATHOLOGICAL HISTOLOGY.** In this course a study will be made of histological modifications of plant tissues resulting from disease.

Required of all students specializing in Plant Pathology; senior year; second semester; three credits; one lecture; two laboratory periods.

115. **ADVANCED TAXONOMY OF PARASITIC FUNGI.** More advanced work on the Taxonomy and Phylogeny of plant disease producing organisms will be taken up in this course than is given in Botany 100. Practice in the identification of unknown forms will be given. A collection properly prepared for an herbarium will be required.

Required of students specializing in Plant Pathology; senior year; first semester; three credits; three laboratory periods.

NOTE.—Any of the courses outlined above except A, 20, 21, and 60, may be taken as a minor elective by junior or senior students in any course upon consultation with the head of the department; provided the course to be elected is not regularly required in the course of study in which the student is registered.

Opportunity will be given students to elect work in Economic Botany or Plant Pathology not offered in the above mentioned courses by registering in Botany 82, either as a major or minor subject. Students who elect Botany as a major study must have completed the work required in the freshman and sophomore years of the Agricultural courses or their equivalent.

ZOOLOGY, ENTOMOLOGY AND PHYSIOLOGY

Professor Cordley
Assistant Professor Wilson
Assistant Professor Safro
Mr. Sykes
Miss Edwards
Mr. Ewing
Mr. Lovett
Mr. _____

The instruction in this department is designed to give a general survey of the field of Zoology. It aims to develop an interest in the study of native birds, insects, and animals, their relations to the plant world, to each other and to man's welfare. By means of lectures, laboratory work, and field observations, the student becomes familiar with the structure and habits of a few representative forms, learns something of their relationships and of the relative economic importance of the various groups and of the biological laws which govern their development. The work is adapted so far as possible to the particular needs of students in Agriculture, Forestry, Pharmacy, and Domestic Science and Art. Exceptional opportunities are offered to those who desire to teach Zoology, Physiology, or Nature Study in the public schools. In connection with the course in Pharmacy, the required work forms a valuable pre-medical course.

The instruction in General and Economic Entomology is intended to provide the student with sufficient training to enable him to identify the common insect pests, understand their habits, and life-histories, and to apply the most approved methods for their control.

Advanced students in Entomology are provided with excellent opportunities for special instruction and research work.

The department occupies nine rooms on the third floor of Agricultural Hall and is well supplied with apparatus, reference books, bulletins, periodicals and collections.

The following courses are offered:

101. ZOOLOGY. A general study of vertebrate animals introductory to advanced courses in the department; also designed for those who, without intending to pursue the subject further, desire a general view of Zoological work and its problems. The work consists of laboratory study and lectures, supplemented by investigations in the field, beginning with the simplest animal forms; since it is believed that the student can thus best gain the desired conception of the origin and activities of the more complex animals. The aim is to give the student a general knowledge of the different animal forms, their distribution and habits, with special reference to their beneficial or injurious effects, to the end that he may get some insight into the more far-reaching significance of animal life.

The course in Forestry; sophomore year; the course in Pharmacy; freshman year; first semester; three credits; one lecture; two laboratory periods.

For requirements in the course in Agriculture see Zoology 108.

102. ZOOLOGY. A continuation of course 101, but dealing with such vertebrate types as amphioxus, lampreys, fishes, frogs, snakes, birds and mammals. Furthermore, this course aims to give an introduction to laboratory methods of dissection and experiment, to afford a general view of the structure and function of animals, and to present an outline of the more important biological theories, such as selection, adaptation, and heredity. Together with course 101, it is designed to give the student a general idea of the animal kingdom as a whole, and of the relative economic importance of the various groups.

The course in Forestry; sophomore year; the course in Pharmacy; freshman year; second semester; three credits; one lecture; two laboratory periods.

For requirements in the course in Agriculture see Zoology 109.

103. ZOOLOGY. A brief course designed to give the students in Domestic Science and Art some conception of the structure and physiological activities of animals, as a basis for the work in Physiology. The work consists of a general survey of the forms and activities of living organisms with general reference to the human organism.

The course in Domestic Science and Art, sophomore year; first semester; three credits; two lectures; one laboratory period.

104. EMBRYOLOGY AND HISTOLOGY. A consideration of the origin and development of the individual body; the elementary structures of the adult organs and tissues. The work consists of the study of such typical vertebrates as the chick and the pig with reference to other domestic animals and man. It involves practice in micro-technique, such as killing, fixing, imbedding, sectioning, and reconstruction from serial sections; and it is adapted to the requirements of general students as well as those intending to study Veterinary Science or medicine.

Prerequisites: Zoology 101, 102, or equivalent.

Elective in the courses in Agriculture and Pharmacy, junior or senior year; first semester; three credits; one lecture; two laboratory periods.

105. EMBRYOLOGY AND HISTOLOGY. A continuation of course 104.

Elective in the courses in Agriculture and Pharmacy; second semester; three credits; one lecture; two laboratory periods.

106. GAME PROPAGATION. A laboratory and reading course supplemented by field work in the propagation of food animals of the sea, streams and forests. Special attention will be given to the problems and methods of "sea-farming"; i.e., hatching and rearing of fish, crabs, crayfish, and lobsters; the planting and care of oyster-beds, etc.; the breeding and protection of game birds and mammals, together with a comparative study of the laws of various states regarding game.

Elective for students of Agriculture and Forestry; first semester; two credits; one lecture; one laboratory period.

107. ORNITHOLOGY. A lecture and field study of the common birds of Oregon; the course aims to develop an interest in the native birds, their habits and haunts, with particular reference to their usefulness.

Elective; second semester; two credits; one lecture; one laboratory period. Hours to be arranged.

108. PRINCIPLES OF ECONOMIC ZOOLOGY. A course which, like 101, aims to give the student a general knowledge of the different animal forms, their distribution and habits, but dealing more

extensively with facts and conditions which render animal life an important factor in the economic problems of life. The lectures and laboratory work will be supplemented by a considerable amount of collateral reading.

Required of Agricultural sophomores; five credits; two lectures; three laboratory periods.

109. PRINCIPLES OF ECONOMIC ZOOLOGY. Like 102, this course aims to give an introduction to the methods that obtain in laboratory investigations, to afford a general view of the structure and functions of the animal body and to present an outline of the different biological theories; but it particularly aims to show how the general laws and principles of animal life may be applied to present economic conditions.

Required of Agricultural sophomores; four credits; one lecture; three laboratory periods.

110. ANIMAL PARASITES. An advanced course for the study of such parasitic forms as flukes, tapeworms, nematodes, fish "lice", cattle ticks, etc., that affect the health of man, domestic and food animals; the study will be primarily ecological; the object being to obtain a more exact knowledge of the conditions which produce parasitism, to the end that by intelligent control, diseases and economic losses may be rendered less liable, and preventive measures productive of more permanent results.

Elective to students in Agriculture, Forestry, Pharmacy, junior or senior year; first semester two credits; two laboratory periods.

111. PROTOZOOLOGY. An advanced course for the study of microscopic animals with a view of their relation, beneficially or injuriously, to man; particular attention being paid to such pathogenic forms as blood spores and enteric parasites with some reference to soil protozoans.

Elective for students in Agriculture and Pharmacy; junior or senior year; second semester; two credits; two laboratory periods.

112. RESEARCH AND THESIS. Opportunity will be given students who desire to specialize in Zoology and Physiology to take up work not given in the regular courses, or to take up the investigation of special economic problems.

Senior year; first semester; one to five credits.

113. RESEARCH AND THESIS. A continuation of 112.

Senior year; second semester; one to five credits.

201. PHYSIOLOGY AND ANATOMY. This course is intended not only for the general student but also for those students particularly interested in this branch of Zoology and for those who expect to study medicine. It includes a study of the structure, significance, and function of the human body with reference to the animal body in general. As a foundation for the study of function, the laboratory course includes some work upon the gross anatomy and the histology of the various tissues and organs of a typical mammal. It also includes experiments and demonstrations with foods, the study of blood, nerve-muscle, reactions, etc.

Prerequisites: Zoology 101, 102.

The course in Pharmacy; sophomore year; first semester; three credits; one lecture; two laboratory periods. Elective for other students.

202. PHYSIOLOGY AND ANATOMY. A continuation of course 201, especially valuable to those who expect to teach Physiology in the public schools. In connection with the work in Pharmacy it forms a valuable pre-medical course. Required course for Pharmacy sophomores; elective for other students.

Prerequisites: Zoology 101, 102, 201.

The course in Pharmacy; sophomore year; second semester; three credits; one lecture; two laboratory periods.

203. PHYSIOLOGY. A study of the chief functions of the human body, and of the laws of human health falling naturally within its province. The laboratory work will include experimental work in digestion, and the consideration of blood and muscles. In addition, such study of anatomy, and the histology of tissues, will be made as is essential as a foundation for the understanding of function.

Prerequisites: Zoology 103.

The course in Domestic Science; junior year; first semester; four credits; two lectures; two laboratory periods.

204. PHYSIOLOGY AND HYGIENE. A general course in Physiology designed primarily to give the Commerce students a practical knowledge of the functions and care of the human body in everyday

life. The laboratory work will include experimental work and demonstrations, also a study of the gross anatomy and histology of the various tissues and organs of mammals.

The course in Commerce; sophomore year; second semester; three credits; two lectures; one laboratory period.

205. ADVANCED PHYSIOLOGY. A course designed for students desiring additional knowledge of the subject. Particular attention will be given to the processes of digestion, absorption, nutrition and excretion.

Prerequisites: Zoology 202, and General Chemistry.

Elective in the course in Domestic Science; junior or senior year; first semester; three credits; one recitation; two laboratory periods.

301. INTRODUCTORY ENTOMOLOGY. An introduction to the study of insects by lectures, laboratory and field exercises. The laboratory work consists of a preliminary study of the anatomy of the grasshopper with comparative work upon other types. Sufficient field work in collecting, and laboratory work in properly mounting and classifying insects, is provided to make the student familiar with the principal orders of insects. In this and succeeding courses in Entomology, the rearing of economic and other forms is carried on parallel with other work to gain familiarity with the development and habits of insects. Each student is required to familiarize himself with the life-history, habits, and means of controlling some insect of economic importance.

Prerequisites: Zoology 101, 102, and a collection of insects consisting of at least 250 specimens.

Required in the courses in Horticulture, Forestry, Plant Pathology and Entomology. Elective in other courses; junior year; first semester; three credits; one lecture; two laboratory periods.

302. ENTOMOLOGY OF ORCHARD AND SMALL FRUITS. An intensive study of the more important insect enemies of the apple, pear, prune, cherry, plum, currant, gooseberry, bramble fruits and strawberry, and the critical examination of the methods to be employed in combating them. Each important pest will be studied in the field and laboratory, with a view to becoming thoroughly

familiar with the appearance of the insect and its work in all its stages of development.

Prerequisite: Zoology 301.

Required in the courses in Pomology, Plant Pathology and Entomology. Elective in other courses; junior year; second semester; three credits; one lecture; two laboratory periods.

303. ENTOMOLOGY OF TRUCK CROPS. A course similar to 302 with special emphasis put on the intensive study of the insect enemies of celery, onion, beet, cabbage, kale, clover, vetch, potato, hop, corn, wheat and oats.

Prerequisite: Zoology 301.

Required in the course in Vegetable Gardening; junior or senior year; second semester; three credits; one lecture; two laboratory periods. Will be given to a class of not less than five students.

304. FOREST ENTOMOLOGY. A study of the insects destructive to forest trees and forest products, the insect enemies of reforestation and the measures by which the injuries may be avoided or reduced.

Prerequisite: Zoology 301.

The course in Forestry; junior year; second semester; three credits; one lecture; two laboratory periods. Will be given only to a class of not less than five students.

305. ADVANCED ENTOMOLOGY. This course is designed for those who desire to specialize in Entomology. The instruction includes lectures and reference reading upon the biology of the principal families of insects, supplemented by laboratory studies of typical life-histories. Considerable time is devoted to studying the habits of insects, particularly injurious species in the field; to collecting, rearing, mounting, and classifying them; and to becoming familiar with Entomological methods and literature.

Required in the course in Entomology, elective in the courses in Agriculture; junior year; second semester; five credits; two lectures; three laboratory periods.

306. ADVANCED ENTOMOLOGY. A continuation of course 305. Required in the course in Entomology; elective in the courses in Agriculture; senior year; first semester; five credits; two lectures; three laboratory periods.

307. **ADVANCED ENTOMOLOGY.** A continuation of courses 305 and 306.

Required in the course in Entomology, elective in the courses in Agriculture; senior year; second semester; five credits; two lectures; three laboratory periods.

In connection with courses 305, 306 and 307, the student will be required to present a thesis detailing the results of a systematic study of some restricted group of insects or of the biology of some particular species or group of species.

309. **BEEKEEPING.** A course in the theory and practice of keeping bees for profit and in relation to fertilization of orchard trees.

The College has an apiary in which students will be able to become fully acquainted with modern apicultural methods.

Elective in the courses in Agriculture and Domestic Science and Art. Second semester; one credit; one laboratory period.

310. **SEMINAR.** Senior and graduate students in Entomology. Reading, discussing, and abstracting the leading articles on Entomology as they appear in the scientific journals, horticultural press, current magazines, and experiment station literature.

Senior year; first semester; one credit.

311. **SEMINAR.** A continuation of course 310.

Senior year; second semester; one credit.

*312. **PROBLEMS IN FOREST ENTOMOLOGY.** This course will include the study and application of methods of forest insect investigations. Each student will be assigned a practical problem in Forest Entomology to work out under direction.

Prerequisite: Zoology 315.

Credits to be arranged.

*313. **PROBLEMS IN FOREST ENTOMOLOGY.** A continuation of course 312.

Prerequisite: Zoology 304.

Credits to be arranged.

315. **ENTOMOLOGY OF FIELD CROPS.** Similar to 303, but devoted to a discussion of the insect enemies of field crops and their control.

*By special arrangement, credits may be allowed for satisfactory work done during the summer vacation.

Required in the course in Agronomy. Elective in other courses; junior year; second semester; two credits; two lectures or recitations.

Any of the above courses may be elected as a major upon consultation with the instructor. Students electing major work for a degree in this department will be required to take courses 101, 102, and to carry an equivalent of five credits throughout the junior and senior years. Graduate courses leading to a master's degree may be arranged for upon consultation with the head of the department and the Committee on Advanced Degrees.

FORESTRY

Professor Peavy
Mr. Newins

The purpose of the College in giving instruction in Forestry is to train young men to practice that profession, adapting the work as far as practicable to fit the peculiar forestry conditions existing in Oregon and in the Northwest generally. It is realized fully that European forestry methods are not applicable at the present stage of economic development in this region, and that they will not be for many years to come. Scientific forestry practices in vogue abroad are studied only as they apply to the fundamental principles of forestry and for the purpose of adding to the general professional knowledge of the student.

The College is located in the heart of a timbered region, offering exceptional opportunities for the study of forestry conditions in the woods, in the camps, and in the mills. Mature and second growth stands are easily accessible. Logging operations can readily be reached from Corvallis, while mills in the city afford an opportunity for studying milling methods. Practical work in timber cruising, map making, and planning logging operations may be done by the student with little extra expense. Wood distillation plants, creosote works and factories for the production of finished wood products can easily be reached in a few hours' travel. The watershed which

supplies the city of Corvallis is at the disposal of the Forestry Department for the demonstration of scientific forestry methods.

The following courses are offered:

A. **ELEMENTARY FORESTRY.** Covering in an elementary way the fundamental principles of forestry; the forest as a resource; the influence of a forest cover on soil and climate and stream flow; the aesthetic value of the forest; an elementary discussion of the development of forestry in Europe; the forestry movement in the United States.

The Secondary course; first year; first semester; four credits; three recitations; one laboratory period.

B. **ELEMENTARY FORESTRY.** A continuation of course A.

The Secondary course; second year; second semester; four credits; four recitations.

C. **ELEMENTARY SILVICULTURE.** The conditions favoring forest growth; the reproduction of the forests naturally and artificially; the collection of forest tree seeds; seed sowing; seed storage; general nursery practice; field planting. The natural extension of the forest.

The Secondary course; second year; first semester; two credits; one recitation; one laboratory period.

D. **ELEMENTARY SILVICULTURE.** A continuation of course C.

The Secondary course; second year; second semester; two credits; two recitations.

101. **GENERAL FORESTRY.** A study of economic causes leading to the development of scientific forestry in Europe. Conditions in the United States pointing to the necessity for the application of improved methods; the natural forest; the forest improved by man; the forest regions of the United States; the national, state and private forests; the economic importance of forestry with special reference to American conditions. Special discussion of forest conditions in Oregon; farm forestry.

Freshman year; first semester; three credits; three recitations.

102. **GENERAL FORESTRY.** A continuation of course 1.

Freshman year; second semester; three credits; three recitations.

201. **SILVICULTURE.** The life-history of trees, their influences, modification and growth, and development; the soil, climate and

other factors of site; the development, modification and improvement of types; theoretical silvicultural systems of management, the application of the clear cutting, selection, shelter wood, coppice group and strip systems to American conditions; methods of thinning, for the improvement of growth. Protection of forests as related to Silviculture, laying emphasis upon methods of fire protection in the Northwest. Silvical studies.

Sophomore year; first semester; two credits; two recitations; one laboratory period.

202. SILVICULTURE. Artificial and natural regeneration; tree seeds, their structure, form, distribution; seed collection; seed testing; storage; generation periods; nursery practice; forest planting, planting plans, costs of planting.

Sophomore year; second semester; three credits; two recitations; one laboratory period.

203. ADVANCED SILVICULTURE. In this course the forest regions of the United State are subdivided into silvicultural divisions. In each subdivided unit a study is made of forest physiography, prevailing forest types, silvicultural management, problems of protection, market relations and a review of the silvical habits of trees important from standpoint of management. The study of the divisions in the West embraces all the national forests of the six federal districts and their location.

Junior year; first semester; two credits; two laboratory periods.

204. ADVANCED SILVICULTURE. Silvical literature. Each student will be required to make a detailed silvical study of some definite forest tract, and present a thesis covering the work. Investigation of special silvical problems. The working out of problems of management under special conditions.

Junior year; second semester; two credits; one recitation; one laboratory period.

301. FOREST MENSURATION. The determination of the contents of logs in cubic feet and in board measure; the study of log rules; methods of scaling timber; methods of computing the contents of entire felled trees; height measurements; volume tables; form factors; estimating the contents of entire stands; the growth rate of individual trees and of the forest; yield tables. Each

student will be required to estimate, map and describe a given stand of timber.

Junior year; first semester; three credits; two recitations; one laboratory period.

302. FOREST MENSURATION. A continuation of course 301.

Junior year; second semester; three credits; two recitations; one laboratory period.

303. FOREST SURVEYING AND MAPPING. Rough topographic and plane surveying of timbered areas; use of plane table and army sketching board; mapping field data; drill in lettering and in use of conventional signs.

Junior year; second semester; three credits; one recitation; two laboratory periods.

401. MANAGEMENT. The business of administering the forest; the policy of Federal, State, and private owners; a review of forest mensuration, including methods of determining the volume of single trees and of stands; the costs of forest products; the present value of the future crop; the value of young growth; the preparation of a working plan for a given area of timbered land, including a valuation survey, map, and forest description; the protection of the forest from fire, insect attacks and other injuries; the organization of the forest force for effective work.

Senior year; first semester; five credits; three recitations; two laboratory periods.

402. MANAGEMENT. A continuation of course 401.

Senior year; second semester; five credits; three recitations; two laboratory periods.

403. UTILIZATION. The use of the secondary wood products; the chemical products of wood; wood distillation; the utilization of waste; the tanbark industry; the manufacture of cooperage stock, shingle, lath, matches, veneer; shipping crates, charcoal, etc.

Senior year; first semester; two credits; one recitation; one laboratory period.

404. LUMBERING. The history of the lumber industry, including a study of the methods used in different regions; special attention to lumbering operations in the Northwest; the transportation of logs from the woods to the mill; the use of steam machinery

in skidding and hauling; driving; the methods of milling; seasoning and grading; the cost of logging and milling with reference to some definite operation. During the course each student will be required to prepare a thesis from data collected by personal study of some extensive logging and milling business.

Senior year; second semester; five credits; two recitations; three laboratory periods.

405. NATIONAL FOREST ADMINISTRATION. A study of the methods of administering the Federal forests; the organization of the administrative force on the forest; fire patrol; timber sales; grazing; the forest homestead law; special uses of forest resources; permanent improvement.

Senior year; second semester; three credits; three recitations.

406. FIELD WORK. Between the junior and senior years each student will be required to devote eight weeks to actual work in the field. This period will be given to the practical work required of foresters, as estimating, mapping, and preparing forest descriptions; rough topographic and plane surveying; examination of logging problems; study of site conditions in relation to forest types; camping and packing.

An equivalent amount of field work may be offered as a substitute for this course. Four credits.

501. DENDROLOGY. Classification and identification of forest trees; silvical characteristics of commercial species; forest regions of the United States; relative importance of timber species; life history and requirements of trees.

Senior year; first semester; five credits; three recitations; two laboratory periods.

502. WOOD TECHNOLOGY. Microscopic structure of wood; defects due to knots, decay, and checks; structural changes due to seasoning; identification and classification of commercial woods; experimental study of the strength of timbers; the relation between moisture content and strength; chemical properties of wood.

Senior year; second semester; three credits; one recitation; two laboratory periods.

503. WOOD PRESERVATION. Primary causes of decay; the relation of moisture content to durability; surface application of preservatives; the preservation of wood through impregnation with preserv-

atives; the open tank method of treating timbers; economic effect

Senior year; first semester; two credits; one recitation; on laboratory period.

504. DENDROLOGY. A study of the characteristics of the commercial timber trees of the Pacific Northwest. Designed to enable the student to identify tree species in the woods.

Sophomore year; first semester; two credits; one recitation and one laboratory period.

505. FOREST PROTECTION. This course makes a study of the methods of dealing with forest fires under the peculiar conditions existing in the Northwest. State and Federal fire laws. Roads trails, telephone lines, fire lines. Organization of a patrol system. Costs. Insect control.

Sophomore year; second semester; two credits; two recitations.

601. LOGGING RAILROADS. A study of the special problems connected with the construction of logging railroads. Grades, curves, cuts, fills, switch-backs. Lectures and discussion, followed by field study on some extensive logging operation.

Junior year; first semester; three credits.

602. HYDRAULICS. A course dealing with the uses of water in transporting logs. Units of measurement. Splash dams, flumes.

Junior year; first semester; two credits.

603. BRIDGE CONSTRUCTION. This course deals with the construction of the peculiar types of bridges used in logging operations. Factor of safety. Costs. Preliminary laboratory exercises, followed by studies on logging operations.

Senior year; second semester; three credits.

604. LOGGING ENGINES. A study of the construction and operation of engines used in logging operations. Laboratory and field work.

Senior year; first semester; four credits; two recitations and two laboratory periods.

605. LOGGING MANAGEMENT. This course deals with the business problems connected with logging. Organization of the working crews. Cost of operations. Cost keeping systems. Improved methods. Experts in logging will deal with special phases of the subject.

Senior year; second semester; three credits; three recitations.

606. LOGGING DEVICES AND EQUIPMENT. This course will include the following: Bridge, flume and chute construction. Methods of slinging rigging. Types of cars. Skidding and loading devices. Electrical machines used in logging. Detailed investigation of costs and makes of equipment. Special reports accompanied by photographs, maps and drawings, will be required. At least three weeks of each semester must be devoted to study of some up-to-date logging operation.

Senior year; first semester; five credits; two recitations; three laboratory periods.

607. LOGGING DEVICES AND EQUIPMENT. A continuation of course 606.

Senior year; second semester; five credits; two recitations; three laboratory periods.

608. SPECIAL SUBJECTS. This course will include camp sanitation, use of explosives, discussion of current logging literature, laws relating to lumbering operations. During the semester lectures will be given by practical loggers.

Senior year; second semester; three credits; three recitations.

SCHOOL OF DOMESTIC SCIENCE AND ART

DOMESTIC SCIENCE

Professor Calvin

Assistant Professor Milam

Mrs. Dolman

Miss Smith

Miss Lewis

Miss McCall

Miss _____

The following courses are offered:

A. SIMPLE FOOD PREPARATION. This course is planned to approximate the first year's work in Domestic Science offered in secondary schools. The aim of the course is to give the students as thorough a knowledge of the composition, nutritive value, and preparation of food materials as is possible without a study of the fundamental sciences. Laboratory work will consist of practice in the best methods of cooking vegetables, meats, and other food which will familiarize students with the principles of cookery.

First year; first semester; three credits; one recitation; two laboratory periods.

B. SIMPLE FOOD PREPARATION. A continuation of course A.

First year; second semester; three credits; one recitation; two laboratory periods.

C. FOOD PREPARATION. In addition to further practice in cookery, with the preparation of foods requiring more skill than in course A, such as bread, cakes and pastry, the matter of good food combinations in menus is emphasized, together with a study of table arrangement and serving. Students are enabled by practice to understand the principles of food economy, including the buying of meat at the market, home canning of fruits and vegetables, and care of food supplies in the home.

Second year; first semester; three credits; one recitation; two laboratory periods.

D. FOOD PREPARATION. A continuation of course C. A number of special subjects are considered during this semester, such as a brief study of invalid diet, and the planning and serving of refreshments for certain occasions, as picnics and afternoon teas.

Second year; second semester; three credits; one recitation; two laboratory periods.

E. LAUNDERING. This course deals with the principles of laundering through practical application, together with a study of cleansing materials; choice of starch, bluing and soap, and the treatment of hard water. The cleansing process for all types of materials, methods of removing stains, folding and care of clothing are considered.

Second year; second semester; one credit; one laboratory period.

101. FOOD PREPARATION. This course introduces the subject of foods in their scientific and economic aspect. The laboratory work consists of preparation of food, with a study of the changes brought about by the applications of heat, experiments being made to illustrate the principles involved. The classes prepare all of the common foods in many ways, serve simple meals and study suitable food combinations.

Sophomore year; first semester; three credits; one recitation; two laboratory periods.

102. FOOD PREPARATION. A continuation of course 101.

Sophomore year; second semester; three credits; one recitation; two laboratory periods.

103. FOOD PREPARATION. A survey course of 101 and 102 for graduates of secondary schools with training in Domestic Science.

Sophomore year; first semester; three credits; one recitation; two laboratory periods.

104. FOOD PREPARATION. This course elaborates the principles taught in Food Preparation 101 and 102, and introduces more advanced work. An application of the knowledge of Science is made by canning, preserving fruits, and making jellies. Bread, cake, other flour mixtures, and the preparation of vegetables and meats are also studied until the student has mastered the subject.

The lectures are devoted to questions of nutrition and the economical purchase and use of food.

Junior year; first semester; three credits; one recitation; two laboratory periods.

105. FOOD PREPARATION. A continuation of course 104. The preparation and service of meals is the chief laboratory work of the second semester.

Junior year; second semester; three credits; one recitation; two laboratory periods.

180. FOOD PREPARATION. For women desiring knowledge of home cookery. A study of typical foods and their preparation in attractive forms, with the planning and serving of meals.

One evening lesson per week. A term of twelve lessons.

Either semester; hours to be arranged.

190. CAMP COOKERY. This course is planned to teach various ways of combining into palatable and nutritious products such food materials as are available for use in camps. The making of different kinds of breads, as well as mulligans, griddle-cakes, and other camp dishes, is emphasized, practice being given during the latter part of the course in preparing food out of doors by means of Dutch ovens, reflectors, and improvised cooking utensils.

Elective; junior or senior year; first and second semester; one credit; one laboratory period.

201. DIETETICS. This course includes a scientific study of food materials in their relation to the daily dietary of families under various conditions of health and environment, a study of the dietary standards and the metabolism of carbohydrates, fats and proteins. A comparison of the nutritive values of the common foods is made by computing, preparing, and serving dietaries of specific costs, furnishing specific nutrients.

Senior year; first semester; five credits; two recitations; three laboratory periods.

202. DIETETICS. A continuation of course 201. During the second semester special stress is placed on invalid diets, and diseases as affected by food.

Senior year; second semester; five credits; two recitations; three laboratory periods.

301. HOUSE SANITATION. This course deals with the house as a factor in health. It includes a study of the following topics: Situation, surroundings, ventilation, heating, drainage, plumbing, lighting, and furnishing. Investigation will be made of general sanitary conditions from a practical and scientific standpoint with special reference to the needs of the community, the household, and the school.

Junior year; first semester for D. A. students, and second semester for D. S. students. Two credits; two recitations.

401. LAUNDERING. This course presupposes a knowledge of general inorganic chemistry, and is a careful study of the underlying principles of the process of laundering, including the chemistry of cleaning. Experimental work showing the composition of various kinds of soaps, bluing, and starches and their effects on fabrics, enables students to select the best and most economical cleansing agents. Practical application is made in a series of lessons devoted to the removal of stains, to washing, ironing, and folding clothing, and to the care and equipment of the home laundry.

Freshman year; second semester; one credit; one laboratory period.

501. HOUSEHOLD ADMINISTRATION. This course will consider the order and administration of the house, with a view to the proper division of the income and the maintenance of suitable standards. It will include a study of the domestic service problem.

Senior year; second semester; two credits; two recitations.

511. HOME NURSING. This course consists of the study of the scientific care of the patient under home conditions, including the furnishings, temperature, and ventilation of the room, bathing, dressing, and administering food and medicine to the patient; and also a study of the other duties of the home nurse in aiding the physician intelligently to add to the comfort of the sick. This means the ability to recognize and correctly report symptoms, to relieve pain, to disinfect, and to treat wounds, burns, and sprains, as well as to meet successfully emergencies that may arise in the home.

Freshman year; second semester; two credits; two recitations.

540. EVOLUTION OF THE HOUSE. (a) The development of the modern house from primitive conditions.

(b) The evolution of the house from the artistic point of view. Elective; junior year; first semester; two credits; two recitations.

550. MODERN PROBLEMS IN HOUSEHOLD ADMINISTRATION. The topics assigned for research will be chemical, physiological, bacteriological, economical, or sociological according to the preference and training of the individual students.

Graduate year; first semester; credits to be arranged.

551. MODERN PROBLEMS IN HOUSEHOLD ADMINISTRATION. A continuation of the research work commenced in course 550.

Graduate year; second semester; credits to be arranged.

701. SPECIAL RESEARCH IN COOKERY. In assigning research problems for graduate students both the previous training and the students' preferences are considered. Assignment of problems to be worked upon during the year is made by the professor in charge.

Graduate year; first semester; credits to be arranged.

702. SPECIAL RESEARCH IN COOKERY. Continuation of research work commenced in course 701.

Graduate year; second semester; credits to be arranged.

DOMESTIC ART

Professor Brooks

Miss Hitchcock

Miss Robinson

Miss Raber

Miss Moore

Miss _____

The following courses are offered:

A. SEWING. This course consists of hand sewing to give the student a knowledge of the principles of construction and execution; training in neatness, accuracy, and economy of materials. Discussion as to suitability of materials to use with regard to household linens and furnishings.

The textile work is a study of the development of the textile industries, spinning and weaving.

First year; first semester; three credits; one recitation and two laboratory periods.

B. SEWING. A continuation of Course A. The problems considered are the making of underwear; mending and darning of clothing, and care of clothing. The study of cotton as basis for the appreciation of materials being used.

First year; second semester; three credits; one recitation and two laboratory periods.

C. SEWING. This course will give the student practice in machine work applied to the making of cookery costume and kimono; hand work applied in embroidering dresser cover and crocheting bed slippers. Textile work will be the study of wool and silk.

Second year; first semester; three credits; one recitation; two laboratory periods.

D. SEWING. Continuation of Course C, with practice in care of clothing, removal of spots, making of night gowns and wash dresses. Textile work will be the study of linen.

Second year; second semester; three credits; one recitation; two laboratory periods.

101. SEWING. The course consists of the fundamental principles of hand and machine sewing applied to household linens and undergarments. Darning, patching, and care of clothing will be considered.

The study of the development of the textile industries will give a deep appreciation for fabrics, and the responsibility for thoughtful purchasing.

Freshman year; first semester; three credits; one recitation; two laboratory periods.

102. GARMENT MAKING. Continuation of Course 101 in which drafting and making of undergarments will be presented. Simple embroidery stitches will be taught where such is applicable. The study of cotton will give an added value to the garments being made.

Prerequisite: Domestic Art 101.

Freshman year; second semester; three credits; one recitation; two laboratory periods.

103. GARMENT MAKING. This course is designed for graduates of approved high schools with Domestic Art training.

Freshman year; second semester; three credits; one recitation two laboratory periods.

201. DRESSMAKING. The fundamental principles of dress making, the drafting, making, and adjusting patterns to measurements, the making of shirt waists, tailored skirts, and a simple cotton dress will be considered.

The textile work will be a study of linen.

Prerequisites: Domestic Art 101, 102.

Junior year; first semester; three credits; three laboratory periods.

202. DRESSMAKING. Continuation of Course 201.

The textile work will be a study of silk and wool.

Prerequisites: Domestic Art 201.

Junior year; second semester; three credits; three laboratory periods.

203. TAILORING. This course has for its problem the making of a cloth jacket suit. Careful drafting of the patterns and excellence of construction and finish will be required.

Prerequisites: Domestic Art 202.

Senior year; first semester; three credits; one recitation; two laboratory periods.

204. ADVANCED DRESSMAKING. Drafting and making of elaborate gowns. Emphasis will be put on color combinations technique, suitability of design for material used and for purpose intended.

Prerequisites: Domestic Art 202.

Senior year; second semester; three credits; one recitation; two laboratory periods.

301. MILLINERY. This course includes designing and constructing buckram and wire frames. Making and placing of trimmings, renovation of materials, straw sewing, bow making, and the construction of a hat from foundation to completion.

Senior year; second semester; two credits; two laboratory periods.

401. BASKETRY. A form of decorative art which involves careful consideration of form, color and design; these principles will be considered in the making of rugs, reed baskets, stools, etc.

Elective; junior year; first semester; two credits; two laboratory periods.

402. BASKETRY. Continuation of Course 401 in which the raffia stitches will be considered. The work required will be the completion of baskets in which the emphasis will be put on technique, form, and color combinations.

Elective; junior year; second semester; two credits; two laboratory periods.

404. HANDWORK AND WEAVING. This course involves the construction of articles in simple weaving, and making and applying stencil patterns; using principal embroidery stitches on runners, pillows, gowns, etc.

Elective; senior year; first semester; two credits; two laboratory periods.

405. HANDWORK AND WEAVING. Continuation of Course 404, with practice in Florentine, French ribbon work, fine embroidery, and weaving on large loom.

Elective; senior year; second semester; two credits; two laboratory periods.

501. HOUSE CONSTRUCTION. A study of the location and surroundings of the house, house plans, details and comparative values of various building materials, types of house architecture, architect's specifications, heating, lighting, and ventilation, private and public disposal of waste supplies, and practical work in the making of house plans.

Elective; junior year; first semester; two credits; two laboratory periods.

502. HOUSEHOLD DECORATION. This is a practical course in decoration and furnishing of the entire home. The problems of artistic and economic furnishings will be considered.

Elective; junior year; second semester; two credits; two laboratory periods.

601. TEXTILES. This course takes up the study of fabrics, the study of the evolution of spinning and weaving; the manufacture of fabrics, and the manufacturing conditions that affect the value of materials; tests for adulterations; estimates for the clothing of

children and adults according to various conditions; visits to stores to consider values.

Senior year; first semester; two credits; one recitation; one laboratory period.

701. COSTUME DESIGN. This course in designing and sketching of costume aims to give emphasis to the artistic side of dressmaking and millinery and provides design for reproduction in materials in Domestic Art, 204 and 301. A study in the principles of design theory of color, and art in relation to modern dress, is included.

Elective; senior year; first semester; two credits; one recitation one laboratory period.

SCHOOL OF ENGINEERING AND MECHANIC ARTS

CIVIL ENGINEERING

Professor Skelton

Assistant Professor —————

Mr. Dolan

Mr. Edgecomb

The following courses are offered:

101. MECHANICAL DRAWING. The use of instruments and the elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, and finally the complete development of a working blue-print of some simple device from sketches. Particular attention is given to free-hand lettering, general neatness, and accuracy.

Civil Engineering; freshman year; first semester; three credits; three laboratory periods.

103. ENGINEERING DRAWING. A continuation and extension of the previous work in drawing with special reference to application in Civil Engineering. Practice in tracing and in blue and black process printing will be given.

Prerequisites: C. E. 101; Art 1.

Sophomore year; first semester; two credits; two laboratory periods.

104. ENGINEERING DRAWING. This course is a continuation of course 103.

Prerequisite: C. E. 103.

Sophomore year; second semester; two credits; two laboratory periods.

201. PLANE SURVEYING. This course includes recitations, lectures, field and office work in the theory and practice of plane

surveying. The theory and construction of the different surveying instruments are studied and practice will be given in making their tests and adjustments. The United States public land surveys and land laws are studied. Forms of field notes, methods of balancing and plotting surveys, computing areas and like work, will have due consideration. Proper emphasis will be placed upon chain surveying. Surveys will be made of assigned plats, and descriptions prepared. Resurveys will be made where more than ordinary difficulty is encountered in the interpretation of descriptions and existing evidence.

Prerequisites: Math. 11 and C. E. 101.

The courses in Civil Engineering, Mining Engineering, and Forestry; freshman year; second semester; five credits; two recitations; three laboratory periods.

203. PLANE SURVEYING. This course is a condensation of course 201, and is designed for students in the courses in Agriculture and Mechanical or Electrical Engineering. The greater part of the time is spent by the student in the field with the various instruments. Exercises relating to farm surveying, drainage, irrigation and road construction, occupy most of the time. Areas are computed, profiles are constructed, and estimates formed.

Prerequisite: Math. 11.

Elective; second semester; three credits; three laboratory periods, in the field or office with assigned lectures.

204. TOPOGRAPHIC SURVEYING. This course will include the execution of a complete topographic survey of an assigned tract including base line measurement, transit, stadia, and plane table work, platting and finishing the map.

Prerequisites: C. E. 201; C. E. 101; Art 1.

The course in Civil Engineering; sophomore year; first semester; five credits; five laboratory periods.

205. TOPOGRAPHIC SURVEYING. A condensation of course 204 and in addition requires a rough topographic survey of a forested section.

Prerequisite: C. E. 201.

Sophomore year; first semester; Forestry course; five credits; five laboratory periods.

206. CITY ENGINEERING. A study of the necessary precision; a survey of a portion of the city, also of a new addition, including the preparation of plats, establishment of grades, etc.; survey and office work of the preparation of the plans for a street improvement; preparation of estimates, etc.

Prerequisites: C. E. 201, 204.

Senior year; first semester; four credits; one recitation; three laboratory periods.

207. PRECISE SURVEYING AND GEODESY. A study of the precise methods of surveying and leveling, base line measurement, precise triangulation, determination of true meridian and latitude.

Prerequisites: C. E. 201, 204, 206.

Senior year; second semester; three credits; one recitation; two laboratory periods.

211. RAILROAD SURVEYING. This course will include a study of the simple, compound and vertical curves and of earthwork. Students will solve many problems both in the class room and in the field, and will make a complete survey of a railway line a mile or more in length, including a reconnaissance, preliminary survey, location survey, and estimates of earthwork. A limited time will be devoted to the railroad spiral.

Prerequisite: C. E. 201, 204.

Sophomore year; second semester; five credits; two recitations; three laboratory periods.

212. RAILWAY ENGINEERING. Study of the methods of railway construction and maintenance, standard structures, trestles, tunnels, culverts, minor bridges, ballast, rails and rail supports and fastenings, yards and terminals. This course will be preceded by a brief review of the simple and compound curve and the railroad spiral.

Senior year; first semester; three credits; two recitations; one laboratory period.

213. RAILWAY ENGINEERING. Continuation of course 212.

Senior year; second semester; three credits; two recitations; one laboratory period.

301. SANITARY ENGINEERING. Drainage systems of populous districts, including chemical and bacterial purification of sewage;

collection and disposal of garbage; street cleaning; separate and combined water carriage systems; surveys, plans, and specifications; law of flow and determination of size and capacity; brick, terra cotta, cement, and concrete sewers.

Prerequisite: M. E. 202.

Senior year; first semester; three credits; two recitations; one laboratory period.

231. **LEVELING.** This course is designed principally for Agricultural students and consists of problems in chaining, elementary transit work and in leveling. Most emphasis will be put upon the leveling and its application to drainage and general irrigation work. Problems will be given in profile and contour work as applied to farm drainage, road construction, and irrigation.

Prerequisite: Math. 11.

Sophomore year; second semester; Agricultural course. Three laboratory periods with assigned lectures.

236. **TOPOGRAPHIC SURVEYING.** This course is designed especially for those taking the Irrigation Farming course and is an enlargement on C. E. 231. A complete topographic survey and map of an assigned area will be made. Special emphasis will be put on the study of the relation of surface topography to methods of water distribution, drainage, etc., as illustrated by the assigned survey and map. Methods of locating ditches and of making estimates on grading for the same will be studied from the contour map.

Prerequisite: C. E. 231.

Junior year; first semester; three credits; three laboratory periods with assigned lectures where required.

302. **WATER SUPPLY ENGINEERING.** Water supply for populous districts; gravity and pumping systems; pumping machinery stand-pipes, reservoirs, and purification works; the preparation of plans, specifications, and contracts.

Prerequisite: M. E. 202.

Senior year; first semester; four credits; three recitations; one laboratory period, designing and computing room.

303. **IRRIGATION ENGINEERING.** Precipitation, run-off, and stream-flow; measurements of flow in open channels; distribution

systems, headworks and storage reservoirs, and other like topics. Study of a typical project including the preparation of plans and specifications.

Senior year; second semester; four credits; three recitations; one laboratory period.

351. **HYDRAULICS.** This course is a practical application of the principles of hydraulics to irrigation farming. It includes the study of the measurement of water by means of weirs, orifices, and current meters; the study of losses of head in pipe lines and effect on flow.

Senior year; first semester; three credits; division between laboratory and recitation to be adjusted.

401. **ROADS AND PAVEMENTS.** A study of the fundamental principles of location, construction and maintenance of roads, as well as a thorough study of the materials used in road and street building. Asphalt, brick, wood block, stone, concrete and other forms of street pavements are carefully studied. This course is given in connection with a laboratory course, Exp. Eng. 131.

Junior year; first semester; three credits; three recitations.

402. **HIGHWAY ENGINEERING.** Economic grades and proper location for different soils and surfacing materials. Surface and sub-surface drainage. Culvert design and construction. Construction and maintenance of earth, sand clay, oiled earth, gravel, and macadam roads. Dust preventives and road binders. Preliminary surveys and estimates. Specifications.

Senior year; first semester; three credits; three recitations.

403. **HIGHWAY IMPROVEMENT.** A condensed course in Highway Construction and Maintenance for Agricultural students. Special attention will be given to the care of earth roads.

Elective; second semester; three credits; three recitations.

404. **ECONOMICS OF HIGHWAY CONSTRUCTION.** Economic and social advantages of improved roads. The traffic census. Local and centralized systems of control. Highway laws of different states. Organization of construction and engineering forces. Cost data. Methods of handling work. Forms of contract—lump sum, unit price, percentage and cost plus fixed sum.

Senior year; second semester; three credits; three recitations.

501. MASONRY AND FOUNDATIONS. A study of the properties of stone, brick, lime, cement, and concrete as building materials and of their uses in foundations, retaining walls, piers, and dams; the theory of the masonry arch, retaining wall and dam. Recitations, lectures and work in drafting and computing room.

Junior year; second semester; four credits; four recitations.

503. ROOFS AND BRIDGES. Both analytical and graphical methods will be applied to the determination of the stresses in roof trusses under static and wind loads and in simple bridge trusses under static and moving, concentrated, and distributed loads.

Prerequisites: M. E. 200 and 201.

Senior year; first semester; four credits; two recitations; two laboratory periods.

504. ROOFS AND BRIDGES. This course is a continuation of course 503. Draw-bridges, cantilever and suspension bridges.

Senior year; second semester; three credits; one recitation; two laboratory periods.

505. STRUCTURAL ENGINEERING. Continuation of courses 503 and 504. This course will include the original design, with the strain sheets, plans, and working drawings for a roof truss, plate girder, pin-connected bridge and steel arch.

Senior year; first semester; two credits; two laboratory periods.

506. STRUCTURAL ENGINEERING. Continuation of course 505.

Senior year; second semester; three credits; three laboratory periods.

508. DESIGN OF IRRIGATION STRUCTURES. Design of dams, head-works, flumes, pipe lines, reservoirs and other structures connected with irrigation projects. Investigation of stability of important dams now in use in government and private irrigation projects. A complete problem will be worked out in which the structures incident to the construction of an assigned project will be designed and drawings made of the same.

Senior year; second semester; five credits; five laboratory periods.

509. **REINFORCED CONCRETE.** A study of the principles of concrete design as applied to beams, columns, arches and retaining walls.

Prerequisites: M. E. 201, C. E. 501.

Senior year; first semester; three credits; one recitation; two laboratory periods. This course must be accompanied by Exp. Eng. 124.

601. **ENGINEERING SEMINAR.** The members of the senior class in the course in Civil Engineering, and the professors and instructors, constitute the Civil Engineering Seminar which meets once a week. The purpose of this seminar is to bring the student in touch with engineering literature and practice. To this end, a number of journal reviews and papers on engineering subjects will be presented and freely criticised each week. The work will follow a previously arranged program.

Senior year; first semester; one credit.

602. **ENGINEERING SEMINAR.** See course 601.

Senior year; second semester; one credit.

603. **CONTRACTS AND SPECIFICATIONS.** A study of the general principles and laws of contracts as applied to engineering, including the preparation and study of specifications and contracts based upon engineering structures designed by the individual student.

Senior year; second semester; two credits; two recitations.

ELECTRICAL ENGINEERING

Professor Hillebrand

Assistant Professor Shepard

Mr. Wooster

The following courses are offered.

101. **PRINCIPLES OF APPLIED ELECTRICITY.** Study of the sine wave and periodic alternating quantity; harmonic analysis; laws governing the flow of current and energy; the magnetic and electrostatic circuit, production of rotating field by means of polyphase alternating currents in a distributed winding; losses in electric circuits; elementary theory of transmission lines.

Open only to juniors in Electrical Engineering. Course 101 must be taken concurrently with 201, and 102 concurrently with 202.

Junior year; first semester; four credits; four recitations.

102. PRINCIPLES OF APPLIED ELECTRICITY. Continuation of course 101.

Junior year; second semester; three credits; three recitations.

103. ALTERNATING CURRENT MACHINERY. Theory of commutation; the alternator; synchronous motor and converter; transformer; induction motor; series and repulsion motors; polarity in alternating current circuits.

Course 103 may only be taken concurrently with laboratory course 203.

Prerequisites: Courses 101, 102, 201, 202.

Senior year; first semester; three credits; three recitations.

105. PROBLEMS IN DESIGN. Stress is laid upon methods of calculating dimensions or predetermining characteristics. Study of the choke coil, electro magnet, static transformer, one rotating machine. Problems on the synchronous and induction motor, transmission and distribution of energy. Parallels course 103.

Prerequisites: Courses 101, 102, 201, 202.

Senior year; first semester; two credits; two laboratory periods.

106. PROBLEMS IN DESIGN. Continuation of Course 105.

Senior year; second semester; two credits; two laboratory periods.

108. POWER PLANTS, TRANSMISSION AND DISTRIBUTING SYSTEMS. A study of the equipment of power plants, transmission lines, and distributing systems, and of the technical and economic problems connected with the generation, transmission and distribution of electrical energy.

In connection with this course inspection trips are made to the neighboring properties of the Oregon Power Company and of the Portland Ry. Light and Power Company. The expense of these trips will approximate twenty dollars and should be anticipated by every Electrical Engineering student in his senior year.

Prerequisite: Course 103.

Senior year; second semester; three credits; three recitations.

110. ELECTRICAL CONTRACTING. Study of appliances handled

by electrical supply dealers, the National Electrical Code, plans and specifications for interior wiring, systems of cost keeping and economic features of the supply business.

Prerequisite: Course 103.

Elective only to Seniors in Electrical Engineering who plan to engage in the electrical supply business, who may take it in lieu of course 108.

Senior year; second semester; three credits; three recitations.

121. SURVEY OF ELECTRICAL INDUSTRIES. Lectures* and assigned reading on the applications of electricity in intelligence transmission, illumination, transportation, and the industries.

Elective to Freshmen in Electrical Engineering.

Freshman year; first semester; one credit; lecture on alternate weeks, assigned reading and one conference per month.

122. SURVEY OF ELECTRICAL INDUSTRIES. Continuation of course 121.

Freshman year; second semester; one credit; lecture on alternate weeks, assigned reading and one conference per month.

201. ELECTRICAL ENGINEERING LABORATORY. Open only to juniors in Electrical Engineering and must be taken concurrently with 101, which it parallels. Study of electrical instruments; wave form and polarity of alternating currents; current, electromotive force and power relations in circuits involving resistance, inductance and capacity; principles of operation of direct current dynamos and motors.

Consists of one laboratory period a week. Student is required to submit a preliminary report before performing experiment and a final report upon its completion.

Junior year; first semester; three credits; one laboratory period.

202. ELECTRICAL ENGINEERING LABORATORY. Continuation of course 201. Must be taken concurrently with course 102. Study of hysteresis and eddy current losses in magnetic circuits, electromotive force and energy losses in electrical circuits; the separation of losses in direct current machinery; efficiency and loading tests of direct current machinery; properties of insulating materials.

Junior year; second semester; three credits; one laboratory period.

203. ELECTRICAL ENGINEERING LABORATORY. Characteristic performance of alternating current machinery, including alternator, synchronous and induction motor, synchronous converter and static transformer with parallel operation and pump back tests.

Preliminary and final reports are required.

Prerequisites: Courses 101, 102, 201, 202.

Senior year; first semester; four credits; one laboratory period.

204. ADVANCED ELECTRICAL ENGINEERING LABORATORY. Elective, by permission only, to a limited number of students of proved ability, in the senior year. Experiments to be performed will be selected by students after consultation with instructor. Outline and method of test will be prepared by students.

Prerequisite: Course 203.

Senior year; second semester; two credits, one laboratory period.

301. STUDY OF CURRENT PERIODICAL LITERATURE. Presentation of abstracts and discussion of current articles in electrical periodicals. Special emphasis will be laid upon English, address, and manner of presentation.

Elective to seniors in Electrical Engineering.

Senior year; first semester; two credits; two recitations.

This course and 302 will not be given unless elected by at least four students.

302. STUDY OF CURRENT PERIODICAL LITERATURE. A continuation of course 301.

Senior year; second semester; two credits; two recitations.

304. STORAGE BATTERIES. Theory and operation of commercial types of storage battery; engineering application as a power plant auxiliary.

Elective to seniors in Electrical Engineering.

Senior year; second semester; one credit; one lecture.

306. THESIS. Elective, by permission, to seniors in Electrical Engineering. Only those whose past record indicates ability successfully to complete a satisfactory thesis, will be permitted to make this election.

Senior year; second semester; two credits.

308. **ELECTRIC RAILWAYS.** A general study of the application of electricity to street and interurban railways, and of electric railway equipment.

Elective to seniors in Electrical Engineering.

Senior year; second semester; three credits; three recitations.

402. **STUDY OF ELECTRICAL MACHINERY.** Open to non-electrical students in the school of Engineering. A practical course designed to meet the needs of Civil, Mechanical, and Mining Engineers. Class room and laboratory study of electrical instruments, current, electromotive force and power relations; the operation, care, and management of familiar types of dynamos, motors, both alternating and direct current, and transformers.

Required of seniors in Mechanical and Mining Engineering and of certain groups in Civil Engineering.

Prerequisites: Elementary Chemistry, Physics, Calculus, Mechanics.

Senior year; second semester; four credits; two recitations and one laboratory.

Courses in illumination and wireless telegraphy are offered by the department of Physics.

MECHANICAL ENGINEERING

Professor Covell

Associate Professor Phillips

Assistant Professor Jackson

Assistant Professor Graf

Mr. Rosencrants

Mr. Porter

Mr. Knopf

Mr. Ridenour

Mr. McComb

Mr. Wiltshire

Mr. Yoder

Mr. Thayer

The following courses are offered:

100. **MECHANICAL DRAWING.** The use of instruments and the elementary principles of mechanical drawing are taught by a graded

series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, the helix with its application to screw-threads, and finally the complete development of a working blue-print of some simple device from sketches. Particular attention is given to freehand lettering, general neatness, and accuracy.

The courses in Electrical, Mechanical and Mining Engineering; freshman year; first semester; three credits; three laboratory periods.

101. MECHANICAL DRAWING. This is a briefer course than the preceding and is intended to give students who are not taking engineering courses some knowledge of the use of instruments and the elements of mechanical drawing.

The course in Forestry; freshman year; first semester; two credits; two laboratory periods.

103. MECHANICAL DRAWING. A continuation of course 100, including mechanical lettering, line shading, isometric and oblique projection, gear curves and their application to spur, bevel, and worm gearing. Following this is the preparation of a typical set of working drawings, tracings, and blue-prints of a complete machine. Rapid and business-like execution of work is insisted upon at all times.

The courses in Electrical and Mechanical Engineering; sophomore year; first semester; four credits; four laboratory periods.

102. DESCRIPTIVE GEOMETRY. This work consists in the graphical solution of problems involving the projection of lines, surfaces, and solids.

All courses in Engineering; freshman year; second semester; three credits; two recitations and one laboratory period.

120. MECHANISM. A study of mechanical movements, including velocity ratios; transmission of motion by linkwork, gearing, cams, and belting.

The courses in Electrical and Mechanical Engineering; sophomore year; second semester; four credits; two recitations; two laboratory periods.

124. MATERIAL OF ENGINEERING. This is largely a lecture course dealing with the materials used in engineering structures.

Iron, steel, brick, cement, timber, and stone are discussed with reference to their physical properties and adaptability to the purposes of engineering construction.

The courses in Civil and Mechanical Engineering; junior year; first semester; two credits; two recitations.

125. MACHINE DESIGN. This course consists largely in applying the principles discussed in mechanism and in the mechanics to the design of machine parts. The work includes among other things the study of screws, fastenings, shafting, belting, fly wheels, wheels, gearing, and machine frames.

Senior year; first semester; four credits; four recitations.

126. MACHINE DESIGN. This course supplements and is directly dependent upon the recitation work of course 125.

The work is taken up from a practical point of view and applies such theory as is consistent with the approved methods of design. Designs and complete working drawings are made of machines.

Senior year; second semester; four credits; four laboratory periods.

127. STEAM POWER PLANT DESIGN. The work in this course includes the design and working drawings of steam power plant problems. Among other things considered, are the location of plants; the selection of engines, boilers, pumps, and heaters; the general arrangement of parts, including the connections, piping, and auxiliaries.

The course in Mechanical Engineering; senior year; second semester; two credits; two laboratory periods.

200. STATICS AND DYNAMICS. This course treats of the action of forces upon bodies at rest or in motion. Many original problems are worked, and the practical applications pointed out.

All courses in Engineering; junior year; first semester; four credits; four recitations.

Prerequisite: Math. 51 and 52.

201. STRENGTH OF MATERIALS. A study of the strength of materials with special reference to their use in such engineering structures as beams, trusses, girders, and shafting.

All courses in Engineering; junior year; second semester; two credits; two recitations. First half semester.

202. **HYDRAULICS.** This course deals with theoretical hydraulics, including statical pressure, immersion, flotation, and steady flow through pipes and orifices as well as over wires and in open channels. Bernoulli's theorem is taken as the basis for calculation of flow in pipes and through orifices, with such modifications as are required to allow for frictional and other resistances.

All courses in Engineering; junior year; second semester; two credits; two recitations. Second half semester.

204. **HYDRAULIC MOTORS.** The application of the principles of theoretical hydraulics and mechanics to the development of power by means of water wheels, is discussed. The different types of turbines and impulse wheels are considered with reference to their forms and adaptability.

The courses in Mechanical and Civil Engineering; senior year; first semester; two credits; two recitations.

300. **ELEMENTARY STEAM ENGINEERING.** This course deals with the principles of steam engineering in a very elementary manner. Its purpose is to familiarize the student with the type of steam machinery largely used in the logging industry, such as donkey engines, and logging locomotives.

A portion of the time will be spent in the class-room studying the principles of steam formation and power development. A part of the time will be devoted to laboratory work, involving the care and management of the engines and boilers, as well as the use of the steam engine indicator in valve setting and power measurement.

The course in Logging Engineering; junior year; second semester; two credits; one recitation; one laboratory period.

302. **ROAD MACHINERY.** This course is designed to familiarize the student with the purpose, care, and manipulation of the different forms of power driven road machinery, both steam and gas, as exemplified in modern road construction.

The course in Civil Engineering, group II; senior year; first semester; two credits; one recitation; one laboratory period.

305. **THEORY AND PRACTICE OF STEAM ENGINEERING.** This course includes a study of the elementary thermodynamic laws of gases and vapors with reference to their application to engineer-

ing practice, and aims to fulfill the essential thermodynamic requirements of the gas and steam engineer. The work will be supplemented throughout with problems.

Prerequisite: Math. 51 and 52.

The courses in Mechanical and Electrical Engineering; junior year; second semester; three credits; three recitations.

306. ADVANCED STEAM ENGINEERING. A continuation of course 305 in which more time is spent on the application of the principles of thermodynamics to power plant machinery and to a study of the inter-relation of power plant apparatus, including steam prime movers and boilers and their auxiliaries.

The courses in Mechanical and Electrical Engineering; senior year; first semester; three credits; three recitations.

308. COMPRESSED AIR AND REFRIGERATION. A course devoted to the theory, design, and operation of air compressors, fans, and blowers, the first part of the semester, and to the study of the theory and operation of commercial refrigeration systems the latter part.

Prerequisite: Course 305.

Elective in the senior year of the Mechanical and Electrical Engineering courses; first semester; two credits; two recitations.

312. STEAM TURBINES. The steam turbine has taken its place as one of the important factors in transforming energy into work. Hence, the principles involved in its construction and operation should be well understood by engineering students. This course considers the flow of steam through pipes and nozzles and its action on turbine buckets. The effects of superheating are noted and some attention is given to steam turbine design.

Senior year; second semester; two credits; two recitations.

315. INTERNAL COMBUSTION MOTORS. In this course the application of thermodynamics to the internal combustion engine cycles, is studied with reference to the economy of operation. The theory of the combustion of gases and of the gasification of the liquid and solid fuels commonly met with in internal combustion engine practice, is discussed. The remainder of the time is devoted to a study of details, auxiliaries, and operation.

Prerequisite: Courses 305, 306.

Course in Mechanical Engineering; senior year; second semester; two credits; two recitations.

320. HEATING AND VENTILATION. Study of modern methods for the heating and ventilation of buildings. An outline of the work includes a study of several approved systems of heating by means of steam, hot water, or air; methods of computing radiating surface; effective methods of ventilation; general design, construction, and operation of plant.

Elective in the course in Mechanical Engineering; senior year; first semester; two credits; two recitations. Hours to be arranged.

EXPERIMENTAL ENGINEERING

105. ELEMENTARY MECHANICS LABORATORY. A study of experimental investigation; reduction of data; mechanical calculating devices; the preparation of neat and accurate reports. The calibration of various measuring instruments follows, after which are made transverse, tensile, compressive, torsion, and other standard tests of the common materials of construction.

Courses in Mechanical and Mining Engineering (Ceramic and Chemical groups); junior year; Electrical Engineering, senior year; first semester; two credits; two laboratory periods.

106. ELEMENTARY POWER LABORATORY. A continuation of the preceding, including tests of lubricants, calorific power of fuels, flue gas analysis, steam calorimetry, and indicator practice in valve setting. Efficiency tests of steam engine and boiler, gas engine, pumps, water wheel, etc.

Prerequisite: Course 101.

Courses in Mechanical and Mining Engineering (Ceramic and Chemical groups), junior year; Electrical Engineering, senior year; second semester; two credits; two laboratory periods.

107. ADVANCED MECHANICS LABORATORY. A course in experimental work dealing with more advanced studies of materials, fuels, lubricants, bearing metals, belting, etc., with special reference to the application of the results to conditions of actual practice. The work which consists largely of special investigations as assigned, is varied from year to year to suit conditions.

The course in Mechanical Engineering; senior year; first semester; two credits; two laboratory periods.

Elective to seniors in other courses and to graduate students who have completed courses 101 and 102, or an equivalent.

108. ADVANCED POWER LABORATORY. A course similar in nature to the preceding, but dealing with power and hydraulic machinery, heating, refrigeration, and similar studies.

The course in Mechanical Engineering; senior year; second semester; two credits; two laboratory periods.

Elective to seniors in other courses and to graduate students who have completed the preceding.

113. GENERAL ENGINEERING LABORATORY. (Abridged Course). A course intended primarily for students in Mining Engineering electing the Metal Mining group. The group is abridged from courses 101 and 102, and embraces tests on materials, hydraulic equipment and steam and gas engines. One test is made each week and complete reports are required.

Required of students electing the Metal Mining group in Mining Engineering; second semester; senior year; two credits; two laboratory periods.

Students in other courses desiring a short general course in Experimental Engineering will be allowed to elect this course providing they show suitable preparation.

123. STRUCTURAL MATERIALS LABORATORY. Standard tests of timber, iron, steel, brick, stone, etc., with special reference to the specifications and methods adopted by the American Society for Testing Materials and other national engineering organizations. Following the general tests, some time is devoted to work on plain and reinforced concrete.

The course in Civil Engineering; junior year; second semester; two credits; two laboratory periods.

124. ADVANCED STRUCTURAL LABORATORY. This is an advanced laboratory course intended to accompany the work in "Reinforced Concrete," C. E. 509. Tests will be made on plain and reinforced beams and columns to study methods of reinforcing, and to determine in a general way the relative value of the various materials available. Some tests will also be made on the permeability of dif-

ferent mixtures, both plain and when treated with various waterproofing processes.

Required of Civil Engineering seniors electing the Structural or Railway groups.

First semester; one credit; one laboratory period.

125. GENERAL MATERIALS LABORATORY. A condensed course designed especially for students in Architecture. The work begins with elementary tests: Tension, compression, shear, bending, and torsion on specimens selected to best illustrate the action of the different stresses on the various materials. The standard methods of testing Portland cement, stone, brick, and other building materials are studied, and some time is also spent in making tests on plain and reinforced concrete.

Junior year; second semester; two credits; two laboratory periods.

Elective to students with suitable preparation who may desire an abridged course in testing materials.

126. CEMENT TESTING. An experimental study of Portland cement and materials for concrete aggregates. Sampling, study of apparatus, preparation of reports, problems to determine the various properties of the materials, effects of different conditions, comparison of methods; and finally, a complete commercial test.

Required in all groups in Civil Engineering; junior year; first semester; one credit; one laboratory period.

127. TIMBER TESTING. A special course designed to meet the needs of the students in Forestry. Cross-bending, compression, shearing, and other standard tests of timber; a study of the effect of moisture content on strength; comparison of static and impact loads; and, if time is available, some special tests such as holding power of spikes, etc. All formulas necessary for the reduction of the test data will be explained; complete reports will be required on all tests. In general, the methods and bulletins of the U. S. Forest Service will be used as a guide in the work.

Course in Forestry; senior year; second semester; one credit; one laboratory period.

128. LOGGING MATERIALS. A special course designed for the students in Logging Engineering. The work will consist partly

of class work on the strength and general properties of materials, and partly of laboratory work. In the laboratory the necessary general tests will be made to illustrate the behavior of the various materials under different stresses. After this preliminary work, a number of tests will be made on materials of particular interest to the logging engineer, as for example, bending tests on full size timbers, tension tests of cable, rope, and wrought iron tie rods, etc.

Course in Logging Engineering; junior year; second semester; three credits; one lecture; two laboratory periods.

131. ROAD AND PAVING MATERIALS. This course parallels the text book work in Highway Construction, and is conducted mainly on the demonstration plan; it includes the mechanical analysis of sands and aggregates; determination of voids, and a study of mixtures; abrasion, hardness, toughness, recementing, and other tests on macadam rock; tests on paving brick; and standard tests on bituminous compounds.

Required in all groups in Civil Engineering; junior year; first semester; one credit; one laboratory period.

134. ADVANCED HIGHWAY LABORATORY. An advanced course following course 131. Designed particularly for those specializing in Highway Engineering. Complete tests are made on different road and paving materials and their relative value determined. A large proportion of the time will also be spent in the study of road oils and bituminous binders. Reports are required on all tests, and whenever possible results are compared to specifications in actual use.

The course in Civil Engineering, Highway group; senior year; first semester; two laboratory periods. (Not given except by special arrangement.)

141. HYDRAULIC LABORATORY. Calibration of weirs, orifices, water meters, etc. Tests on water wheel, centrifugal and other pumps, hydraulic ram, and measurement of stream flow. Full and complete reports are required.

Required of students in the Hydraulic, Structural or Railway groups in Civil Engineering; junior year; second semester; one credit; one laboratory period.

Shop Work

A. WOODWORK. Mechanic Arts Course. This course in woodwork will be divided into three parts, carried on simultaneously

(a) A lecture course on methods and materials used in Mechanic Arts, including bench equipment, use and care of bench tools; carpentry and laying out work; joinery or putting work together; fastening, structure, and defects of wood; methods of cutting and seasoning; furniture construction and design; wood finishing, painting, staining, varnishing, waxing, and polishing. This will require one hour a week.

(b) One hour a week will be devoted to mechanical drawing and a study of drawings to enable the student to make drawings of the articles which he is called upon to make in the shop and to interpret drawings in general.

(c) A woodwork course, including joinery, primary construction work, furniture construction, and finishing. The purpose of this course is to instil a knowledge of the principles of joinery by teaching the use and care of woodworking tools, and to develop skill in the use of these tools by means of progressive exercises. The application of the joints is shown in the construction of finished products. All of the operations must be methodically and accurately performed, and the finished product have a neat and workmanlike appearance.

Secondary course in Mechanic Arts; first year; first semester; five credits; one recitation; four laboratory periods.

B. WOODWORK. A continuation of course A.

The secondary course in Mechanic Arts; first year; second semester; five credits; one recitation; four laboratory periods.

C. WOODWORK. Mechanic Arts Course. Those who desire to specialize in woodwork may do so by devoting the whole time allotted to industrial work to this branch. Such students will continue along the same lines as indicated in courses A and B, and during the second year will enter upon high grade cabinet work.

The Secondary course in Mechanic Arts; second year; first semester; five credits; five laboratory periods.

D. WOODWORK. A continuation of course C.

The Secondary course in Mechanic Arts; second year; second semester; five credits; five laboratory periods.

E. PATTERNMAKING. Mechanic Arts Course. Those who prefer patternmaking to cabinet work may devote the second year to that subject, following the plan outlined under C and D.

The Secondary course in Mechanic Arts; second year; first semester; five credits; five laboratory periods.

F. PATTERNMAKING. A continuation of course E.

The Secondary course in Mechanic Arts; second year; second semester; five credits; five laboratory periods.

G. WOODWORK. This course will be equivalent to the first six weeks of the Mechanic Arts course A.

It consists of six lectures on the care and use of bench tools, six lessons in mechanical drawing, and twenty-eight laboratory periods in the practical use of the various tools in the way of planing, sawing, chiseling, etc.

In this course each student is required to have a drawing board, T-square, compass, lead pencil, and three sheets of mechanical drawing paper, the cost of which will not exceed one dollar.

The Secondary course in Agriculture and Forestry; second year; first semester; two credits; two laboratory periods.

J. BLACKSMITHING. The student is taught to make and manage the forge fire, to shape iron by bending, upsetting, drawing and welding. The course also includes occasional lectures on the principles involved in managing the fire and in forging.

Elective; second year of the Secondary course in Mechanic Arts; first semester; five credits; five laboratory periods.

K. BLACKSMITHING. A continuation of course J; devoted to making useful articles and tools of iron and steel. A large part of the time is given to making and tempering steel tools. This course is also accompanied by lectures on the different grades of steel and the effects of heat treatment.

Elective; second year of Secondary course in Mechanic Arts; second semester; five credits; five laboratory periods.

L. BLACKSMITHING. After completing the preliminary exercises, the student enters upon work having direct application to

farming and forestry, such as mending of farm implements, making chains, clevises and hooks, ironing whiffletrees and neckyokes, and sharpening tools.

Required in the Secondary courses in Agriculture and Forestry second year; second semester; two credits; two laboratory periods.

M. STEAM-FITTING AND PLUMBING. This course is intended as an aid to those who desire to follow the occupation of steam-fitting or plumbing. The practical work includes the installation of piping for steam, water, or gas; a study of the principles involved in expansion, radiation, and water hammer. The work in plumbing takes up the construction of bends, traps, and various types of wiped joints; also a study of ventilation; the proper arrangement of soil and water pipes, hot water boilers and tanks.

Elective; second year; first semester; five credits; five laboratory period.

N. STEAM-FITTING AND PLUMBING. This is a continuation of course M.

Elective; second year; second semester; five credits; five laboratory periods.

101. WOODWORK. This course, though designed for the Mechanical and Electrical Engineering students, is divided into two courses (a) and (b), because of the lack of Secondary Manual Training in Mechanic Arts in certain parts of the State.

(a) Students who have not had the advantage of Secondary Manual Training in Mechanic Arts will enter the class in bench work for the first semester or until they have developed sufficient skill to enter the advanced work.

(b) Students who have had a year or more of Secondary Manual Training in Mechanic Arts work will enter the class in wood turning preparatory to pattern work.

The course on bench work will consist of a series of exercises in planing, sawing, and chiseling, preceded by a lecture course explaining each step in advance.

The course in wood turning is taken in conjunction with lectures on the lathe, its care and management, and the care and use of turning tools.

After acquiring sufficient skill in turning between centers and chuck turning, the primary principles of patternmaking will be taken up, which is the main feature of the course.

Required in Mechanical and Electrical Engineering courses; freshman year; first semester; three credits; three laboratory periods.

102. **PATTERNMAKING.** The students in Engineering will take up the art of Patternmaking where they left off at the close of the first semester, beginning with simple exercises and advancing until they have made patterns for various parts of machines and other structures such as pulleys, pipe fittings, valves, gear wheels, dynamo frames, and special patterns as assigned. Much of the constructive work collaborates with the exercises required in machine design in building new machines and equipment for the various departments of the College.

The lectures explain the correct methods of constructing the more complicated work; also the principles of moulding directly related to patternmaking; the shrinkage of metals; the warping and twisting of woods; glue and metal fastenings; making cores and core boxes; methods of marking and storing patterns; estimating the weight of metal castings.

The courses of Electrical and Mechanical Engineering; freshman year; second semester; three credits; three laboratory periods.

103. **PATTERNMAKING.** These courses are a continuation of Patternmaking and are intended for engineering students who desire to devote further time to the subject, or for those who are engaged in construction work in the preparation of theses.

The work will consist largely in making patterns for steam and gas engines and other complicated machines.

Elective; three credits; three laboratory periods; first semester.

104. **PATTERNMAKING.** Continuation of course 103.

Elective; three credits; three laboratory periods; second semester.

105. **WOODWORK.** This course is designed for Mining Engineering and Forestry students, and consists primarily of a series of constructive exercises in carpentry and joinery accompanied by one lecture a week dealing with the care and use of bench tools; the use of the steel square in framing and laying out work.

After completing the first constructive exercises which teach the use of the various hand tools, as well as the forms of joints and ties used by good engineering practice in truss and bridge framing, the mining engineering students will take up mine timbering truss and bridge construction relating to the mine; while the forestry students will take up the practical use of the steel square.

Mining and Forestry course; freshman year; first semester; three credits; three laboratory periods.

106. WOODWORK. The purpose of this course is to give instruction in the care and use of modern woodwork benches and their equipment. Six lectures will be given in this course, each lecture followed by a practical application. Skill in the manipulation of tools cannot be obtained in this short time, but instruction and practice will be given in sharpening chisels, planes, and other edge tools; in jointing, setting, and filing hand saws.

The principal feature of this course will be the instruction and practice in the use of the steel square in brace work and rafter construction. As much stress will be placed on planing, sawing, and chiseling exercises as time will permit.

The course in Agriculture; freshman year; first or second semester; two credits; two laboratory periods.

111. WOODWORK. A continuation of course 105 for forestry students. This course will take up the construction of camp buildings; for example, bunk houses, cook camps, stables, etc.

Bridge construction of various kinds will be made a strong feature of the course.

In this, as in all other woodwork courses, the filling out of material bills and estimates of cost of material and labor will be required upon receiving or completing the design of the article to be built before the student is supplied with the required material.

Forestry course; freshman year; second semester; three credits; three laboratory periods.

112. WOODWORK. This course is designed for the architectural students and consists of a series of exercises in planing, sawing, and chiseling, preceded by a lecture, explaining each step in advance.

After a satisfactory working knowledge of the use of the carpenter tools has been accomplished, the practical use of the steel

square in brace and detailed roof construction will be taken up.

This work to be developed through the construction of miniature frames of houses, barns and roofs.

As far as possible, drawings furnished by the architectural department will be used in this work.

Architectural course; freshman year; first semester; three credits; one recitation, two and one-half laboratory periods.

113. WOODWORK. A continuation of course 112. Correct use of the steel square in laying out practical carpenter work; *e. g.*, window and door sills, bay and circular windows, steps, stairs, etc. Detailed construction of the window and door frames, sills, caps, weights, and fastenings in relation to the rough frame work and the exterior and interior finish of the building.

In like manner, the construction of cornices, gutters, brackets, columns, and newel posts will be taken up.

As soon as the students become familiar with the detailed construction of the above, they will be assigned problems involving original design and construction.

Practice in reading plans, filling out material bills, and estimating the cost of material and labor, will be a strong feature of the course.

As far as possible drawings furnished by the architectural department will be used in this work.

Elective; freshman year; second semester; three credits; one recitation; two and one-half laboratory periods.

114. WOODWORK. This course is designed as an elective and may be taken upon the completion of course 106 or its equivalent.

The object of this course is to make a study of labor saving devices and utensils about the farm, their design, construction and location; a detailed study of the parts, their construction and improvement.

115. CABINET WORK. This course will be divided into two parts: (a) Mechanical drawing and design, bringing into practice the proper use of drawing instruments in connection with practical, original, and inventive design. (b) The construction of useful articles about the farm or home; *e. g.*, gates, ladders, hay racks, wood racks, movable fences, singletrees, doubletrees, drags, sleds,

rollers, farm bridges, chicken houses, and the frame and truss work for machinery sheds, horse barns, dairy barns, and house construction.

Elective course in agriculture; sophomore year; first semester; two credits; two laboratory periods.

115. CABINET WORK. This course will be divided into three parts, carried on simultaneously: (a) A lecture course on methods and materials used in cabinet work; various tools and their proper uses, and finishing materials and their application. Equivalent to one hour per week. (b) One hour per week will be devoted to drawing, original, design, and studying of plans, etc. (c) A course giving the correct application of woodwork tools.

Upon acquiring satisfactory skill in the use of bench tools through practical joinery; primary construction work will be taken up. In this work the application of the joints will be shown in the construction of finished products. All of the operations must be methodically and accurately performed and the finished product must have a neat and workmanlike appearance.

The character of the work will be more or less individual and advanced as the student's ability develops.

Elective; freshman year; first semester; three credits; three laboratory periods.

116. CABINET WORK. Continuation of course 115. This course consists of the designing and construction of furniture according to the ability of the individual student. Mixing of stains, fillers, and various finishes, with their application, will be a strong feature of the course.

The character of the work will be a study of the design and construction of drawers and panel work, and primary upholstering.

Elective; freshman year; second semester; three credits; three laboratory periods.

120. BLACKSMITHING. The student is taught to make and manage the forge fire; to shape iron by bending, upsetting, drawing, and welding. Many useful articles are made, consisting of hooks, staples, rings, clevises and chains.

The course in Electrical Engineering; sophomore year; first semester; the course in Mechanical Engineering; sophomore year; second semester; three credits; three laboratory periods.

121. **TOOLMAKING AND TEMPERING.** This course is devoted to the study of the heat treatment of steel as exemplified in making and tempering tools, springs, and other articles of steel.

Prerequisite: Course 120.

The course in Mechanical Engineering; junior year; first semester; one credit; one laboratory period.

The course in Logging Engineering; junior year; second semester; one credit; one laboratory period.

122. **BLACKSMITHING.** A course for students in Agriculture. After completing the first exercises, the student enters upon work having direct application to farming, such as the mending of farm implements, making and mending of chains, clevises, and hooks; ironing of whiffletrees and neckyokes; sharpening of tools.

Elective; freshman year; second semester; two credits; two laboratory periods.

123. **BLACKSMITHING.** A continuation of course 120, for students wishing to take an entire year of blacksmithing.

Elective, sophomore year; second semester; three credits; three laboratory periods.

130. **FOUNDRY PRACTICE.** This course includes a study of the foundry equipment; care and management of cupolas; mixing and melting of iron; moulding in green and dry sand; preparation of cores; casting in iron and brass.

The course in Mechanical Engineering; sophomore year; first semester; three credits; three laboratory periods.

131. **FOUNDRY PRACTICE.** A course in all respects equivalent to course 130.

The course in Electrical Engineering; sophomore year; second semester; three credits; three laboratory periods.

200. **MACHINE SHOP.** The work in the machine shop includes both bench and machine work. Upon first entering the shop, the student is taught the principles of chipping, filing, and hand finishing. This occupies the first half of the semester. Machine work is then taken up through a series of exercises on lathe, shaper, planer, drill press, and milling machine. As soon as accuracy and proficiency are shown on the part of the student, he is assigned to construction work upon engines, dynamos, motors, or machine

tools. One hour of the student's time will be required each week in the class room to attend lectures, work problems, or prepare other work assigned by the instructor.

The course in Mechanical Engineering; junior year; first semester; two credits; two laboratory periods.

201. MACHINE SHOP. A course similar to course 200, designed to meet the requirements of students in Electrical Engineering.

The course in Electrical Engineering; second semester; senior year; three credits; three laboratory periods.

202. MACHINE SHOP. A continuation of course 200 devoted to machine construction and milling machine work. Special attention is paid to economical shop methods of doing work.

The course in Mechanical Engineering; junior year; second semester; two credits; two laboratory periods.

203. MACHINE SHOP. These courses are a continuation of the work outlined in the junior year, and are intended for those who desire to devote further time to this branch, or for those who are engaged upon construction work in the preparation of theses.

Elective; first semester; three credits; three laboratory periods.

204. MACHINE SHOP. Continuation of course 203.

Elective; second semester; three credits; three laboratory periods.

Industrial Arts

The equipment of the shops in the School of Engineering will be utilized wherever practicable, and instruction given by means of lectures and special assignments to keep the purpose of the constructive exercises clearly before the student.

The courses in Industrial Arts are designed primarily to meet the needs of those who are preparing to teach or supervise manual training in the elementary grades, and in the high schools of this State. They are open as electives, however, to other students having the necessary preparation to take up the work, subject to the approval of the deans.

The following courses are offered:

101. MANUAL TRAINING FOR THE ELEMENTARY GRADES. This course deals with the design and construction of exercises suitable

for pupils in the first, second, third, and fourth grades. It includes paper and cardboard construction, weaving, basket and mat work, whittling, stencil cutting, etc.

The student will be required to construct enough of these exercises to form the basis of a course in manual training for the grades mentioned. At least one credit of time will be devoted to lecture and class work showing the adaptation of this work to the general scheme of education and mind development of the child.

The course in Industrial Arts; freshman year; first semester; three credits; one recitation; two laboratory periods.

102. MANUAL TRAINING FOR THE ELEMENTARY GRADES. A continuation of course 101 dealing with the work suitable for the fifth, sixth, and seventh grades. This course includes elementary wood construction, chip carving, stencil cutting, book binding, and Venetian iron work.

The course in Industrial Arts; freshman year; second semester; three credits; one recitation; two laboratory periods.

103. ADVANCED MANUAL TRAINING. Work for the eighth and ninth grades. Wood construction and design, leading to furniture making and cabinet work. Mixing and applying various stains, fillers, shellacs, and varnishes.

The course in Industrial Arts; sophomore year; first semester; three credits; one recitation; two laboratory periods.

104. ART METAL WORK. This course consists of hand wrought metal and enamel work, including hard and soft soldering, the formation of bowls, trays, boxes, lamp shades. The design and construction of furniture fittings.

The course in Industrial Arts; sophomore year; second semester; three credits; one recitation; two laboratory periods.

105. WOOD TURNING AND PATTERNMAKING. The principles of wood turning are taken up with reference to their application to the useful arts. This leads to patternmaking, which forms the greater part of the semester's work. One hour per week of the time will be used for shop lectures and recitations upon topics of vital importance to the work, such as selection of material, fastenings and joints, shrinkage of wood, allowance for shrinkage of metal, etc.

The course in Industrial Arts; junior year; first semester; three credits; three laboratory periods.

106. **PATTERNMAKING.** This is a continuation of course 105 and is intended for those who desire to obtain a more detailed knowledge of the subject. The student will have opportunity to enter more fully into constructive work in patternmaking, by making patterns and core boxes for parts of machines to be built in the college shops.

Elective; junior or senior year; second semester; three credits; three laboratory periods.

120. **FORGING.** This course deals with the equipment of the blacksmith shop, and includes exercises in bending, shaping, upsetting, and welding iron. Some instruction is given also in hardening and tempering steel, and in brazing. The course is accompanied with lectures on the management of the fire, methods of instruction, and shop equipment.

The course in Industrial Arts; junior year; second semester; three credits; three laboratory periods.

130. **MACHINE SHOP.** This course begins with the hand processes of chiseling, filing, and polishing, which are followed by a detailed study of the lathe, drill press, planer, and shaper, taught by means of carefully planned exercises. The course includes one hour per week of lecture or recitation work to supplement the instruction given in the shop.

The course in Industrial Arts; senior year; first semester; three credits; three laboratory periods.

131. **MACHINE SHOP.** A continuation of course 130 in which the student becomes familiar with the more complicated machines such as turret lathes, and milling machines. Shop methods are studied with reference to economical production. The student, as far as possible, enters upon construction of machinery and apparatus for college equipment.

The course in Industrial Arts; senior year; second semester; three credits; three laboratory periods.

140. **FOUNDRY PRACTICE.** Those who take this course are instructed in green sand moulding, core making and setting, pouring castings of iron and of brass, and in the management of cupola and brass furnace.

Elective; junior or senior year; first or second semester; three credits; three laboratory periods from which one hour per week will be taken for lectures upon various phases of the work.

MINING ENGINEERING.

Professor Parks

Mr. Swartley

Mr. Goodspeed

The following courses are offered:

PHYSIOGRAPHY A. The course in physiography is designed especially for the Secondary students in Agriculture. Physiographic processes and features are treated at length, as well as their relation to life, especially to human affairs. Emphasis is placed upon the relation of earth, air, and water to man's activities and interests.

Required of second-year Secondary students in Agriculture. First semester; three credits; three recitations.

101. CRYSTALLOGRAPHY AND BLOWPIPE ANALYSIS. This course is intended as a preliminary one, and is a preparation for the work in Determinative Mineralogy, which follows. Only such portion of the subject is especially emphasized as is of practical value in the determination and proper understanding of minerals. The student is given a thorough drill in the more practical portion of the subject. The course is presented through lectures, textbooks, laboratory work, and individual quizzes. In the laboratory work, each student is required to become thoroughly familiar with crystal forms and combinations by working with the wooden crystal models, and later, with the aid of a pocket lens and contact goniometer, to determine the crystal forms of a greater number of natural crystals.

Prerequisite: Chem. 100 and 101; Math. 11, 21 and 31.

Sophomore year; first semester; five credits; two recitations; three laboratory periods.

102. DETERMINATIVE MINERALOGY. In this course about one hundred and sixty of the most important mineral species are pre-

sented by lectures, in which special emphasis is laid on the recognition of minerals by means of their physical properties and crystal forms. The course is not intended to train the student to determine any mineral whatever, but rather to recognize at sight, with the aid of a pocket lens and knife, such minerals as are likely to be met with in actual mining work. With this object in view, as thorough a drill as time will allow is given in the actual handling and determination of minerals in the laboratory. In the work, each student is expected to handle, to determine, and to be examined on, approximately twelve hundred individual specimens.

Prerequisite: Mining 101.

Sophomore year; second semester; three credits; two recitations; one laboratory period.

121. **PETROLOGY.** The object of this course is to drill the student on all of the more commonly occurring rocks in such a way as to render their identification reasonably accurate. The methods pursued are purely those applicable to the hand specimens without aid of microscopic sections. The subject is presented by means of lectures and textbooks, supplemented by laboratory work.

Prerequisite: Mining 101, 102, 140.

Senior year; first semester; three credits; one recitation; two laboratory periods.

131. **PETROGRAPHY.** This course takes up the optical properties of minerals and follows Petrology by a study of thin sections of rocks by the petrographic microscope. It is an elective course to be limited to such students as are specially qualified to take it.

Prerequisite: Mining 101, 102, 140, 121.

Senior year; first semester; four credits.

140. **GENERAL GEOLOGY.** This study deals with the principles of dynamical, structural, stratigraphic, and historical geology. It includes a discussion of the different agencies, such as atmospheric, aqueous, igneous, and organic, which have been instrumental in producing the earth in its present form and structure. Students make excursions to places of geological interest to verify points discussed in the class room.

Prerequisites: Math. 11, 21, and 31; Chem. 100 and 101.

Sophomore year; second semester; three credits; two recitations; one laboratory period.

141. **AGRICULTURAL GEOLOGY.** This course deals with the origin and nature of soils from a geological standpoint entirely. A study is first made of the main groups of rocks with reference to structure and chemical composition, and followed by a study of rock weathering and the products derived from rock decay.

Prerequisites: Chemistry 100 and 101.

Elective for Agricultural students; junior or senior year; first semester; three credits; two lectures; one laboratory period.

142. **ENGINEERING GEOLOGY.** This includes a discussion of the principles of dynamical and structural geology, as well as a study of the more common minerals and rocks, special emphasis being laid upon structural materials.

Prerequisites: Math. 11, 21, 31; Chem. 100 and 101.

Civil engineers; senior year; second semester; four credits; two recitations; two laboratory periods.

160. **ECONOMIC GEOLOGY.** This course deals with the application of the science of geology in industrial relations and operations. It requires an elementary knowledge of chemistry, mineralogy, and geology, and includes the discussion of the mode of occurrence and origin of minerals and ore bodies, especially those containing the precious metals. Attention is also given to other natural products of economic value, such as coal, iron, petroleum, and building stones.

Prerequisites: Mining 101, 102, 140, 121.

Senior year; second semester; three credits; three lecture periods.

181. **GEOCHEMISTRY.** A study by lectures and in the field and laboratory of silicate rock alteration and clay formation.

Prerequisites: Mining 121; Chem. 301 and 401.

Junior year; first semester; four credits; one recitation; three laboratory periods. (Not given in 1913-14.)

182. **GEOCHEMISTRY.** A study by lectures, field and laboratory work, of metamorphism, and ore deposition.

Prerequisite: Mining 181.

Junior year; second semester; four credits; one recitation; three laboratory periods. (Not given in 1913-14.)

185. ORE DEPOSITS. A study of economic geology from the standpoint of the Mining Engineer with special reference to deposits of the valuable metals.

Prerequisite: Mining 160.

Senior year; first semester; five credits; three lectures; three laboratory periods. (Not given in 1913-14.)

186. FIELD GEOLOGY. Study of geologic processes and results as seen in the field. Class will make trips to nearby regions of special geological interest.

Prerequisite: Mining 121.

Senior year; second semester; five credits; three lectures; three laboratory periods. (Not given in 1913-14.)

190. GEOLOGY OF OREGON. This course consists of a study of the geology of Oregon including the structural, historical, and dynamical geology of the State.

Prerequisite: Mining 121.

Senior year; second semester; three credits; three lectures. (Not given in 1913-14.)

192. HISTORICAL GEOLOGY. This is a course of lectures on historical geology and paleontology. The various plant and animal forms characteristic of different eras are described in detail.

Prerequisites: Mining 140; Botany 20 and 21; Zoology 1 and 102.

Senior year; second semester; two credits; two lectures. (Not given in 1913-14.)

199. PRACTICAL GEOLOGY. All mining students will be required to do at least two months' practical work in mines, smelters, geological surveys, cement mills, clay works, or other industrial plants which are closely related to the course which the student is pursuing. This work will be required before the student enters upon the senior year of his college work, and evidence of the nature, quality, and sufficiency of the same will be passed upon by the department before credits will be given. While the minimum requirement is two months, the department urges that the freshman, sophomore, and junior summer vacations be entirely devoted to industrial work along the student's chosen line. This work is most important both from the standpoint of increasing the

students's insight into the technical subjects in the department and in giving him enthusiasm in this work.

201. ROCK AND EARTH EXCAVATION. This course deals with a discussion of the various methods and operations involved in opening up and operating quarries as well as tunneling and shaft sinking. Some of the more important subjects treated are: Methods of stripping, drilling, blasting, and crushing rock, and preliminary examination to determine quarry site. Close attention is paid to cost of all the different operations.

Prerequisites: Mining 140; Physics 101 and 102.

Junior year; first semester; two credits; two lectures.

202. ROCK AND EARTH EXCAVATION. Continuation of course 201.

Prerequisite: Mining 201.

Junior year; second semester; two credits; two lectures.

205. MINING METHODS. This is a study of the various methods used in securing the mineral products. The subject includes methods of timbering, methods of mining, pumping, ventilation, transportation, hoisting, mine sampling, and reporting, installation of machinery, and surface improvements. The subject is presented largely through lectures and directed reference work.

Prerequisite: Mining 202.

Senior year; first semester; three credits; three lectures.

206. MINE ECONOMICS. This course takes up in detail the cost of extracting from mines under varying conditions, gold, silver, copper, iron, and other metal ores, as well as coal.

Prerequisite: Mining 205.

Senior year; second semester; four credits; three lectures; one laboratory period.

220. MINE SURVEYING AND MINING LAW. This course supplements the course in General Surveying, taken in the Civil Engineering department. The student is taught the methods used in locating and patenting mining claims, and in underground surveying. Instruction is given in carrying the meridian into the mine, laying out the workings, keeping notes, estimating areas and tonnage, the plotting of notes, construction of maps, and many other duties which are usually assigned to the Mining Engineer. Consid-

erable time is given also to the study of the laws regulating the location, possession, and operation of mineral rights in the United States.

Prerequisite: Civil Engineering 201.

Junior year; second semester; three credits; one lecture; two laboratory periods.

249. POWER EQUIPMENT. A discussion of the sources of power, water, hydro-electric, steam, gas, and compressed air, together with their practical application to mining operations.

Prerequisites: Mechanical Engineering 200, 201, and 202.

Senior year; first semester; three credits; three lectures.

260. ORE DRESSING. A discussion of the various methods of concentration and the mechanical preparation of ores for metallurgical treatment. The subject is studied under the following main divisions: Jaw and gyratory breakers; rolls; stamps; special, and fine grinding apparatus; sizing apparatus, such as the various types of screens and classifiers; concentrating machinery, including jigs, tables, and vanners.

Prerequisites: Mining 140, 102, 301.

Junior year; second semester; four credits; two lectures; two laboratory periods.

299. PRACTICAL WORK IN MINING. For description see course 199.

301. FIRE ASSAYING. Instruction is given in the assaying of gold, silver, and lead in ores and metallurgical products by scorification and crucible methods. The student is given a thorough drill in the theory and reactions involved, supplemented largely by laboratory work, the subject being treated from a scientific and rational point of view, rather than by "rule of the thumb." Each student is required to make a large number of assays upon previously sampled pulps, which he must check within very close limits.

Prerequisites: Chemistry 301 and 401; Mining 102.

Junior year; first semester; four credits; one lecture; three laboratory periods.

321. INDUSTRIAL CALCULATIONS. This course is a study of such industrial materials as fuels, refractories, slag, etc., from a quantitative physical and chemical standpoint. Different kinds

of pyrometers and calorimeters are studied, various fuels are compared; furnace materials and designs for diverse operations are taken up in detail and enough problems are worked to enable the student to solve all ordinary problems of this nature.

Prerequisites: Physics 100 and 101; Chemistry 301 and 401.

Junior year; first semester; four credits; three lectures; one laboratory period.

325. **METALLURGY OF LEAD AND COPPER.** This is a study of the furnaces, appliances, operation, and materials involved in the extraction of these metals from their ores, and in refining them. The important principles underlying these operations are emphasized throughout.

Prerequisite: Mining 321.

Senior year; first semester; four credits; four lectures.

341. **CYANIDATION OF ORES.** This is a detailed study of the cyanide process of extracting gold and silver from ores. The chemical principles of solution and precipitation are first mastered; then the operation involved and the many mechanical devices in use are taken up minutely. Catalogues of leading manufacturers are used freely to get in mind clearly the details of the latest appliances.

Prerequisites: Chemistry 401; Mining 301.

Senior year; first semester; three credits; three lectures.

342. **METALLURGICAL LABORATORY.** Each student in this course by laboratory tests determines the fitness of an allotted ore for cyanide treatment and then finds the extraction by different methods, and finally by studying costs selects the process which will give the greatest net returns.

Prerequisite: Mining 341.

Senior year; second semester; three credits; three laboratory periods.

399. **PRACTICAL WORK IN INDUSTRIAL CHEMISTRY.** For description see course 199.

402. **CLASSIFICATION AND PHYSICAL TESTING OF CLAYS.** The properties of clays and other ceramic materials. Identification of varieties met in practical work.

Prerequisites: Mining 102; Physics 101 and 102; Chemistry 301 and 401.

Junior year; second semester; five credits; two lectures; three laboratory periods.

404. MINING AND PREPARATION OF CLAY. Methods, appliances, and costs of extracting and preparing clays for various uses are studied by lectures and laboratory methods.

Prerequisites: Mining 102; Physics 101 and 102; Chemistry 301 and 401.

Junior year; second semester; three credits; two lectures; one laboratory period.

421. BODYMAKING, DESIGNING, AND SHAPING. Composition of all classes of ceramic wares; physical and chemical changes produced by blending of various ceramic materials; machinery and processes employed in shaping the various products.

Prerequisites: Mining 402, 404.

Senior year; first semester; five credits; five laboratory periods.

442. DRYING AND BURNING. Methods of drying and burning clay wares; types of construction of industrial kiln plants; chemical and physical processes involved.

Prerequisites: Mining 402, 404.

Senior year; second semester; five credits; two lectures; three laboratory periods.

450. GLAZING. The production of glazes and enamels; classification; properties and defects common to each class; the effect of variation in composition; modes of application.

Prerequisites: Mining 402, 404.

Senior year; second semester; three credits; three lecture periods. (Not given 1913-14.)

462. CEMENT: MATERIALS AND MANUFACTURE. Lime, cements, plaster, and other cementing materials; composition; re-actions; methods of manufacture.

Prerequisite: Mining 402.

Senior year; second semester; four credits; one lecture; three laboratory periods.

SCHOOL OF COMMERCE

Professor Bexell
Professor Macpherson
Professor Horner
Professor Dubach
Assistant Professor Simpson
Mr. Lemon
Mr. _____
Mr. _____

The following courses are offered:

A. **COMMERCIAL ARITHMETIC.** Successful accountancy is based largely upon the ability to use figures. The student is supposed to have acquired fair ability at figures in the grades, but in this course a review of all the essential operations is given. Special stress is laid on short methods and daily drills. Rapid calculation, computations in the various phases of percentage, as applied to commercial transactions, will receive special emphasis. A great variety of commercial forms are studied in this course as a preparation for the formal work in bookkeeping.

Secondary course; first year; first semester; five credits; five recitations.

B. **BOOKKEEPING.** The fundamentals of bookkeeping by double and single entry. The laws of debit and credit are studied and illustrated by correspondence and office practice; exercises in checking, construction, and interpretation of balance sheets; much practice in commercial correspondence; writing bills, invoices, receipts, bills of lading, legal forms, etc.

Secondary course; first year; second semester; five credits; five recitations.

E. **FARM ACCOUNTING AND BUSINESS METHODS.** A thorough course in the essentials of business methods required on a well managed farm. Financial accounts and statement; cost accounts and special records; business organization, business correspondence and forms; household and personal accounts.

The Secondary course in Forestry, first year; the Secondary course in Agriculture, second year; first semester; two credits; two recitations. This course may also be taken by correspondence.

F. BUSINESS METHODS. The first part of this course is similar to course E, but in the latter part of the course the principles of accounting and business methods are applied to the shop and small factory.

Secondary course in Mechanic Arts; second year; second semester; two credits; two recitations.

K. CIVIL GOVERNMENT AND ADMINISTRATION. (a) *Civil Government*. Our European ancestors; origin of states and state institutions. English and American governments compared; federal and state constitutions; state and foreign service; the executive departments; federal and state power; political parties and issues.

(b) *Federal and State Administration*. A survey of the administrative activities of federal, state, and municipal governments; governments from the sociological point of view. The financial operations, preparation of budgets and reports, will be considered.

Secondary course; second year; first semester; three credits; three recitations.

L. ELEMENTARY COMMERCIAL LAW. An elementary course covering the law of contracts; negotiable instruments; agents; partnership; real estate, etc. Adapted for students with limited preparation. This course may also be taken by correspondence.

Secondary course, advanced; second year; Commerce, Mechanic Arts; first semester. Second year, Agriculture and Forestry; second semester; two credits; two recitations.

M. ELEMENTARY COMMERCIAL LAW. Problems and applications of the principles acquired in course B.

Secondary course in Commerce; second semester; two credits; two recitations.

R. TYPEWRITING. Elective in all courses; first semester; two credits; two laboratory periods.

S. TYPEWRITING. Continuation of Typewriting R. Elective in all courses; second semester; two credits; two laboratory periods.

U. PENMANSHIP. Students entering the first year are expected to have acquired a good hand in the grades, but considerable time is devoted during the first year to mastering the best form of business writing and lettering.

Secondary course; first year; first semester; one credit; two periods.

V. PENMANSHIP. A continuation of course U.

Second semester; one credit; two periods.

W. ADVANCED PENMANSHIP. Special emphasis is laid on rapid business writing, correct forms of business papers, lettering and designing.

Secondary course; second year; first semester; one credit; two periods.

X. ADVANCED PENMANSHIP. A continuation of course W.

Second semester; one credit; two practice periods. Required of all commercial students; elective to others.

Y. ADVANCED PENMANSHIP. A continuation of course X.

Freshman year; first semester; one credit; one period.

Z. ADVANCED PENMANSHIP. A continuation of course Y.

Freshman year; second semester; one credit; one period.

BUSINESS ADMINISTRATION

100. ACCOUNTING. A thorough course in modern accounting as practiced in the best business houses throughout the country. Accounting terminology; the laws of debit and credit; business practice in retailing, wholesaling, banking, and transportation. The student becomes familiar with a great variety of labor-saving forms used in the modern business office; the actual forms used by typical concerns in all parts of the country are studied and compared. Manifolded and labor-saving devices of all kinds are studied with constant view to secure greater accuracy and to diminish work.

Freshman and second year of Secondary course; first semester; five credits; one recitation; four laboratory periods.

101. ACCOUNTING. A continuation of course 100.

Second semester; five credits; one recitation; four laboratory periods.

102. ADVANCED ACCOUNTING. A thorough study of bank and advanced accounting and auditing. Various systems are studied and compared. Office practice and intercommunication work similar to that described under courses 100 and 101 form a part of this

course; but here the student assumes the management of the office while the routine work is done by less advanced students.

Prerequisites: Courses 100 and 101.

Sophomore year; first semester; five credits; two recitations; three laboratory periods.

103. **ADVANCED ACCOUNTING.** The accounts of a manufacturing corporation are opened, conducted, and closed. The corporation accounts are kept according to the most approved modern methods, with a view to furnishing accurate detailed information as to cost of products and conditions of the business. The student continues as manager of one of the laboratory offices; numerous reports and discussions.

Sophomore year; second semester; five credits; two recitations; three laboratory periods.

104. **COST ACCOUNTING.** This course is intended to cover the broader, economic, phases of accounting. Emphasis is laid on accounts as means of administrative control and economy of production. After a complete analysis of a system of manufacturing, cost, records, and accounts, a comparative study is made of various systems suitable for particular enterprises.

Prerequisites: Courses 100, 101, 102, 103.

Elective; senior year; first semester; three credits; two recitations and lectures; one laboratory period.

106. **PUBLIC ACCOUNTING AND AUDITING.** This course embraces the following subjects: (1) Analysis and interpretation of accounts and financial statements; terminology and procedure; accounting certificates and reports; designing and installing systems; organization and methods of a typical firm of public auditors; a comparative study of the C. P. A. laws of several states. (2) The discussion and solution of different problems selected from C. P. A. examinations.

Prerequisite: Course 104.

Elective; senior year; second semester; three credits, two recitations and lectures; one laboratory period.

107. **GENERAL ACCOUNTING.** An abridgement of Course 100. Open to all students except those who take Course 100. Either semester; three credits; three recitations.

108. **SPECIAL ACCOUNTING.** The student is given an opportunity to apply the principles of accounting to his special needs. Open to all students except those who take course 101.

Prerequisite: Course 107 or equivalent.

Second semester; three credits; three recitations.

110. **BUSINESS MANAGEMENT.** (a) Firms and Joint Stock Companies. A study of the internal management of a large business; the different duties of the various departments; the advantages of different methods of organization as regards economy and efficiency; value of trade-marks, patents, local interest, etc.

(b) Corporations: The growth of corporations; their causes and forms; the promotion, financiering, incorporation, and capitalization of corporate consolidation; their organization and securities; position and relation of stockholders and directors; receiverships and reorganizations.

(c) A brief discussion of parliamentary practice and procedure as applied to corporate business.

Junior year; first semester; three credits; three recitations.

111. **THESES.** A research course and treatise on the organization and management of a business in which the student is especially interested. The subject of the thesis must be chosen at the time of registration and a complete outline approved by the professor in charge not later than November first. When the thesis is approved, a bound (either printed or typewritten) copy must be deposited in the college library.

Prerequisite: Com. 104 and 110. Open only to seniors.

Both semesters; two credits.

112. **THEORY AND PRACTICE OF ADVERTISING.** A study of the fundamental principles of modern advertising. Special emphasis is given to the peculiarities of composition in newspaper and circular advertising, proof-reading, effectiveness of design, illustration, coloring, and display, follow-up systems, etc.

Junior year; second semester; three credits; three recitations.

122. **HOME AND PRIVATE BUSINESS MANAGEMENT.** This course is designed to cover such business methods as are met in the daily life of the average citizen. The first half of the course is given to the study of accounting as applied to the household and private

business. In connection with this work, the subjects of banking, borrowing and lending, buying and selling, and other features of private and home finance are given consideration. In the second part of the course, contracts, negotiable instruments, commercial correspondence, and commercial forms and business organizations are considered to the extent the time permits.

Domestic Science and Art; sophomore year; second semester; two credits; two recitations.

124. PHARMACY ACCOUNTING. A course in the theory and practice of accounting and business methods especially adapted to the drug business.

The course in Pharmacy; sophomore year; second semester; two credits; two recitations.

126. ADVANCED ARITHMETIC. This course is designed as an advanced course in commercial arithmetic. To do successful work in this course, the student should have a thorough knowledge of all the fundamental operations of arithmetic, including the various phases of percentage and interest. Emphasis is laid on computations of the more difficult problems connected with partnership and corporation settlements, balance sheets and statements, equation of accounts, partial payments, savings-bank accounts, compound interest, stocks and bonds, life insurance, and annuities, partly for the information obtained in the various subjects and partly for the drill afforded in the use of figures. Daily drills are given in short methods and rapid calculation.

Freshman year; first semester; three credits; three recitations.

POLITICAL ECONOMY

200. COMMERCIAL GEOGRAPHY. The main topics treated are: Natural conditions affecting commerce, human control of commerce, transportation and commercial routes; discussion of the leading countries of the world under the following heads: Climate, natural features, distribution of leading products, vegetable food products, vegetable and animal fibres, wood crop, minerals, manufacture, agriculture, and such collateral topics as may be necessary to supplement the work outlined. This course presupposes a fair knowledge of mathematical and political geography, and of general history.

Freshman year; first semester; three credits; three recitations.

201. **COMMERCIAL GEOGRAPHY.** An abridged course adapted to Domestic Science students.

Sophomore year; first semester two credits; two recitations.

205. **HISTORY OF COMMERCE — TRADE.** The development in Egypt, Greece, Rome, Florence, Mediaeval Europe, etc., down to and including the commercial nations of modern times. Special attention is given to materials and machinery of commerce, to trade routes, and to the relations between commercial developments and other branches of the history of civilization. The principles of modern wholesaling and retailing are discussed, and a description given of brokerage, jobbing, the commission business, general and special stores, department stores, and mail order houses.

Freshman year; second semester; three credits; three recitations.

206. **ECONOMIC HISTORY OF THE UNITED STATES.** This course deals with the economic aspects of the development of the United States. The problems of transportation and commerce, agriculture and manufacturing, the labor supply, money and banking, the protective tariff, etc. A careful study will be made of colonial conditions; and the economic causes and effects of the revolution, westward expansion, slavery and the Civil War, the War of 1812, etc., will be clearly outlined.

Prerequisite: Course 200.

Sophomore year; second semester; four credits; four recitations.

210. **PRINCIPLES OF ECONOMICS.** A discussion of wealth; nature and requisites of production; exchange and distribution; the relation of the production of raw material to manufacturing and exchange of products; diminishing returns from natural agents; labor and its increase; efficiency of production; credit, interest, wages, prices, and rent; taxation, public debt, free trade, and protection; money and banking; the labor problem and co-operation.

Prerequisite: Course 200 or 206.

Sophomore year; first and second semesters; four credits; four recitations.

213. **LABOR PROBLEMS.** A study of the rise, structure, government methods and achievements of labor organizations. The ends

sought, the trade agreement, the boycott and strike, the application of the injunction in labor disputes, political activity of labor organizations, woman and child labor, irregularity of employment immigration, conciliation and arbitration, employers' liability laws, working men's insurance, profit sharing and co-operative experiments in relation to the labor problems.

Prerequisites: Courses 210, 233.

Elective; senior year; second semester; three credits; three recitations.

214. **ADVANCED ECONOMICS.** This course takes up the history of economic thought with special reference to the relations which have existed between economic theories and the practical, social, industrial, and commercial policies of the leading nations. Lectures, text-book, and library work.

Senior year; first semester; three credits; three recitations.

215. **ADVANCED ECONOMICS—RESEARCH COURSE.** This course grows out of course 214. In the light of our historic study, an analysis will be attempted of such economic topics as have become present-day political questions. Each student will prepare a thesis embodying the results of research work done under the guidance of the professor in charge. The texts studied and topics discussed will vary from year to year.

Prerequisite: Course 214.

Senior year; second semester; three credits; three recitations.

219. **RURAL ECONOMICS.** The fundamental principles of production, distribution, and exchange, with special reference to rural life. The financial management of the farm receives special attention.

The course in Agriculture; sophomore year; first semester; three credits; three recitations.

This course may also be taken by correspondence.

230. **MONEY AND BANKING.** (a) *Money.* Money as a commodity, coinage, legal tender, gold standard, International Monetary Conferences, colonial bills of credit, revolutionary bills of credit, greenbacks, Confederate currency, silver dollars, panic of 1893, present conditions and problems.

(b) *Banking.* Practice and legal principles of banking, methods of raising capital, modes of organizing national and state banks,

trust and finance companies, clearing houses, their practice, regulations, and importance; resources of a bank, and modes of lending them; duties of directors, president, cashier, tellers, bookkeepers, etc.; public and private examinations and audits.

Prerequisite: Course 210.

Junior year; first semester; three credits; three recitations.

233. CORPORATION AND PUBLIC FINANCE. (a) *Public Finance*.

History of financial systems, theories of public expenditures, various methods and practices of taxation and other sources of income, public credit, relations of the Federal Treasury to our monetary system; the preparation of financial budgets and reports form an important part of this course.

(b) *Funding Operations and Corporation Finance*. Money, funds, and credit, obtaining funds by inheritance, exchange, sales of commercial credit, long-time paper, etc. Funding operations by the United States Treasury; the savings bank, building and loan associations, commercial banks, trust companies, brokers, and insurance companies. The general practice of funding corporations and other large business enterprises.

(c) *Insurance*. Origin, purpose, development and growth of the various kinds of insurance, especially fire, life, casualty; the various plans, policies, and rates will be discussed; computation of tables, and the various phases of actuarial practice will receive attention.

Junior year; second semester; three credits; three recitations.

234. OREGON STATISTICS. This course will consist of an introduction to the theory and method of statistics, with an application of the statistical method to the study of Oregon conditions. The practical side of the course will aim to co-operate with the work of the Bureau of Statistics which is under the supervision of the School of Commerce. The Resources of the State, its Commerce and Trade, Immigration, Vital Statistics, etc., will be made subjects of theses to be worked up under the direction of the instructor in charge.

For the College Year 1913-14 this course will not be given separately, but will be taken up as part of the work of Advanced Economics.

240. **TRANSPORTATION.** The relation of transportation system to industrial and commercial progress; a brief historic review of the development of systems of transportation; the organization and financing of different systems; the effects of competition in the railroad business; freight classification, and the making of rates and fares; the necessity of government control, and attempts at regulation by state and federal governments; government ownership in the light of European experience.

Prerequisite: Course 210.

Elective; junior or senior year; second semester; three credits three recitations.

250. **PRACTICAL SOCIOLOGY.** In this course, social theory will be subordinated to the study of practical social problems. The different social and political units, such as the family, school, church, club, city, state, and nation will be discussed in their relation to the general welfare. This will necessitate an examination of the organization, purpose, and methods of each of these functional groups, involving a discussion of the training of children, employment of women and children, marriage and divorce, the labor movement as a factor in the struggle for existence, overcrowding in city slums, and its amelioration, the causes of pauperism, immorality, and crime, with modern methods of their treatment, etc. A good general text-book will be studied and the whole field covered in class discussion.

Elective; juniors or seniors who do not take Rural Sociology; second semester; three credits; three recitations.

252. **RURAL SOCIOLOGY.** This course will deal with the special problems of the rural family, the rural school, the rural church, rural societies and associations, and the relation of the State to the general rural welfare. This will involve an inquiry into the prevailing ideals of the rural community regarding labor and leisure; art, literature, and music; and the necessity for recreation. Recent progress in adapting education to rural needs will be discussed. City overcrowding will be examined from the rural point of view, and the lessons which the rural community can learn from the progress made by cities in solving their problems will be emphasized. The social and educational effects of the

telephone, free mail delivery, rural press, and improved methods of agricultural production and exchange will be discussed in detail. The best text-books in the field will be carefully studied, and the whole ground covered in class discussion.

Elective to juniors and seniors in Agriculture, and to such juniors and seniors in Domestic Science as may prefer this course to the one in Practical Sociology; second semester; three credits; three recitations.

260. CO-OPERATION. This course takes up the origin and development of the co-operative movement in Europe and its introduction into the United States. It sets forth the general principles underlying the economic and social activities of co-operative associations. Then, following this, the different types of organization, the methods by which they are formed, their working plans in different enterprises, and the factors which determine their success or failure, will be studied in detail. The store, the factory, the dairy and cow testing association, the credit organization, etc., will be taken up systematically, and the advantages and difficulties of co-operation will in each case receive careful analysis.

Elective for juniors and seniors who cannot take 264 and 265, and who have had considerable training in political economy. Not intended for students of agriculture. Junior or senior year; second semester; three credits; three recitations.

264. THE ECONOMIC ORGANIZATION OF AGRICULTURE. This course together with 265, is designed to give a more specialized training in the economic problems of agriculture than is possible in the general course outlined under 219.

In both courses 264 and 265, economic problems are discussed from the standpoint of the efficiency to be attained through closer organization. Existing associations of farmers both in this country and in Europe will be carefully studied by means of sample constitutions and by-laws, and also by lantern-slide illustrations of the work actually being accomplished through co-operation in Europe and America. The aim is to turn out men trained to play their part in the revolution in agricultural business methods which is now sweeping over this country.

(a) *Economic Problems of Production and Marketing.* Old methods and their weakness are examined, and the possible savings through organized business are investigated.

(b) *The Purchase of Farm Supplies.* The purchasing end of the farm business is about as important as the selling of farm products. Present methods will be taken up in detail, and the possibility of eliminating waste and duplication thoroughly discussed and illustrated.

(c) *The Problems of Transportation as Affecting the Farmer.* The economic significance of the good roads movement will be dealt with; systems of rail and water transportation will be taken up, government control discussed, and the possibilities of eliminating waste through precautions on the part of the shippers pointed out.

Open to all who have had 219 or its equivalent; junior year; first semester; three credits; three recitations.

265. RURAL FINANCE. (a) *Rural Taxation.* The general principles of public finance will be taken up in so far as may be necessary to lay the foundation for an intelligent discussion of rural taxation; existing systems, as well as proposed reforms, will be examined.

(b) *Rural Insurance.* The basis of insurance of different kinds will be taken up, and applied to agricultural needs; old line, mutual, and fraternal organizations will be examined from the standpoints of efficiency and safety.

(c) *Rural Credit.* The principles of money, credit, and banking will be sufficiently studied to lay the foundation for the examination of the credit needs of rural communities and the most economical means of satisfying them. The reasons why farmers have been so poorly served by existing credit institutions will be investigated. The credit institutions of Europe will be compared with those of the United States; the development of co-operative credit in European countries will be carefully studied, and the present widespread movement to adapt co-operative credit institutions to American rural conditions will be closely followed.

Open to all who have had 219, or its equivalent.

Junior year; second semester; three credits; three recitations.

POLITICAL SCIENCE

300. ADVANCED COMMERCIAL LAW. (a) *Contracts in General.*

Formation of contracts; offer, acceptance, form, and consideration; competence of parties, consent, and legality of subject matter; operation of contracts, including limit of obligations and assignments; interpretation, rules of evidence and construction; discharge of contracts; the agreement performance, breach of contract, etc.

(b) *Negotiable Instruments.* Maker's, acceptor's, drawer's, and indorser's contracts; proceedings before, upon, and after dishonor; proceedings in protesting; accommodation papers; grantor and surety; holder's position, defense, equities, agency insurance, etc.

Junior year; first semester; three credits; three recitations.

301. ADVANCED COMMERCIAL LAW. (c) *Partnership Law.*

Formation of partnerships, essentials, liability of members, capital, profits, good will, individual and firm property; agency for partners; dissolution, winding up, priority of distribution, etc.

(d) *Corporation Law.* Kinds, formation, powers, liabilities, ownership, shares, subscription, calls, notice, transfers, management, officers, directors, contractional powers, dividends, dissolution, are discussed fully from the legal point of view. The Case method is used throughout the entire course. Lectures, discussions, and reports.

Junior year; second semester; three credits; three recitations.

302. INTERNATIONAL LAW. Persons concerned; rights and duties of states; territorial jurisdiction; jurisdiction on the high seas; agents of the state treaties; settlements of disputes; war and its effects; military occupation; neutrality, contraband, blockades, etc.

Elective for seniors; first semester; three credits; three recitations. Hours to be arranged.

306. COMMERCIAL LAW. A course in the laws of business, especially adapted to the students in Pharmacy.

Sophomore year; first semester; two credits; two recitations.

320. CONSTITUTIONAL LAW AND POLITICS. (a) *Constitutional Law.* The Constitution; rise of the American Union; distribution

and powers of the Government; powers of Congress; powers of the executive; the judicial departments; checks and balances of governments; governments of territories and colonies; admission of new states; amendments to the Constitution; civil rights and their guarantees; protection of persons accused of crimes; protection of contracts and property, etc. Lectures, readings, reports and thesis.

(b) *American Politics*. Origin of political parties in the United States; changes, growth and development; party platforms.

Elective for juniors and seniors; first semester; three credits; three recitations.

322. STATE AND MUNICIPAL GOVERNMENT. A study of the functions of state government; the machinery of state government; political parties in state government; special study of the government of the State of Oregon; municipal government, including county, town, and city government.

Elective for juniors and seniors; second semester; three credits; three recitations.

324. INTERNATIONAL RELATIONS. (a) *Commercial Treaties*. An historical and critical study of important commercial treaties; protective tariffs, and the theory of reciprocity; a survey of the chief questions connected with the history of our foreign relations from the appointment of the Committee on Foreign Relations in the Continental Congress to the present time.

(b) *The Consular Service*. The growth and importance of the consular service; the appointment, distribution, duties, and necessary qualifications of consuls. Studies and discussions of consular reports.

(c) *International Transportation*. The course deals especially with the merchant marine of the principal nations of the world. Importance of ship subsidies, inland waterways, canals, etc.

Elective; senior year; second semester; three credits; three recitations.

STENOGRAPHY

400. STENOGRAPHY AND TYPEWRITING. (a) *Gregg Shorthand*. After a thorough mastery of the principles of shorthand, special

drills in reading and word-building exercises are taken up, followed by a series of "principle" letters which gives the student a thorough and comprehensive review of the entire system.

(b) *Touch Typewriting*. By the use of a series of specially arranged exercises, the student becomes familiar with the keyboard and learns correct fingering by the touch or "sightless" method. Special attention is given to the proper care and mechanism of the machine. The various standard makes of machines are studied and compared.

Second and freshman years; first semester; five credits; five laboratory periods.

401. STENOGRAPHY AND TYPEWRITING. A continuation of course 400, with special emphasis on the application of principles. Special shorthand penmanship drills are taken up with a view to further developing the accuracy and speed of the student. Dictation covering various lines of business correspondence is given and must be transcribed on the machine. Manifolding, stencil cutting, and the use of the mimeograph, neostyle, and letterpress are learned.

Second and freshman years; second semester; five credits; five laboratory periods.

402. ADVANCED STENOGRAPHY AND TYPEWRITING. (a) The student must have become thoroughly grounded in the principles of shorthand and have acquired a speed of a hundred words a minute before taking up this work. Various forms of correspondence, legal documents, speeches, specifications, editorial matter, court testimony, etc., are taken up. Much time is devoted to transcribing, and great care must be given to the arrangement and neatness of the transcribed work. Each student will be called upon to serve as stenographer to different members of the faculty from four to six weeks during the last semester of his course.

(b) *Typewriting, Manifolding, and Filing*. An advanced course for those who specialize in stenography. In addition to the work given in Stenography 400 and 401, the student makes copies of correctly written correspondence, legal forms, etc., also machine dictation. Much time is devoted to manifolding and filing.

Sophomore year; first semester; five credits; five laboratory periods.

403. ADVANCED STENOGRAPHY AND TYPEWRITING. A continuation of Advanced Stenography 402.

Sophomore year; second semester; five credits; five laboratory periods.

404. REPORTING AND OFFICE PRACTICE. Reports of lectures. The student is required to submit not less than twenty verbatim reports of lectures and addresses during the year. The reports must be properly transcribed and submitted to the teacher for approval.

Elective; senior year; first semester; three credits.

405. REPORTING AND OFFICE PRACTICE. In this course the student is required to spend a large share of his time in the courts and to render at least twenty verbatim reports, properly transcribed. A large amount of additional legal work will be required.

The finished work of the entire course must be passed on by the dean and the professor in charge.

Elective; senior year; second semester; three credits; three recitations.

PHARMACY

Professor McKellips

Mr. _____

The following courses are offered:

100. NOMENCLATURE. The Latin language is universally recognized as the language of science. The names of all plants and animals and of many natural objects in the material world are recorded in this language. These Latin names, in so far as they have connection with the profession of pharmacy, are made the subject of systematic study.

Sophomore year; first semester; three credits; three recitations.

101. NOMENCLATURE. This is a continuation of course 100.

Sophomore year; second semester; three credits; three recitations.

102. NOMENCLATURE. A continuation of course 101.

Elective; sophomore or junior years; first semester; three credits; three recitations.

103. NOMENCLATURE. A continuation of course 102.

Elective; sophomore or junior years; second semester; three credits; three recitations.

110. GENERAL PHARMACY. This course is a general introduction to the subject of pharmacy, given by means of series of lectures wherein the student is made familiar with the conditions which led to the origin of the practice of pharmacy as a profession separate and distinct from that of medicine. Attention is directed to the purposes of the profession, to the scientific principles underlying it, and to the proper means for comprehending these facts with a view to their intelligent application.

The drugs, chemicals, and prepared medicines of the U. S. Pharmacopoeia are made the subject of a series of recitations.

Junior year; first semester; three credits; three recitations.

111. GENERAL PHARMACY. A continuation of Pharmacy 110, to which is added the feature of laboratory practice. The student

takes up the various classes of pharmaceutical preparations and becomes familiar with the correct manner of their manufacture.

Experience has demonstrated the value of the laboratory as a factor in technical and scientific education. For this reason, the course in pharmacy as offered at this institution is one in which this feature is given unusual prominence.

From crude drugs, as barks, leaves, roots, and seeds, the student manufactures finished pharmaceuticals, such as tinctures, fluid extracts, elixirs, tablets, pills, etc.

Using the United States Pharmacopoeia as a laboratory manual, the student has the official requirements for purity and strength constantly before him, his attention thus being directed to these matters in a practical way.

Junior year; second semester; six credits; three recitations; three laboratory periods.

112. GENERAL PHARMACY. A continuation of course 111, in which the manufacture of the more difficult pharmaceuticals is taken up. Attention is given to the higher class of toilet preparations, as well as to galenicals.

Senior year; first semester; two credits; two laboratory periods.

113. GENERAL PHARMACY. A continuation of course 112.

Elective; senior year; second semester; two credits; two laboratory periods.

120. THERAPEUTICS AND DOSES. The definition of medical and therapeutical terms, the classification of medicines into groups according to their therapeutical action, and the consideration of the subject of dosage, are matters to which the attention of the student is directed at this time.

Junior year; first semester; three credits; three recitations.

130. PHARMACOGNOSY. This subject deals with the scientific classification of the plants and animals which furnish the crude drugs used in pharmacy. The relation existing between the various drugs is shown, and the student is thoroughly drilled in memorizing the classifications, and in learning from what parts of the world the drugs are obtained. He is instructed as to what particular portion of the plant or animal finds use in medicine and learns to recognize by some physical characteristic—appearance, odor, taste,

etc.—samples of all the important drugs. Extensive cabinets of sample drugs are kept for this purpose.

Junior year; first semester; three credits; three recitations.

131. PHARMACOGNOSY. This course is a continuation of course 130.

Junior year; second semester; three credits; three recitations.

140. MATERIA MEDICA AND TOXICOLOGY. As indicated by the name, this course is devoted to the study of "Medicinal Materials." All substances which find general use in medicine are here given attention. All are classified with respect to the action they have upon the human system. Crude drugs are grouped according to the plant constituents—alkaloids, glucosides, volatile oils, oleoresins, etc.—which they contain. Pharmaceutical preparations are studied with respect to composition and strength; chemicals according to solubility, medicinal activity, and incompatibility.

The student is drilled in the recognition of pharmaceutical preparations and of chemicals. The many common names, or synonyms, in use in connection with materia medica are memorized.

One hour a week is devoted to the consideration of Toxicology. The different classes of poisons—caustics, irritants, convulsants, paralyzants, narcotics, asphyxiants, etc.—are taken up and studied according to the characteristic symptoms they produce, the method of counteracting and preventing their harmful effects, and the antidote peculiar to each. This course is especially designed to meet the needs of the pharmacist. Provisions of the law regulating the sale of poisons within the State are explained in detail.

Senior year; first semester; three credits; three recitations.

141. MATERIA MEDICA AND TOXICOLOGY. This is a continuation of course 140.

Senior year; second semester; three credits; three recitations.

142. MATERIA MEDICA. A continuation of course 141. Advanced work for senior students who complete course 141 during their junior year.

Elective; senior year; first semester; three credits; three recitations.

143. MATERIA MEDICA. A continuation of course 142.

Elective; senior year; second semester; three credits; three recitations.

150. PRESCRIPTION PRACTICE. This work is sometimes spoken of as "extemporaneous pharmacy," and is justly regarded as the division of the profession belonging to the expert. The ability to compound, properly, intricate formulas at a moment's notice, is an art that can be acquired only by persistent study and painstaking practice. Opportunity for practice of this nature is here given. Prescriptions written by practicing physicians in various parts of the country have been collected. These afford the student practice in reading, itself often a matter of difficulty. Prescriptions presenting various types of incompatibility are compounded, as are others which afford experience in overcoming manipulative difficulties.

Senior year; first semester; three credits; three recitations.

151. PRESCRIPTION PRACTICE. A continuation of course 150.

Senior year; second semester; six credits; three recitations; three laboratory periods.

160. COMMERCIAL PHARMACY. In this course various problems arising in the physical management of the store are considered. The selection of proper types of fixtures, correct methods of stock arrangement, and harmonious effects in show-window dressing are topics receiving attention. Instruction in the art of sign card painting, including extensive practice with the air brush, is given. At various times during the year special lectures will be delivered by successful business men of the State.

Elective; senior year; first semester; three credits; one recitation; two laboratory periods.

161. A continuation of course 160.

Elective; senior year; second semester; three credits; one recitation; two laboratory periods.

INDUSTRIAL ARTS

Professor Ressler

Mr. _____

There is a steadily increasing demand in Oregon for competent teachers of manual training. These instructors teach in both the elementary and high school grades. In fact, the up-to-date school provides for manual or constructive work of various kinds from the first grade up. The well trained teacher must therefore understand both the technique and theory of his subject as adapted to the needs of pupils.

Below the fifth grade this manual instruction for both boys and girls is given by the regular grade teachers; but the supervisor and special teacher of manual training should be able to organize this work and correlate it with the other school subjects, and particularly with the later formal course in manual arts. For the boys, this will take the form of instruction in wood working, metals, machine shop, and in some schools, vocational training in the various trades. For the girls, it will lead to the study of the several phases of home economics.

A college degree course of the same general standard as the other B. S. courses is provided, in order that the young men who specialize in this field may receive a preparation that will place them on a par with the high school teachers in other branches. The relation of industrial instruction in the elementary and secondary schools to the industries of life, is more fundamental and direct than most of the other branches taught. It has its important relations also to higher education. It therefore becomes necessary to give these instructors a training that will make them more than masters of the mechanical processes.

The properly prepared teacher of industrial arts must have an appreciative understanding of the origin and development of the

industries, their relation to economic, social, and political life, and a profound conviction of the importance and dignity of their contribution to the progress of mankind. He should also have the broad sympathies of the cultured man, in order to enable him to set before his pupils high and worthy ideals of life. The artisan, artist, or professional man is first of all a man and a citizen, and our schools must make him aware of his high privileges and responsibilities.

(The various courses in Industrial Arts, offering the mechanical foundation for this work, are taught in the School of Engineering, and are listed under the department of Mechanical Engineering.)

INDUSTRIAL PEDAGOGY

Professor Ressler

Assistant Professor _____

Mr. _____

The department of Industrial Pedagogy offers courses in the preparation of teachers in the subjects of Agriculture, Home Economics, Commerce, and Manual Training. The importance of providing special instruction in the industries for the pupils of the public schools is fully recognized in this country. The material equipment in the way of laboratories, workshops, experimental fields, etc., is easily secured. Specially trained teachers cannot be prepared overnight. There is a real danger that the public will underestimate the scientific and educational significance of the new education. The industrial branches cannot be taught from textbooks nor by teachers without technical training.

There must also be special supervisors in each of the industrial branches for the larger schools, where instruction is given to a large number of pupils under both trained and untrained teachers. Supervisors who will do some regular teaching, are also required where a number of small town and country districts are grouped for industrial instruction. In time, we may expect the grade teachers to have secured through the high and normal schools the technical training that will enable them to teach the industrial branches under direction. Until that time, most of the teaching must be done by the special instructor.

More than four hundred school districts in Oregon are offering a year or more of high school instruction to about ten thousand pupils. The larger schools, employing six to forty high school teachers each, should require from two to twelve industrial teachers. There is also a field for the industrial teacher in the smaller high schools in connection with grade pupils or grouped with each other. Supervisors for groups of rural schools are also needed. It is estimated that two hundred and fifty industrial teachers could be used to advantage in our Oregon schools today.

The Department of Industrial Pedagogy gives the professional

training and advises with the students and deans of the various schools in the selection of the technical courses. In conjunction with the other departments concerned, tentative courses of study are prepared in each of the industrial branches, adapted to the age of the pupils and the social demands on the school. This department undertakes to assist teachers in the work of instruction, by general and special suggestions through college and other publications, and by correspondence and visitation where possible. Detailed lists of equipment and apparatus, with cost, suitable for small and large schools, will be furnished on request.

Students electing this course will be registered in the school in which their distinctive subject is given. Thus those who desire to prepare to teach and supervise Agriculture in the high school and grammar grades will be registered in the School of Agriculture and will receive their degrees in Agriculture on completion of the requirements.

In the same way students, desiring to prepare to teach Home Economics and Commerce will be registered in the schools of Home Economics and Commerce. A special degree course in Industrial Arts, described under that heading, has been organized for the preparation of teachers of Manual Training.

The following courses will be offered during 1913-14:

101. GENERAL PSYCHOLOGY. A study of general psychology by lectures, recitations, and reports; a description of the facts and laws of mental activities with applications to the ordinary affairs of life; demonstrations and experiments showing the relation of mental life to the nervous system; the significance of habit in conduct and character.

Junior year; first semester; three credits; three recitations.

102. EDUCATIONAL PSYCHOLOGY. The application of the facts and principles of psychology to teaching; a study of the growth of the child mind and the relations of the various periods to educational organization; adaptation of courses of instruction, methods of teaching, discipline, and general school activities to the stages of the pupil's development; lectures, recitations, reports, and simple investigations.

Senior year; first semester; two credits; two recitations.

120. HISTORY OF EDUCATION. A general review of the growth

and development of education and its relation to the civilization of the times; particular attention given to the rise of industrial education in Europe and America, and its place in the social and political life of the country.

Sophomore year; second semester; three credits; three recitations.

130. SCHOOL MANAGEMENT. A study of the organization of the school, including the relations and duties of pupils, teachers, supervisors, and school board. The place of the special teacher in the system; questions of discipline; practical exercises in making programs, keeping records, filling out reports, and performing other duties required by the Oregon School Law.

Sophomore year; first semester; three credits; three recitations.

140. GENERAL METHOD. The principles of teaching, including method of the recitation, preparation of lesson plans, and observations of model teaching; library references to periodicals and current literature relating to public school agriculture, domestic science and art, commerce, and manual training.

Junior year; second semester; three credits; three recitations.

150. SPECIAL METHOD IN AGRICULTURE. A careful, detailed study of the public school course in Agriculture, in its various relations, including the other subjects in the curriculum, preparation for college, farming, community life, etc. Model courses for both elementary and secondary grades are constructed, with plans for all desired equipment for laboratory, library, field work, including cost. Lesson plans on typical subjects, observation of model lessons, practice teaching, and extension work with school children and adults, provide additional opportunities to enable the student to reduce theory to practice.

Senior year; first semester; three credits; three recitations.

151. SPECIAL METHOD IN AGRICULTURE. Continuation of course 150.

Senior year; second semester; three credits; one recitation; two laboratory periods.

160. SPECIAL METHOD IN HOME ECONOMICS. Same as course 150 applied to the public school course in Domestic Science and Art.

Senior year; first semester; three credits; three recitations.

161. SPECIAL METHOD IN HOME ECONOMICS. Continuation of course 160, applied to Domestic Science.

Senior year; second semester; three credits; one recitation; two laboratory periods.

162. SPECIAL METHOD IN HOME ECONOMICS. Continuation of course 160, applied to Domestic Art.

Senior year; second semester; three credits; one recitation; two laboratory periods.

170. SPECIAL METHOD IN MANUAL TRAINING. Same as course 150, applied to the public school course in Manual Training.

Senior year; first semester; three credits; three recitations.

171. SPECIAL METHOD IN MANUAL TRAINING. Continuation of course 170.

Senior year; second semester; three credits; one recitation; two laboratory periods.

180. SPECIAL METHOD IN COMMERCE. Same as course 150, applied to the public school course in Commerce.

Senior year; first semester; three credits; three recitations.

181. SPECIAL METHOD IN COMMERCE. Continuation of course 180.

Senior year; second semester; three credits; one recitation; two laboratory periods.

190. SCHOOL ADMINISTRATION. A discussion and analysis of the American system of education, with an interpretation of the purpose and spirit of each division; problems of administration and teaching in the public schools; the correlation of the industrial branches with the other subjects in the curriculum. Lectures, reading, reports, and studies on the Oregon schools.

Electives for advanced or graduate students; second semester; two credits; two recitations.

191. SCHOOL HYGIENE. A course in the health provisions requisite for the hygienic conduct of education. This includes a discussion of ventilation, heating, light, seating, physical exercise in the school room and on the playground, games, medical inspection, tests for physical defects, disinfection, quarantine, and other similar topics. Oregon laws relating to these matters will be studied and the regulations of the State Board of Health and other State and local health authorities will be explained in detail.

Advanced investigations in other states will also be presented and comparative studies made. Lectures, reports, and first hand investigations on town and country school conditions, as far as practicable.

Elective for advanced or graduate students; first semester; two credits; two recitations.

192. CHILD STUDY. This includes the physical and mental characteristics of children and youth as contrasted with those of mature men and women. The relation of physical growth and development to the unfolding of mental powers; the instincts and their relation to the development of individuality, sense of responsibility to others, moral development, etc.; abnormalities; study and treatment of children as individuals and in class groups; and discussion of the social and economic implications as well as the psychological. Lectures, reports, and simple tests and records made by visitation of schools.

Elective for advanced or graduate students; second semester; two credits; two recitations.

200. RESEARCH. Advanced or graduate students who are qualified by previous training or experience may register for extended investigation of some specific problem in industrial education. The studies may be historical, either European or American; administrative; or in the field of method. General government and state reports; publications by special commissions; reports of committees of educational organizations; contributions by departments of colleges and universities; educational and other periodicals; and original investigations into Oregon conditions, compose the material to be used. These studies will be assigned and outlined by the instructor and stated reports made from time to time by the student. Regular hours will be assigned the individual students and credit given according to the amount of work done.

Elective for advanced or graduate students; first semester; two credits.

201. RESEARCH. Continuation of course 200.

Elective for advanced or graduate students; second semester; two credits.

202. RESEARCH. As outlined in course 200.

Elective for advanced or graduate students; first semester; four credits.

203. RESEARCH. Continuation of course 202.

Elective for advanced or graduate students; second semester; four credits.

ART AND ARCHITECTURE

Professor McLouth

Mr. Dobell

Miss _____

The first aim of the course in Drawing is to teach the student to see truly, to obtain quicker perceptions, and to develop keen observation, accurate judgment, and concentration of mind. Few among us see truly what we see, and then only what we have been educated to see. Besides the general quickening of perception and the training of the eye to accurate sight, drawing affords the means of noting the forms of objects, such as no written description can secure. It is a mode of expression second only to language itself.

In considering the study of drawing, its importance is too often lost sight of, and yet it may be safely said that drawing is a corner stone in the foundation of not only industrial education, but of scientific education as well. In engineering courses, for instance, a knowledge of drawing is one of the first requirements. Drawing is an invaluable element in general education as a handmaid to the other branches of study; and the foremost educators advocate the study of drawing as the first step in any system of industrial education.

The instruction offered in Architecture is planned with the view to train men to become draftsmen in established offices, or to carry on the practice of architecture immediately upon graduation. It is the aim of the course, that proper attention be given to develop the cultural side of the student. No profession calls for broader training than does that of an architect. Due attention is paid to construction and a consistent amount of time is devoted to the study of the various architectural styles with special attention to present day needs. Means of expression are arrived at by well-planned courses in freehand drawing, pen, pencil, and water color rendering.

It is with training for domestic or residence work, however, with which the department is especially concerned. The large percentage of work coming to an architect's office is in the nature of residences.

Until recently, the architecture of America has had marvelous growth in all lines save this one. Today, however, the attention of everyone is directed towards civic improvement, and no one thing adds more to the attractiveness of a city than the homes of taste which it possesses. The designing of country houses, long neglected, is also becoming a source of considerable income to the practicing architect. Much attention, then, in the course offered here, is given to the problem of planning the house.

ART

A. DRAWING. The purpose of this course is to teach the student to see correctly and to judge accurately, to give him enough general knowledge of drawing to make it an aid in the pursuance of other branches of study where graphic representation is an important feature of the work; and to give him such a training as will best and most fully meet the needs of the subsequent work.

The course consists of the principles of drawing, elementary perspective and its application, line drawing in charcoal and pencil from geometric forms, block casts, and simple still life. Much attention is given to proportion and accurate outline, because in laboratory drawing, such as in Botany and Zoology, true outline is of greatest importance.

The Secondary courses; in Agriculture, Commerce, and Forestry; first year; first semester; two credits; four studio periods.

B. MACHINE SKETCHING. This course is continued throughout the second semester, but is divided with the design to meet the requirements of the several Engineering courses. A considerable proportion of the time is given to machine sketching in order to acquaint the student with the method of securing and retaining data for complete working drawings by the aid of sketches; making and reading working drawings; detailing complicated parts, and making working drawings from written descriptions of machine parts.

The conventions of practice and the method of making clear, accurately dimensioned sketches for working drawings, is given first consideration. In machine sketching, the objects from which the sketches are made are selected from approved designs of commercial machinery and electrical apparatus, to give familiarity with correct forms. This work is carried on in the machine shops.

Prerequisite: Course A, or its equivalent.

The Secondary course in Mechanic Arts; first year; second semester; three credits; six drawing periods.

C. DRAWING. This course is designed for students in Agriculture, Forestry, and Commerce, further to carry out the aims of Course A; but instead of drawing from geometric forms and block casts, more complicated casts and still life studies are used. In this course, the Agricultural students are given instruction in making working drawings from approved farm machinery.

Prerequisite. Course A or its equivalent.

The Secondary course in Agriculture, Forestry, and Commerce; first year; second semester; two credits; four studio periods.

D. DRAWING. The exact definition of all forms is expressed in its contour or outline; the character of objects also may be expressed in line.

Elementary drawing in line from casts and still life.

Secondary course in Domestic Science and Art; second year; second semester; two credits; four studio periods.

101. FREEHAND LETTERING AND TITLE DESIGN. This course is especially designed for students in Civil Engineering, and consists of freehand lettering, the construction of Gothic letters and spacing, design of lines and titles, the single line titles, the choice of style, and size of letters, how to lay out and execute the design.

The course in Civil Engineering; freshman year; first semester; two credits; two studio periods.

102. ADVANCED ART. Drawing 102 and 103 are given to equip the students in the degree course in Domestic Science and Art with a strong foundation for the applied art work following, that they may be more able to carry out the subsequent courses intelligently and to greater advantage.

The work is in simple perspective applied to line drawing from casts and still life.

. The degree course in Domestic Science and Art; freshman year; first semester; two credits; four studio periods.

103. **LIGHT AND SHADE.** Drawing in light and shade from still life studies. Judging areas, character of surfaces, high lights and reflections, and the relative values of lights and shadows. The last six weeks of the semester are given to pencil drawing from plants. The foliage and flowers conventionalized and expressed in ink silhouettes, as suitable elements for use in design.

Prerequisite: Course 102.

The degree course in Domestic Science and Art; freshman year; second semester; two credits; four studio periods.

109. **ELEMENTARY DRAWING.** Drawing in charcoal from geometric and block casts and still life.

Pharmacy course; freshman year; first semester; two credits; four studio periods.

110. **ELEMENTARY DRAWING.** A continuation of Drawing 109.

Pharmacy course; freshman year; second semester; two credits; four studio periods.

204. **STILL LIFE IN COLOR.** Color plays a very important part in everyday life; not only in wearing apparel and home decoration but from the standpoint of nature appreciation. The study of color, working with color, greatly develops our ability to see and appreciate the wondrous beauty nature constantly presents to us.

Elementary color. Still life in colored chalk and pastel.

Prerequisites: Courses 102, 103.

Degree course in Domestic Science and Art; sophomore year; second semester; two credits; four studio periods.

305. **DESIGN.** In all of the courses in Domestic Art (Basketry, Millinery, Costume Design, etc.) and in the Industrial Arts, design is a very essential feature. The object of this course, then, is to place before the student a systematic study of the principles of design, continuing on to the more advanced work of applied design.

Prerequisites: Courses 102, 103, 104, 204 or their equivalent.

Elective in Domestic Art; junior year; first semester; two credits; two studio periods of two hours each.

306. **DESIGN AND STENCIL.** A continuation of course 305. Each student will design and execute patterns for application to curtains,

cushion covers, table runners, center pieces, and luncheon or tea sets. Cutting and applying stencils suitable for the materials (linen, crash, scrim, and art burlap) most available for home decoration.

Prerequisite: Course 305.

Elective in Domestic Art; junior year; second semester; two credits; two studio periods.

407. TRAINING COURSE FOR TEACHERS. Elective; first semester; three credits; one recitation; four studio periods.

408. TRAINING COURSE FOR TEACHERS. Both courses include talks on methods, the formulation of day by day lessons; their study and practice, following the best methods of public school drawing instruction.

Elective, second semester; three credits; one recitation; four studio periods.

409. ART APPRECIATION. Lectures, reading, and the study of prints and reproductions in color.

Elective in Domestic Art; senior year; first semester; two credits; two recitations.

410. ELEMENTARY DRAWING. A general knowledge of elementary drawing is necessary as a foundation for all the subsequent courses in Industrial Arts drawing. This course deals with the underlying principles of freehand drawing and the principles of freehand perspective, with their application to shop or working drawings; consists of line drawing in charcoal and pencil from the geometric forms, singly and in groups.

The course in Industrial Arts; first year; second semester; two credits; four studio periods.

411. INDUSTRIAL ARTS DRAWING. Working drawings in pencil from wood joints and machine parts; machine sketching and drawing from written descriptions.

Prerequisite: Course 410.

The course in Industrial Arts; second year; first semester; two credits; four studio periods.

412. INDUSTRIAL ARTS DESIGN. A course in the principles of design suited to the industrial arts, special attention being given to line and form.

Prerequisites: Courses 410, 411.

The course in Industrial Arts; second year; second semester; two credits; two studio periods of two hours each.

413. CLAY MODELLING. Modelling or designing in clay or any plastic material, is a practical art; because it is so closely related to Architecture and many of the applied arts, such as ceramics, art tile, and the terra cottas.

In this course the student will be made familiar with the use of the various tools, modelling from geometric forms, block casts of hands, feet, heads, etc.

An elective open to all students who have successfully completed two years of drawing; first semester; two credits; two studio periods of two hours each.

414. CLAY MODELLING. A continuation of course 413 with the addition of some original design executed in low relief.

An elective open to all students who have successfully completed Clay Modelling I, course 413; second semester; two credits; two studio periods of two hours each.

205. WATER COLOR. The course in Water Color is given the better to equip the student with means of expression in the applied and industrial arts courses, design, ceramics, etc.; also a cultural study for others who may elect it.

The work of the first semester will include simple flat washes from geometric casts and flat color washes from still life objects of broad area.

Prerequisites: Courses 102, 103, 204, or 410, 411, or their equivalent.

This course is open to all special art students after the required prerequisite courses in drawing, and as an elective to regular students who have completed two years of drawing; first semester; two credits; two studio periods of two hours each.

206. WATER COLOR. In this course the work will be in more complex flat washes and color schemes such as the application of color to design. Some still life will be taken up.

Prerequisites: Courses 102, 103, 204, 205, or 410, 411 and 204.

An elective open to all students who have completed two years of drawing and Water Color I, course 205; second semester; two credits; two studio periods of two hours each.

ARCHITECTURE

501. **ARCHITECTURAL DRAWING.** In this course the student is first introduced to strictly architectural work. It familiarizes him with the use of the T-square and triangle, the architect's scale and drawing instruments. Beginning with simple problems in direct projection, the course progresses to practical work drawings.

Much attention is given to lettering, neatness, and style. Twenty or more plates are prepared, and work is carried on in much the same manner as in an architect's office.

Freshman year; first semester; four credits; four drawing room periods.

502. **ORDERS.** A continuation of course 501, is in reality the first course in design. A thorough study of the proportions of the classic orders of architecture. Recitations will take up the study of the proportions of the various orders upon which the class will be closely quizzed, and there will be frequent talks on the historical development and meaning of the classic styles, and their relations to present day needs. Drawing room plates of the Orders on Whatman's paper will be made. One problem in original design will conclude the semester's work.

Prerequisites: Architecture 501, and Drawing A.

Freshman year; second semester; four credits; one recitation; three Drawing room periods.

503. **PEN AND PENCIL RENDERING.** The beginning course in the study of methods and means of architectural expression. The work is designed to give to the student the first insight into the handling of the pen and the pencil. Freehand sketches of still-life groups in the drawing room, followed by sketching of details of buildings on the campus; a study of the manners of portraying different building materials, such as brick, stone, terra cotta, stucco, etc.

Freshman year; first semester; two credits; two studio periods.

504. **PEN AND PENCIL RENDERING.** A continuation of course 503.

Freshman year; second semester; two credits; two studio periods.

505. **WATER COLOR RENDERING.** A collateral study with pen

and pencil rendering, training the student to handle the brush and color and to lay architectural washes.

Freshman year; first semester; one credit; two studio periods.

506. WATER COLOR RENDERING. A continuation of course 505.

Freshman year; second semester; one credit; two studio periods.

507. WOOD CONSTRUCTION. With Kidder's Building Construction, Part 2, Carpentry, as a text-book, a survey is made of the best methods of frame construction. The properties of woods with methods current in manufacturing, working and finishing them, and their constructive use in building are carefully studied, and a number of drawing room plates are prepared by each student, together with detailed freehand sketches from buildings in process of construction.

Sophomore year; first semester; four credits; one recitation; three drawing room periods.

508. METAL AND MASONRY. A continuation of the study of construction begun the preceeding semester. Kidder's Building Construction and Superintendence is used as text. All types of foundations—brick, stone, concrete and pile—are studied, with detailed inquiry into the use, defects, and qualities, modes of preparation, finish, and efficiency of each; the manufacture, design and use of terra cotta, and a complete study of modern steel and fire-proof construction.

The drawing room plates will consist of drawings of typical details of masonry and metal construction.

Sophomore year; second semester; four credits; one recitation; three studio periods.

509. SHADES AND SHADOWS. Approved methods of casting shadows for rendered drawings are studied in the drawing room.

Sophomore year; first semester; one credit; one drawing room period.

510. THE ELEMENTS OF DESIGN. A systematic study of the various elements which enter into design work. Problems in design worked out in the studio.

Sophomore year; first semester; three credits.

511. THE ELEMENTS OF DESIGN. Practical problems in design. It is the purpose of this course not to carry monumental design

work beyond the limit of practicality and no problems will be assigned which would not be met in an efficient architect's office.

Sophomore year; second semester; four credits.

512. EIGHT HOUR PROBLEMS. One Saturday in each month, a problem will be assigned to be worked out "en loge" by the student. This will partake somewhat of the nature of a competition.

Sophomore year; first semester; one credit; eight hours; "en loge."

513. EIGHT HOUR PROBLEMS. A continuation of course 512.

Sophomore year; second semester; one credit; eight hours; "en loge."

514. HISTORY OF ARCHITECTURE. With the aid of the stereopticon, the story of the rise, glory, and decline of the various styles of architecture is told. During the first semester the Egyptian, Assyrian, Greek, and Roman styles are studied. In the second semester's work the early Christian, Byzantine, Romanesque, Gothic, Renaissance, and Modern styles are studied. Contemporary work is closely noted in the study of the modern styles, since it is to meet the needs of a present generation that the student is trained.

Elective; first semester; four credits; four recitations.

515. HISTORY OF ARCHITECTURE. A continuation of course 514. Second semester; four credits; four recitations.

516. DOMESTIC PLANNING. The problem of the house is one upon which the architect is largely dependent for his practice. It seems very profitable to begin early in the course with a consideration of domestic planning and design.

The use, importance, placing, and relation of each room to the other parts of the house, the materials of construction and their effective use, the house and its site are all taken up in this study of domestic architecture.

Elective; three credits; three laboratory periods.

CHEMISTRY

Professor Fulton

Assistant Professor Tartar

Mr. Harding

Mr. Brodie

Mr. Daughters

Mr. Rowland

Miss Miller

Mr. _____

The beginner's courses, Chemistry 100, 101 and 102, consist essentially of the proof of some of the well known chemical laws, such as the law of conservation of matter, the law of definite proportions and of multiple proportions, the Law of Boyle, and the Law of Charles. The student attains skill in the manipulation of apparatus, and in the management of equipment in general. From this elementary work he proceeds to qualitative analysis, in the study of which he is taught to separate and identify the different elements composing the mass, and, in the case of metals, to learn of their properties, their use, the different methods of obtaining them from their ores, and the combinations in which they occur in nature.

If he has shown suitable proficiency, he advances to quantitative analysis, which is the determination of the amounts of the ingredients. He is taught both methods of analysis, volumetric, or the method by solution, and the gravimetric, or the method by precipitation and weighing. On completing these courses, the student is fairly well prepared to take up advanced chemistry, which treats of the analysis of soils, manures, cattle foods, dairy products, etc., or he can take up the subject from the inorganic side in the analysis of minerals, fuels, oils, gas, etc., or he can view it from the pharmacist's standpoint, in analyzing drugs.

Finally, as a graduate student, he may proceed intelligently along original lines of study and research.

The following courses are offered:

100. GENERAL CHEMISTRY. This course deals with the general principles of the science, and extends through the divisions known as the non-metals.

All degree courses except Domestic Science and Art; freshman year; first semester; four credits; two recitations; two laboratory periods.

101. GENERAL CHEMISTRY. Descriptive. A continuation of course 100.

All degree courses except Domestic Science and Art; freshman year; second semester; four credits; two recitations; two laboratory periods.

102. GENERAL CHEMISTRY. This course is arranged especially for the students of the Department of Domestic Science and Art.

The course in Domestic Science and Art; freshman year; first semester; four credits; two recitations; two laboratory periods.

103. GENERAL CHEMISTRY. A continuation of 102.

The course in Domestic Science and Art; freshman year; second semester; four credits; two recitations; two laboratory periods.

200. ELEMENTARY ORGANIC CHEMISTRY. This is a brief course in Organic Chemistry, and is provided for the students of Domestic Science and Art.

Sophomore year; first semester; four credits; two recitations; two laboratory periods.

201. ORGANIC CHEMISTRY. This course consists of the study of the more typical and simple organic compounds and is designed for Pharmacy, and such students of Agriculture as desire to take up Physiological Chemistry, and Veterinary Science.

Sophomore year; second semester; four credits; two recitations; two laboratory periods.

202. CHEMISTRY OF FOODS. An advanced course for the students of the School of Domestic Science and Art, consisting of practice in the best methods as applied in food analysis, and in detection of common adulterants. Opportunities for research work will be given if desired.

203. **TEXTILE CHEMISTRY.** This course is designed for the students in Domestic Art, and consists of the study of the fibres commonly known as the "textile fibres" and the action—chemical and physical—of the substances known as the "dyes" on the fibres.

Junior year; first semester; three credits; one recitation; two laboratory periods.

300. **QUALITATIVE ANALYSIS.** This course consists largely of laboratory practice in the ordinary processes of separating and identifying ions.

The course in Pharmacy and Highway Engineering; sophomore year; first semester; four credits; one recitation; three laboratory periods; junior year.

301. **QUALITATIVE ANALYSIS.** A course provided for mining students.

Sophomore year; first semester; five credits; one recitation; four laboratory periods.

400. **QUANTITATIVE ANALYSIS.** This is a course designed for students in Pharmacy, and consists of instruction in both gravimetric and volumetric analysis of pharmaceutical products.

Junior year; first semester; four credits; four laboratory periods.

401. **QUANTITATIVE ANALYSIS.** This is a course in analysis for Mining students, and consists of gravimetric analysis of limestones, iron, lead, zinc, arsenic and antimony ores, coal, and as much other work as time will permit.

The courses in Mining Engineering; sophomore year; second semester; five credits; five laboratory periods.

The course in Domestic Science and Art; sophomore year; second semester; four credits; one recitation; three laboratory periods.

403. **CHEMISTRY OF WATER.** This course is designed especially for the students in Civil Engineering, and consists of the examination, both physically and chemically, of waters for domestic purposes, such as well waters, but more particularly that supplied to cities, whether under municipal control or that of private corporations. At the close of the chemical examinations, bacteriological tests will be made under the auspices of the Department of Bacteriology.

The course in Civil Engineering; junior year; second semester; two credits; two laboratory periods.

Prerequisites: Chemistry 100 and 101.

404. PHARMACEUTICAL ANALYSIS. This is an extension of Quantitative Analysis 400, and consists of the chemical examination of alkaloidal drugs and galenicals, and of the examination of urine.

The course in Pharmacy; junior year; second semester; four credits; four laboratory periods.

405. CHEMISTRY OF HIGHWAY MATERIALS. This course is designed for students in Highway Engineering, and consists of the study of such materials as cement, asphalt, bitumen, mineral oils, tar, and tar products.

The course in Civil Engineering; junior year; second semester; two credits; two laboratory periods.

406. ELECTRO CHEMISTRY. This is a course for advanced Mining students, and consists of the application of the electric current to solutions of the different metals in metallurgical analysis.

Elective; junior or senior year; first semester; two credits; two laboratory periods.

407. CHEMISTRY FOR ENGINEERS. This course is particularly for students in Mechanical and Electrical Engineering. It consists of the analysis of coal, oil, gas, and of their calorific powers; also the technical analysis of flue gases.

Elective; junior or senior year; second semester; two credits; two laboratory periods.

409. PHYSIOLOGICAL CHEMISTRY. This course is primarily for students in Pharmacy but is open to any one interested in the subject.

Prerequisite: Chemistry 200.

Junior year; second semester; four credits; four laboratory periods.

410. CLINICAL CHEMISTRY.

Elective; senior year; first semester; three credits; one recitation; two laboratory periods.

413. TOXICO CHEMISTRY.

Elective; seniors; second semester; three credits; one recitation; two laboratory periods.

500. AGRICULTURAL CHEMISTRY. A course consisting of lectures, recitations, and laboratory work, dealing with the more important phases of Chemistry as related to Agriculture.

The course in Agriculture; sophomore year; first semester; four credits; two recitations; two laboratory periods.

501. AGRICULTURAL CHEMISTRY. A continuation of course 500.

The course in Agriculture; sophomore year; second semester; four credits; two recitations; two laboratory periods.

502. DAIRY CHEMISTRY. This consists of the study of the chemistry of milk and its products and includes both qualitative and quantitative determination of adulterants and preservatives.

Prerequisites: Chemistry 201 and 500.

The course in Dairy Husbandry; junior year; second semester; three credits; three laboratory periods.

503. SOIL CHEMISTRY. This is a lecture and laboratory course on the methods of soil analysis, as used by the different experiment stations.

Prerequisites: Chemistry 201 and 500.

Junior year; first semester; two or four credits; two or four laboratory periods.

504. SOIL CHEMISTRY. A continuation of course 503.

Junior year; second semester; two or four credits; two or four laboratory periods.

505. AGRICULTURAL ANALYSIS. A course in analytical methods applied to agricultural materials including cereals, fertilizers, soil, waters, etc.

Junior year; first semester; four credits; four laboratory periods.

Prerequisites: Chemistry 201 and 500.

506. AGRICULTURAL ANALYSIS. A continuation of course 505, extending through the second semester. Same credits and requirements.

507. ADVANCED AGRICULTURAL ANALYSIS. This course is especially Thesis work in the Experiment Station laboratory, or work of the same general description.

Senior year; first semester; four credits; four laboratory periods.

508. ADVANCED AGRICULTURAL ANALYSIS. A continuation of course 507.

Senior year; second semester; four credits; four laboratory periods.

600. INDUSTRIAL CHEMISTRY. A practical study of the chemical processes involved in the production of various commodities, including iron, steel, copper, and other metals; soaps, dyes, paints, and the like. The course is intended to familiarize the student with the application of chemistry to modern industries.

Elective; course in Commerce; junior or senior year; either semester; three credits; three recitations.

ENGLISH LANGUAGE AND LITERATURE

Professor Berchtold
Assistant Professor Callahan
Mr. Baldwin
Mrs. McElfresh
Mr. Peterson
Miss Vance
Miss Bowden
Miss Rosaaen

It is the aim of this department to teach the student to express with clearness what he thinks with vigor. He is taught that the essential part of any composition, whether oral or written, is thought, well-organized and well-expressed; that to comprehend clearly and to feel strongly what he has to say are the indispensable conditions of making others comprehend and feel it.

What his text-book helps him to do consciously, familiarity with superior writers should help him to do unconsciously; for we may get good from a master of English by unconscious absorption, just as we acquire good manners by associating with gentlemen and ladies. No mind can fail to be stimulated by contact with greater minds, whether living or dead. Their pages feed the powers of thought and strengthen the power of expression, thus enabling the student to think, talk, and write to more purpose.

In all the collegiate courses in English, particularly accentuated, however, in the courses in public speaking, the work is correlated with that offered in the other departments, to bring it into harmony with the trend or spirit of the institution, which is distinctly technical and industrial in character. Subjects are assigned for presentation and discussion which bear close relation to the work pursued by the students in the different schools, in

anticipation of their probable needs and activities in later life. What is sought and insisted on is, earnest, logical, forceful presentation of facts that will compel attention and carry conviction.

The Oregon Agricultural College participates in a number of intercollegiate oratorical contests and debates; and the courses in public speaking are designed to give preparation for these contests.

A—RHETORIC AND LITERATURE

A. ELEMENTARY CONSTRUCTIVE ENGLISH. This course is designed to make the expression of ideas a pleasure to the student. It is not confined to the mere memorizing of inflections and the formulation of rules. The course consists of both oral and written work, with Baskervill and Sewell's English Grammar as a basis. Written exercises prepared under rules of form are required constantly to obtain flexibility and confidence in expression. There is daily drill in punctuation and capitalization, in analysis and synthesis of sentences. Special emphasis is laid upon spelling. Practice in the correction of written work is given to enable the student to detect his own mistakes readily. Elementary themes, one, two, and three paragraphs in length are required, the subjects being chosen from the student's experience, and from classic readings. Ten short themes, with conferences for criticism, will be required.

The Secondary courses; first year; first semester; four credits; four recitations.

B. COMPOSITION. The aim of this course is to ground students thoroughly in the elements and fundamentals of composition. Capitalization and punctuation reviewed; the importance of letter writing emphasized; principles governing sentence structure, paragraph structure, and theme structure, studied, with certain classic models always in the foreground; the aim is, in short, to develop power of expression and individuality as spontaneously and naturally as possible. Further, the logical arrangement of thoughts as represented by the outline, receives special emphasis. At least eight short themes, six long themes, synopses, and one resume, with conferences for criticism, to illustrate the forms of

composition. To be taken in connection with English D, and supplemented by it.

The Secondary courses; first year; second semester; two credits; two recitations.

C. ELEMENTS OF LITERATURE. The aim of this elementary course is to cultivate in the student a taste for reading; to assist him in the interpretation of the simpler classics of our literature; and to encourage him to express his own thoughts clearly and without embarrassment. Masterpieces of prose and poetry are studied, and some collateral reading is required. Oral and written reports on current events as outlined in the Literary Digest, The Atlantic Monthly, and other standard magazines.

The Secondary courses; first year; first semester; one credit; one recitation.

"The Odyssey," Lang's Translation.

"Snowbound," Whittier.

D. ELEMENTS OF LITERATURE. A continuation of Elements of Literature C.

The Secondary courses; first year; second semester; three credits; three recitations.

"The Iliad," Lang's Translation.

"The Pilgrim's Progress," Part I, Bunyan.

"The Merchant of Venice," Shakespeare.

"The Vision of Sir Launfal," Lowell, or "The Ancient Mariner," Coleridge.

E. RHETORIC AND COMPOSITION. Open to students who have had courses A, B, C, D, or their equivalent.

A review of the principles of grammar; exercises in syntactical construction; principles governing the structure of the whole composition; analysis and outline of specimens of easy classic prose and poetry, with a view to illustrating theme structure; writing of short compositions in class on "read up" matter; and the preparation of twelve short themes and two long themes, in the narrative and descriptive forms, with attention to sentence structure, spelling, punctuation, and paragraph arrangement.

The Secondary courses; second year; first semester; three credits; three recitations.

F. RHETORIC AND COMPOSITION. A continuation of course E. Intensive study of the Paragraph, the Sentence, and the Word; study of synonyms; paragraph writing, with a view to applying the principles governing the development of the topic statement; at least ten short themes, occurring weekly, and three long themes, in the expository and argumentative forms.

The Secondary courses; second year; second semester; three credits; three recitations.

G. ELEMENTS OF LITERATURE. Principles of literary criticism; interpretative study of classics; analysis and rendering. George Eliot's "Silas Marner," Irving's "Tales of a Traveller," Parkman's "Montcalm and Wolfe" or Dickens' "Tale of Two Cities", constitute the list of classics from which selections for study will be made.

The Secondary courses; second year; first semester; two credits; two recitations.

H. ELEMENTS OF LITERATURE. Continuation of the methods of work employed in the first semester. A selection of two classics will be made for study from a list consisting of Shakespeare's "As You Like It," Mary Johnston's "The Long Roll," Hawthorne's "The House of Seven Gables."

The Secondary courses; second year; second semester; two credits; two recitations.

21. BUSINESS ENGLISH. Besides giving a thorough training in commercial correspondence, the course aims to ground the students in the vocabulary, forms, and usages peculiar to business and administrative pursuits. Incidental writing, summaries, advertising, preparation of copy, and proofreading receive much attention.

The standards of commercial English are each year advancing, and familiarity with proper usage of recognized form is of paramount importance to those who are looking forward to a business career.

The course in Commerce; freshman and second Secondary years; first and second semesters respectively. The course in Forestry; freshman year; second semester. Three credits; three recitations; either semester.

31. **RHETORIC.** Study of the elements and principles involved in effective discourse. Study of the expository and argumentative methods of writing, with analysis of selections. Drafting of expository outlines, with special attention given to correct coordination and subordination. A study of the paragraph as the form of expository composition, accompanied by practice-writing for showing the various methods of developing the topic statement. Instruction and drill in compiling and composing notes, an elementary exercise in original research. Plotting of briefs.

Compositions required: Eight expository and four argumentative short themes. One expository long theme requiring research, and accompanied by bibliography; one criticism; two argumentative long themes, accompanied by briefs.

All degree courses; freshman year; first semester; three credits; three recitations.

32. **ADVANCED RHETORIC.** Study of the elements and principles involved in effective discourse continued, lectures, discussions and outlines on the characteristics of the literature of feeling, accompanied by readings to illustrate the type. Study of the descriptive and narrative methods of writing, with illustrative readings. Expository and emotional description differentiated. Function of description in narrative writing. Outlines exhibiting and briefly defining narrative types. Practice in writing dialogue.

Compositions required: Eight short descriptive themes; four short narrative themes; two long narrative themes; one long theme retelling, in abstract, the story of a book of fiction. Frequent oral delivery.

All degree courses; freshman year; second semester; three credits; three recitations.

41. **ELEMENTS OF LITERATURE.** Instruction in the elements of literature will aim to give the student an intimate acquaintance with typical specimens of excellent literary productions composed in the English language, and help him to discover whatever is of significance in a piece of literature, and to explain it intelligently in terms of rhetoric. Specimens for critical examination will be chosen from the works of authors that have become classic, and from the productions of the best contemporary writers. The

prevailing type studied during the first semester will be the literature of thought. The work will be so conducted as continually to correlate with the work in rhetoric and composition. Analysis and rendering. Topics assigned for reading, and for oral and written reports.

All degree courses; freshman year; second semester; two credits; two recitations.

42. ELEMENTS OF LITERATURE. The work in the elements of literature, during the second semester, is, as regards aims, sources of specimens, and methods of study, essentially the same as that of the first semester. The prevailing type studied is the literature of feeling. Topics assigned for reading and oral and written reports.

All degree courses; freshman year; second semester; two credits; two recitations.

51. THE ESSAY. This is perhaps the most instructive, helpful and profitable of the forms of discourse. A careful study of the works of the masters of this form: Emerson, Lowell, Stedman, DeQuincey, Macaulay, Matthew Arnold, Ruskin, Pater, Stevenson. Study of the paragraph; frequent written exercises, to acquire correctness and facility of expression.

Required in the course in Domestic Science and Art; sophomore year; first semester; three credits; three recitations.

52. THE ENGLISH DRAMA. A course devoted chiefly to the study of Shakespeare. Rapid survey of the rise and development of the English drama, by lectures and reports, followed by the careful reading of three or four of Shakespeare's plays. Study of setting, plot, structure, and characters. Reports on assigned readings. Reviews.

The course in Domestic Science and Art; sophomore year; second semester; three credits; three recitations.

61. ENGLISH LITERATURE. A general outline course of the history of English literature. This includes a survey of the principal forms of literature as exemplified by the masters in each field. The aim is to cultivate an appreciation of what is excellent in quality and form. Masterpieces representing the best thought and form are studied in class or assigned to students for

careful reading and reports. Chief attention given to Chaucer, Spenser, Shakespeare, Milton, Swift, Pope, Johnson, Burke, Goldsmith, and Burns.

The course in Domestic Science and Art; junior year; first semester; three credits; three recitations.

62. ENGLISH LITERATURE. A continuation of course 61. A study of the writers of the nineteenth century: Wordsworth, Scott, Shelley, Keats, Macaulay, Dickens, Thackeray, George Eliot, Matthew Arnold, Carlyle, Ruskin, Stevenson, and others. The required readings are designed to illustrate the different forms and periods of English literature.

The course in Domestic Science and Art; junior year; second semester; three credits; three recitations.

71. AMERICAN LITERATURE. A study of the leading periods and principal writers of our country, with particular emphasis on what is sometimes called the First National Period, including such authors as Irving, Cooper, Bryant, Poe, Hawthorne, Longfellow, Lowell, and Holmes; also prominent writers of the present day; lectures; class room study and reading; compositions.

The courses in Domestic Science and Art, and Pharmacy; elective in the other courses; senior year; first semester; two credits; two recitations.

72. AMERICAN LITERATURE. A continuation of course 71. The metropolitan writers; present schools and tendencies; literature in the West; lectures; class room study and reading; compositions.

The courses in Domestic Science and Art, and Pharmacy; elective in the other courses; senior year; second semester; two credits; two recitations.

81. MODERN ENGLISH PROSE. A study of representative modern prose writers with special reference to prose as found in present day standard periodicals. Study of the newspaper paragraph. Practice in reporting lectures. Exercises in the elaboration of field notes. Drills looking to the popularization of technical matters and the results of experiments. Writing of papers and reports. Theme writing. Oral composition.

Elective in the courses in Agriculture, Forestry, Commerce, Mechanical and Civil Engineering; sophomore year; first semester; three credits; three recitations.

82. MODERN ENGLISH PROSE. A continuation of course 81.

Elective in the courses in Agriculture, Forestry, Commerce, Mechanical and Civil Engineering; sophomore year; second semester; three credits; three recitations.

B—PUBLIC SPEAKING

101. ARGUMENTATIVE THEMES. This course is devoted principally to training in analysis, evidence, and brief-drawing. The work consists of lectures, a study of text-books, and practice in the composition of various forms of argumentative themes.

All courses in Engineering and Pharmacy; sophomore year; first semester; one credit; one recitation.

In the courses in Agriculture, Commerce, and Forestry; junior year; first semester; one credit; one recitation.

102. PRESENTATION. This course deals with the principles of conviction and persuasion, and with the problems of presentation. Students are taught how to recognize and solve problems which arise because of the different interests and characters of individuals and communities.

All courses in Engineering and Pharmacy; sophomore year; second semester; one credit; one recitation.

In courses in Agriculture, Commerce, and Forestry; junior year; second semester; one credit; one recitation.

103. COMPOSITION OF ADDRESSES. This course deals with the composition of the most important kinds of addresses, including the argument, the eulogy, the commemorative address, and various forms of non-forensics. The work consists of lectures, a study of text-books, analysis of masterpieces, practice in the composition of the various forms, and frequent class room exercises.

All Engineering courses; junior year; first semester; two credits; two recitations.

The courses in Agriculture, Commerce, Forestry, and Pharmacy; senior year; first semester; two credits; two recitations.

104. EXTEMPORE SPEAKING. Practice in the presentation of the various forms of addresses. Speeches are prepared on topics of special interest to the students and delivered with the view

to making them most effective as means in the advancement of a particular cause. Extensive criticism is offered as to methods of selection, organization and presentation.

All Engineering courses; junior year; second semester; two credits; two recitations.

The courses in Agriculture, Commerce, and Pharmacy; senior year; second semester; two credits; two recitations.

105. PRACTICAL PUBLIC SPEAKING. Practice in the presentation of the various forms of public addresses, voice training, study of gesture, bearing, and the elements of ease, grace, and force in presentation. Practice in the rapid preparation and in the impromptu delivery of speeches on topics of current interest. Designed for those who wish some general training in public speaking. Drill in parliamentary procedure.

Elective; first semester; three credits; three recitations.

106. PRACTICAL PUBLIC SPEAKING. Continuation of course 105.

Elective; second semester; three credits; three recitations.

107. DEBATING. Practical work in brief-drawing, the collection and handling of evidence, and debating. Each student will prepare several debates under the direction of the instructor; construct briefs and participate in class room debates. Personal consultation with the instructor on thought, composition and delivery. This course is a critical and practical study of debating. The class is limited in number, and the course can be taken only with the consent of the instructor.

Elective; first semester; two credits; two recitations.

108. ORATORY. This course is intended as special preparation for those who wish to enter oratorical work. The work consists of lectures on the theory of oratory, the preparation of original orations, class room exercises, and personal conferences and criticism. The course can be taken only with the consent of the instructor.

Elective; first semester; one credit; one recitation.

109. ELEMENTARY PUBLIC SPEAKING. By studying the principles of conviction and persuasion, and by practicing daily the presentation of impromptu as well as carefully prepared speeches, the students are given in this course a training along those lines

of public speaking which will be the most practical and useful to them after leaving the College. Practice in parliamentary procedure will also be given.

The course in Domestic Science and Art; first or second semester of the freshman year; two credits; two recitations.

110. **APPLIED PUBLIC SPEAKING.** This is a companion course to courses 105 and 106. It is intended for those who want a practical course in Public Speaking as applied in salesmanship, in speeches on technical subjects, etc. Like the other courses (105 and 106) it offers practice in the presentation of various types of addresses, the purpose of which is to acquire ease, grace, clearness, persuasiveness, and force in speaking. Drill in parliamentary practice.

Elective; first semester; two credits; two recitations.

111. **APPLIED PUBLIC SPEAKING.** Continuation of course 110.

Elective; second semester; two credits; two recitations.

201. **ELOCUTION.** Literary interpretation, including analysis, memorizing, and rendering of selected masterpieces of prose and poetry. The aim of this course is to enable the student not only to understand and appreciate the thought and spirit of literature, but to render it naturally and effectively; to correct erroneous habits of speech and to give freedom, purity, and strength of tone; to cultivate the power of expression through imagination; to eliminate artificiality, affectation, and self-consciousness.

Elective; first semester; two credits; two recitations.

202. **ELOCUTION.** Continuation of course 201.

Elective; second semester; two credits; two recitations.

203. **ELOCUTION.** Advanced literary interpretation. Training in the delivery of masterpieces of prose and poetry; repertoire; Bible reading; interpretative study of Shakespeare and the modern drama; voice culture; bodily expression; impersonation.

Prerequisite: Course 108.

Elective; first semester; two credits; two recitations.

204. **ELOCUTION.** Continuation of course 203.

Elective; second semester; two credits; two recitations.

301. **AMERICAN JOURNALS.** Lectures dealing with the history and development of American newspapers, scientific and industrial

journals; their use, and influence on the political and scientific activities of the times; law of libel and copyright. Class room examination of newspapers, industrial, scientific and critical periodicals. Practical work in writing for journals of the various classes.

Elective; first semester; three credits; three recitations.

302. INDUSTRIAL JOURNALISM. Continuation of course 301. Practice in preparation of articles for newspapers, scientific and industrial periodicals. Preparation of scientific bulletins. Writing of political letters and pamphlets. Critical examination of specimens of journalistic production in the fields of politics and science, supplemented by lectures.

Elective; second semester; three credits; three recitations.

303. THE SCIENCE OF EDITING. Practice in the reading of proof and the remodeling of material prepared for the press. In this course, the students will work under the direction of the instructor in the preparation of the undergraduate publications and, to some extent, the College publications.

Elective; first semester; two credits; two recitations.

304. ADVERTISING. Lectures on the psychology of successful advertising. Study of the principles of composition in the various forms of advertising. Preparation and distribution. Lectures supplemented by critical examination of advertising in American journals. Practice in the preparation of advertising matter.

Elective; second semester; two credits; two recitations.

Note.—Courses 301, 302, 303, 304, may not be offered during 1913-14.

HISTORY

Professor Horner.

A. ANCIENT HISTORY. A survey of the ancient eastern nations with a careful study of Greece and Rome.

The Secondary courses; first year; first semester; three credits; three recitations.

B. MEDIAEVAL AND MODERN HISTORY. A study of the social and political institutions of Europe, with discussions touching the material progress of these ages; famous works of art; foundations, inventions, discoveries, enterprises, improvements, and investigations.

The Secondary courses; first year; second semester; three credits; three recitations.

10. ENGLISH HISTORY. An outline of political and constitutional history to serve as a framework for the study of the economic, social, and intellectual development of the nation.

Required of freshmen in Domestic Science and Art.

Elective; first semester; three credits; three recitations.

20. UNITED STATES HISTORY. With special attention to the colonial, political, and industrial aspects.

The secondary course in Forestry; second year; first semester; three credits; three recitations.

30. EUROPEAN HISTORY (ADVANCED COURSE). The period studied under this title extends from the Renaissance to the close of the French Revolution. The beginnings and growth of modern European states are considered, together with the great art, intellectual, religious, and political movements which have prevailed in Europe. The modern expansion activities of these states upon other continents are also discussed.

Prerequisite: History B.

The course in Commerce; sophomore year; second semester; three credits; three recitations.

40. MODERN EUROPE. The development of modern Europe since the Congress of Vienna.

Prerequisite: History B.

Elective; three credits; three recitations.

50. CONSTITUTIONAL HISTORY OF ENGLAND. Development of the English Government; the Magna Charta; its origin; its meaning; its bearing upon English legislation and law. Bill of Rights; Petition of Rights; and other important political documents; American Constitution, the outgrowth of English Polity. Adapted especially to students expecting to study law.

Elective; senior year; second semester; three credits; three recitations.

60. POLITICAL AND CONSTITUTIONAL HISTORY OF THE UNITED STATES. A brief course that covers the important events of our history. It is offered to students who have not had time to take thorough courses in United States History and Political Science. Especially important in Oregon since the introduction of direct legislation, and equal suffrage.

In order to accomplish as much as possible in the brief time allotted to the subject, the student uses a combination of two text-books; namely, Channing's "United States History," and Ashley's "American Government." Instruction by recitation and discussion. Adapted to all schools except the Schools of Commerce and Domestic Science and Art, which cover the course with other work.

Elective; two credits; two recitations.

70. HISTORY OF OREGON. Early explorations. Lewis and Clark expedition. Minor expeditions. Fur trade. Rivalry between companies. Era of immigration. Oregon organized under Hudson Bay Company. Agitation in Congress for military occupation of the Columbia. The Nez Perce Indians ask for the Bible. Response by Methodists and Congregationalists. Doctor Whitman and the Oregon movement. Struggle for the Willamette. Struggle for the Columbia. First transcontinental wagon road. Provisional government. Progress of immigration and missons. Gold excitement. Subdivision of Oregon into territories. Indian wars. Home building. Disposition made of the Indians. Oregon becomes a

State. Introduction of improved fruit, grains, and stock. Ships and railways. Select schools, public schools, and higher education. Oregon literature. Industrial training, and introduction of scientific methods. Irrigation; conservation of forests. "The Oregon System" of direct legislation.

Elective; the course in Commerce; sophomore year; first semester; the course in Domestic Science and Art; junior year; second semester; three credits; three recitations.

LIBRARY

Mrs. Kidder
Miss Lewis*
Miss Haight
Miss Herse

EQUIPMENT. The Library occupies the second floor of the Administration Building. The reading and general reference room is large, well lighted, and extends entirely across the building. It is supplied with about five hundred leading magazines and newspapers. Through the courtesy of the editors, a large number of farm, orchard, stock, and home journals, and county newspapers of Oregon are received regularly at the reading room. The book stacks, occupying adjacent rooms, contain about sixteen thousand volumes of standard works of history, biography, engineering, agriculture, natural science, general literature and reference, and about five thousand reports and other publications from the Agricultural Colleges and Experiment Stations of all the states, and thirty thousand bulletins and pamphlets. The library is a designated depository of United States Government publications, of which it has about seven thousand volumes. Over two thousand of these were received as a gift from the library of the late United States Senator Dolph.

Practical use of the books has led to the establishment of small reference libraries kept in the rooms of the following departments: General Chemistry, Agricultural Chemistry, Animal Husbandry, Agronomy, Horticulture, Botany, Forestry, Bacteriology, Zoology, Pharmacy, Civil, Mechanical, Electrical, and Mining Engineering. Each department library is in charge of the head of that department, to whom application must be made for the use of the books.

All books are classified and catalogued according to the Dewey decimal system. Books may be drawn for home use by all officers

*On leave of absence.

and students of the College. Books may be kept by the students for two weeks with the privilege of a renewal and by officers for any reasonable time. All students have free access to the shelves of the reference library in the reading room, but apply at the delivery desk for other works which they may desire.

The reference library consists of encyclopedias, dictionaries, standard reference books in the different departments of study, and bound periodicals, together with books designated by professors for collateral reading in the various courses of instruction. A small collection of books for cultural reading is also kept in the reading room. In the same room, and accessible to all readers, is the card catalogue of the general library, including the books of the department libraries. The catalogue includes both authors and subjects under one alphabet on the dictionary plan; there is also a card catalogue of the publications of the U. S. Dept. of Agriculture, and a card index to the publications of the State Experiment Stations.

1. **LIBRARY PRACTICE.** This course teaches, by means of lectures and practical problems, the use of catalogues, indexes, and reference books, such as dictionaries, encyclopedias, atlases, handbooks of general information, handbooks of history, statistics, quotations, etc.

All degree courses; freshman year; first semester; one credit; one recitation.

MATHEMATICS

Professor Johnson
Assistant Professor Tartar
Mr. Beard
Mr. Beaty
Miss Campbell

A. ALGEBRA. The work of the course includes a drill in the fundamental operations, use of parentheses, special rules of multiplication and division, factoring, highest common factor, lowest common multiple, and fractions.

The Secondary courses; first year; first semester; five credits; five recitations.

B. ALGEBRA. The topics studied are solution of fractional and literal equations, problems involving linear equations, simultaneous linear equations involving two or more unknown numbers, problems involving simultaneous linear equations, graphical representation, inequalities, involution, evolution, theory of exponents, radical expression, and imaginary numbers.

The Secondary courses; first year; second semester; five credits; five recitations.

C. ALGEBRA. After a short review of the topics which precede quadratic equations, the following subjects are carefully treated: quadratic equations, problems involving quadratic equations with one unknown number, equations in the quadratic form, theory of quadratic equations, factoring of quadratic expressions, solution of quadratic equations by factoring, graphical representation of quadratic expressions with one unknown number, simultaneous quadratic equations, problems involving simultaneous quadratic equations with two unknown numbers, and graphical representation of simultaneous quadratic equations.

The Secondary courses; second year; first semester; two and one-half credits; alternates with course D.

D. PLANE GEOMETRY. Course D includes the first two books of Plane Geometry. The constant aim is to develop in the student the power of logical reasoning, and of clearness and accuracy of expression. To this end, many original exercises are studied, and at all times demonstrations and proofs are freely discussed in the classroom.

The Secondary courses; second year; first semester; two and one-half credits; alternates with course C. Required of freshmen entering deficient in first semester of Plane Geometry.

E. PLANE AND SOLID GEOMETRY. This course is a continuation of course D and is arranged for students in Mechanic Arts, and for freshmen in Engineering who enter deficient in the second semester of Plane Geometry.

The Secondary course in Mechanic Arts; second year; second semester; five credits; five recitations.

F. SOLID GEOMETRY. Required of all Engineering freshmen who are deficient in Solid Geometry.

Freshman year; first semester; two credits; two recitations.

G. PLANE GEOMETRY. Courses G and H are arranged for freshmen who enter deficient in the second semester of Plane Geometry and who desire to use both semesters to make up the condition. The two courses are equivalent to course K.

Freshman year; first semester; two and one-half credits; two and one-half recitations.

H. PLANE GEOMETRY. This is a continuation of course G.

Freshman year; second semester; two and one-half credits; two and one-half recitations.

K. PLANE GEOMETRY. The last three books of Plane Geometry. All Secondary courses except Mechanic Arts; second year; second semester; five credits; five recitations.

A continuation of course D; required of freshmen, except those in Engineering, who enter deficient in second semester of Plane Geometry.

11. PLANE TRIGONOMETRY. This course includes functions of acute angles, right triangles, functions of any angle, relations

between functions, inverse functions, trigonometric equations, and oblique triangles. Considerable time is devoted to the deduction of trigonometric formulæ, study of trigonometric identities and the solution of practical problems.

All Engineering courses; freshman year; first three-fifths first semester; three credits; five recitations.

12. PLANE TRIGONOMETRY. The course in Commerce; second semester; three credits; three recitations.

15. SPHERICAL TRIGONOMETRY. The course in Civil Engineering; freshman year; last half of first semester; one credit; two recitations.

21. COLLEGE ALGEBRA. After a brief review of radical expressions, theory of indices, and quadratic equations, graphical representation and mathematical induction are studied.

All Engineering courses; freshman year; last two-fifths of first semester; two credits; five recitations.

31. ELEMENTARY ANALYSIS. Under College Algebra are treated the binominal theorem, progressions, complex numbers, and the theory of equations. In analytical geometry the point, straight line, circle, conic sections, and some of the higher plane curves are studied. Considerable time is given to the plotting of curves in both rectangular and polar co-ordinates.

All Engineering courses; freshman year; second semester; five credits; five recitations.

41. PLANE ANALYTIC GEOMETRY. Course 41 is offered to students who enter the sophomore year deficient in Analytic Geometry. The topics studied are the point, the straight line, polar co-ordinates, transformation of co-ordinates, the circle, conic sections, tangents, diameter, poles and polars, discussions of general equations of the second degree, problems in loci, and higher plane curves.

All Engineering courses; sophomore year; first semester; three credits; three recitations.

51. DIFFERENTIAL CALCULUS. Among the subjects presented are: Differentiation and applications, evaluation of indeterminate forms, expansion of functions, Taylor's and Maclaurin's theorems, maxima and minima, points of inflection, curvature, change of

independent variable, functions of two or more variables, asymptotes, curve tracing, etc.

All Engineering courses; sophomore year; first semester; five credits; five recitations.

52. INTEGRAL CALCULUS. Among the topics considered are Direct integration, definite integrals and applications; integration by parts, integration of trigonometric forms, etc.; applications to finding the lengths and areas of curves, surfaces, and volumes of solids of revolution, etc.; double and triple integration and applications. In this course, as in Course 51, great stress is laid upon practical applications, and a large number of practical problems are solved.

All Engineering courses; sophomore year; second semester; five credits; five recitations.

61. DIFFERENTIAL EQUATIONS. A study of the solution of ordinary and partial differential equations which the Engineering student is likely to encounter.

Prerequisites: Courses 51, 52.

Elective; junior year; first semester; three credits; three recitations.

71. METHOD OF LEAST SQUARES. Prerequisites: Courses 51, 52

Elective; junior year; second semester; two credits; two recitations.

MODERN LANGUAGES

Professor Bach

Miss Kuney

Miss _____

Courses of three years are offered in French, German, and Spanish respectively.

The end in view is practical use for the various pursuits of life. Consequently the method of teaching is thoroughly practical, combining all the theory necessary with all the practice possible.

FRENCH

101. FRENCH. Grammar; oral and written exercises; some of the irregular verbs in general use; reading of 100 to 150 pages of easy prose.

Sophomore year; first semester; three credits; three recitations.

102. FRENCH. A continuation of course 101.

Prerequisite: Course 101.

Sophomore year; second semester; three credits; three recitations.

103. FRENCH. Grammar continued; irregular verbs; reading of intermediate texts; oral and written exercises.

Prerequisites: Courses 101 and 102.

Junior year; first semester; three credits; three recitations.

104. FRENCH. A continuation of course 103.

Prerequisites: Courses 101, 102, 103.

Junior year; second semester; three credits; three recitations.

In addition to the regular second year's work, a special elective conversational course is offered for all students who have completed the first year's work. (See course 109.)

105. FRENCH. Science course. Reading of selections from French scientific literature.

Prerequisites: Courses 101, 102, 103, 104.

Elective; senior year; first semester; two credits; two recitations.

106. FRENCH. A continuation of course 105.

Prerequisites: Courses 101, 102, 103, 104, 105.

Elective; senior year; second semester; two credits; two recitations.

107. FRENCH. Literature course. Reading of standard selections from French general literature.

Prerequisites: Courses 101, 102, 103, 104.

Elective; senior year; first semester; two credits; two recitations.

108. FRENCH. A continuation of course 107.

Prerequisites: Courses 101, 102, 103, 104, 107.

Elective; senior year; second semester; two credits; two recitations.

109. FRENCH. A conversational course. Provides interesting and profitable conversational drill on practical every-day topics and includes, in a new form, a helpful review of the elements of the language.

Prerequisites: Courses 101, 102.

Elective; junior year; first semester; one credit; one recitation.

110. FRENCH. A continuation of course 109.

Prerequisites: Courses 101, 102, 109.

Elective; junior year; second semester; one credit; one recitation.

111. FRENCH. Conversational course. Provides well graded and systematically planned talks on all sorts of topics.

Prerequisites: Courses 101, 102, 103, 104.

Elective; senior year; first semester; one credit; one recitation.

112. FRENCH. A continuation of course 111.

Prerequisites: Courses 101, 102, 103, 104, 111.

Elective; senior year; second semester; one credit; one recitation.

GERMAN

201. GERMAN. Grammar; elementary forms with oral and written exercises; reading of 100-150 pages of easy prose.

Sophomore year; first semester; three credits; three recitations.

202. GERMAN. A continuation of course 201.

Prerequisite: Course 201.

Sophomore year; second semester; three credits; three recitations.

203. GERMAN. Grammar continued; reading of intermediate texts, oral and written exercises.

Prerequisites: Courses 201, 202.

Junior year; first semester; three credits; three recitations.

204. GERMAN. A continuation of course 203.

Prerequisites: Courses 201, 202, 203.

Junior year; second semester; three credits; three recitations.

In addition to the regular second year's work, a special elective conversational course is offered for all students who have completed the first year's work. (See Course 211.)

205. GERMAN. Science course. Reading of selections from German scientific texts.

Prerequisites: Courses 201, 202, 203, 204.

Elective; senior year; first semester; two credits; two recitations.

206. GERMAN. A continuation of course 205.

Prerequisites: Courses 201, 202, 203, 204, 205.

Elective; senior year; second semester; two credits; two recitations.

207. GERMAN. Literature course. Reading of standard selections from German literature.

Prerequisites: Courses 201, 202, 203, 204.

Elective; senior year; first semester; two credits; two recitations.

208. GERMAN. A continuation of course 207.

Prerequisites: Courses 201, 202, 203, 204, 207.

Elective; senior year; second semester; two credits; two recitations.

209. GERMAN. Conversational course. Provides interesting and profitable conversational drill on practical everyday topics and includes, in a new form, a helpful review of the elements of the language.

Prerequisites: Courses 201 and 202.

Elective; junior year; first semester; one credit; one recitation.

210. GERMAN. A continuation of course 209.

Prerequisites: Courses 201, 202, 203, 204, 209.

Elective; senior year; second semester; one credit; one recitation

211. GERMAN. Conversational course. Provides well graded and systematically planned talks on all sorts of topics.

Prerequisites: Courses 201, 202, 203, 204.

Elective; senior year; first semester; one credit; one recitation

212. GERMAN. A continuation of course 211.

Prerequisites: Courses 201, 202, 211.

Elective; junior year; second semester; one credit; one recitation.

SPANISH

301. SPANISH. Grammar; elementary forms; oral and written exercises; reading of easy text, 100-150 pages.

Sophomore year; first semester; three credits; three recitations

302. SPANISH. A continuation of course 301.

Prerequisite: Course 301.

Sophomore year; second semester; three credits; three recitations.

303. SPANISH. Grammar continued; reading of intermediate texts; oral and written exercises.

Prerequisites: Courses 301, 302.

Junior year; first semester; three credits; three recitations.

304. SPANISH. A continuation of course 303.

Prerequisites: Courses 301, 302, 303.

Junior year; second semester; three credits; three recitations

In addition to the regular second year's work, a special elective conversational course is offered for all students who have completed the first year's work.

305. SPANISH. Conversational course. Provides interesting and profitable conversational drill on practical every-day topics and includes, in a new form, a helpful review of the elements of the language.

Prerequisites: Courses 301, 302.

Elective; junior year; first semester; one credit; one recitation

306. SPANISH. A continuation of course 305.

Prerequisites: Courses 301, 302, 305.

Elective; junior year; second semester; one credit; one recitation.

307. SPANISH. Literature course. Reading of standard selections from Spanish general literature.

Prerequisites: Courses 301, 302, 303, 304.

Elective; senior year; first semester; two credits; two recitations.

308. SPANISH. A continuation of course 307.

Prerequisites: Courses 301, 302, 303, 304, 307.

Elective; senior year; second semester; two credits; two recitations.

309. SPANISH. Conversational course. Provides well graded and systematically planned talks on all sorts of topics.

Prerequisites: Courses 301, 302, 303, 304.

Elective; senior year; first semester; one credit; one recitation.

310. SPANISH. A continuation of course 309.

Prerequisites: Courses 301, 302, 303, 304, 309.

Elective; senior year; second semester; one credit; one recitation.

PHYSICS

Professor Weniger.

Mr. Bevan

Mr. Blair

Mr. Belknap

The following courses are offered:

A. ELEMENTARY PHYSICS. An elementary course in physics adapted to students just beginning geometry.

The Secondary courses in Mechanic Arts, and Forestry; second year; first semester; four credits; three recitations; one laboratory period.

B. ELEMENTARY PHYSICS. A continuation of course A.

Second semester; four credits; three recitations; one laboratory period.

101. ENGINEERING PHYSICS. This course covers the entire field, especial emphasis being laid on mechanics, heat and electricity. A working knowledge of trigonometry is required for entrance.

The courses in Engineering and Forestry; sophomore year; first semester; five credits; two lectures; two recitations; one laboratory period.

102. ENGINEERING PHYSICS. A continuation of course 101.

Second semester; five credits; two lectures; two recitations; one laboratory period.

103. ENGINEERING PHYSICS. A course designed for those students in Engineering and Forestry who have satisfactorily completed a course in elementary physics. For such students courses 103 and 104 will take the place of courses 101 and 102; this will allow such students to carry two credits of some elective subject each semester without increasing their total number of credit hours. A working knowledge of trigonometry is required for entrance.

Sophomore year; first semester; three credits; one lecture; one recitation; one laboratory period.

104. **ENGINEERING PHYSICS.** A continuation of course 103.

Second semester; three credits; one lecture; one recitation; one laboratory period.

111. **GENERAL PHYSICS.** A course in general physics, descriptive rather than mathematical in character, covering the subjects of mechanics, heat and electricity. A good working knowledge of geometry is the only prerequisite.

The courses in Agriculture, Pharmacy; freshman year; and Commerce, sophomore year; first semester; three credits; two recitations; one laboratory period.

112. **GENERAL PHYSICS.** A continuation of course 111.

Freshman year; second semester; three credits; two recitations; one laboratory period.

131. **HOUSEHOLD PHYSICS.** A brief descriptive course with such applications as are of greatest interest to students in Domestic Science and Art.

The course in Domestic Science and Art; sophomore year; first semester; three credits; two lectures; two recitations.

201. **ELECTRICAL AND MAGNETIC MEASUREMENTS.** A laboratory course in the exact determination of electrical and magnetic quantities, calibration of instruments, etc.

The course in Electrical Engineering; junior year; first semester; two credits; one three-hour laboratory period.

The course will be repeated during the second semester, as an elective, should a sufficient number of students apply.

202. **ELECTRICITY AND MAGNETISM.** An advanced course, taking up the theory of electrical measuring instruments, etc., with suitable practice in the laboratory.

Elective; credit to depend on work done.

211. **HEAT AND LIGHT.** An advanced course, taking up the phenomena of heat and light in detail, including recent discoveries.

Elective; credit to depend on work done.

212. **ILLUMINATION.** A study of illuminants and their utilization in exterior and interior illumination.

Prerequisites: Physics 101, 102.

The course in Electrical Engineering; senior year, elective; second semester; three credits; three recitations for two-thirds of the semester; laboratory work for one-third of the semester.

222. WIRELESS TELEGRAPHY. A study of electric waves, their measurement, and their application to practical wireless telegraphy.

Prerequisites: Math. 51, 52; E. E. 101.

The course in Electrical Engineering; junior or senior years, elective; second semester; three credits.

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PHYSICAL EDUCATION

Professor Stewart

Professor Thayer

Mr. Arbuthnot

Miss Plock

Mr. _____

PHYSICAL EDUCATION FOR MEN

ATHLETICS. All college athletic contests are under the jurisdiction of the athletic board, composed of two members of the faculty, two members of the student body and one alumnus; and the faculty committee on athletics, composed of six members of the faculty.

Direct and active supervision comes from the athletic board, while the faculty committee determines matters of policy and questions which have an important relationship to college affairs. The athletic board supports representative teams in football, basketball, wrestling, track and baseball, and awards monogram "O's" to members of these teams. The most efficient coaches are furnished to all of these teams, while assistants teach the theory and practice of the various sports to freshmen and other teams.

The new gymnasium will furnish to the students at the Oregon Agricultural College the most modern and complete equipment for specializing in indoor sports, while the new athletic field now under course of construction will include a new quarter mile track, two football fields, and two baseball diamonds, together with eight tennis courts and outdoor handball courts.

The armory, one of the largest of its kind in the United States, provides fine facilities for winter training in football, track, baseball, and the various other outdoor sports. An indoor track, which is but eight laps to the mile, furnishes facilities which are proving a great aid in shaping all of the teams into condition.

GYMNASIUM WORK. Because physical health determines capacity for efficiently carrying out work which a student prepares for in college, the importance of Physical Education in the modern educational institution is being emphasized more and more every year. The functions of this department are: (1) To develop organic power, the basis of vitality, necessary to physical and mental efficiency; and (2) to secure and maintain a good posture, harmonious muscular control, and a reasonable degree of scientific training for expert gymnasium and field athletic work.

The new gymnasium for men, which it is expected will be completed in time for work at the opening of the College in September, 1913, will be equipped with all of the modern gymnastic apparatus and facilities for properly carrying on the work in physical education and recreation. The floor, 90 x 150 feet in dimensions, will furnish ample space for the most efficient type of gymnasium work. It will be surrounded by a running track of fourteen laps to the mile.

Features of the new gymnasium which will add to its attractiveness will be two regulation sized handball courts; two squash courts; three basketball courts; one 100 x 50 ft. swimming pool; regulation sized, padded rooms for boxing and wrestling; bowling alleys; steel lockers to accommodate 2,500 students; modern hygienic showers, steaming rooms, hot rooms, etc., for scientific care of the body.

The treasurer's receipt for the \$1.50 gymnasium fee entitles the holder to registration at the gymnasium office for full privileges of the gymnasium, including physical examination, chart of measurements, locker, free towels, etc.

On the basis of the physical examination, special work of such a nature as the student's physique demands will be assigned, and a careful plan outlined for the symmetrical development of the body.

Two periods per week of Physical Education are required of each man student until his junior year. No student is subject to excuse from this work except by special action of the College council, and by recommendation of the director of the department.

Membership and regular practice on any of the varsity squads

is accepted as an equivalent for gymnasium work during the active practice season, the attendance being reported weekly.

FALL WORK. Instruction is given in both theory and practice of Physical Education. During the warm weather of the first semester the department emphasizes the desirability of outdoor work, furnishing a large and efficient corps of instructors in football, basketball, tennis, volley ball, soccer, swimming, cross country, track athletics, etc.

WINTER WORK. The active gymnasium work starts with the beginning of the fall rains, about October 15, when outdoor work is no longer convenient. The work prescribed is intended to correct cases of scoliosis, flat-foot, weak chest, round shoulders, or any other deformity which is susceptible of improvement through prescribed gymnastics.

Recreative games, such as basket ball, indoor baseball, wrestling, boxing, indoor tennis, volley ball, etc., are also conducted during the winter period.

SPRING WORK. In the spring, full advantage will be taken by the gymnasium instructors of the opportunity for cross country runs, track and field work, and out-door games with the classes, during which occasions correct methods of breathing, form in running, and proper carriage of the body will be emphasized.

NORMAL COURSE. Many students expect to take up the profession of teaching after graduation from college. A general knowledge of the theories of physical education and methods of gymnastics and athletic instruction is often of material assistance in securing important teaching positions.

Students showing an especial aptitude and interest in physical education will be admitted to this course. The work will include lectures on the history and development of physical training, the general physiological principles of exercises, methods of teaching, and first aid to the injured. Calisthenics, gymnastic drills, apparatus work, games, and athletics will comprise the practical work of the course.

Elective; hours and credits subject to arrangement.

All sophomores, freshmen, and students of the Secondary courses, unless physically unable, are required to take physical training. The classes meet twice a week for sixty-minute periods.

HYGIENE. A special lecture course in Hygiene is arranged to give general information regarding the laws of health to all freshmen students. The purpose will be to instruct in a popular way in the general principles of hygiene. Lectures will be given by specialists leading to a comprehensive knowledge of the human machine and its relation to healthful social life. Lectures on bacteriology, and its relation to health and well being, will be included in the course. Ventilation, physical exercise, recreation, diet, and bathing, will also be discussed. Hygiene of occupation will be considered in this course, and the importance of good physical habits as a commercial asset will be emphasized.

COURSES IN PHYSICAL EDUCATION FOR MEN

PRACTICE.

11. First year Secondary; first semester; two periods a week.
12. First year Secondary; second semester; two periods a week.
13. Second year Secondary; first semester; two periods a week.
14. Second year Secondary; second semester; two periods a week.
15. Freshman year; first semester; two periods a week.
16. Freshman year; second semester; two periods a week.
17. Sophomore year; first semester; two periods a week.
18. Sophomore year; second semester; two periods a week.

THEORY.

19. **HYGIENE.** Freshman year; all degree courses except Domestic Science and Art; second semester; one lecture per week.

PHYSICAL EDUCATION FOR WOMEN

PURPOSE. The aim of this department is to bring each student to her best possible physical condition, and by a careful system of gymnastic training to correct faulty posture and carriage, to aid in the formation of habits of hygienic living, to establish a normal

condition in the circulatory and respiratory systems, to secure bodily vigor, and to attain a healthy and symmetrical development, rather than the greatest increase in mere muscular power. Students are under the care of teachers who have had thorough medical training, and will be given special medical and corrective gymnastics, prescribed according to individual needs as indicated by their physical examinations.

REQUIREMENTS. Physical Training is prescribed for all secondary students and for all college women during their first two years of residence, for three periods a week. Two periods are to be taken in regular class work, and the third period may be elected by the student, if physically qualified, in sports or dancing; or in corrective work, if such work is necessary for better physical development. Any student, however, who, after the completion of her two years' required work, does not have a good posture and carriage, may be required to take corrective gymnastics.

Women students are required to be able to swim a distance of 35 yards by the end of their sophomore year. (This requirement will go into effect after the completion of the swimming pool in the new gymnasium.)

SPECIAL CORRECTIVE AND MEDICAL GYMNASTICS. Students who are shown by their physical examinations to be unfit for the work of the regular classes in gymnastics and sports, or to have physical defects, will be assigned to corrective classes where the work is light and the emphasis is laid on correct breathing and posture, relaxation and rest; or, whenever necessary, students will be given private work in medical or corrective gymnastics according to their individual needs. Thus the physical condition of each student is carefully diagnosed and supervised. The instructors encourage conferences concerning matters of health, personal and sex hygiene, and as far as possible advise proper treatment for the student's temporary ailments. They also take care of the emergency and first aid work for the women of the College.

COSTUMES. In order that the gymnasium costumes be hygienic and uniform, a regulation suit and shoes are required of all students. The shoes are sold by the local dealers, subject to the

approval of the director. The suits should be ordered at the gymnasium office, immediately upon arrival at the College.

Good second-hand uniforms of outgoing girls will be for sale at about \$4.00, while the new uniforms cost \$5.00.

Special Work in Physical Education

Students permitted to pursue special work in Physical Education for the purpose of teaching, should elect classes in regular and corrective gymnastics besides Aesthetic and Folk Dancing and various kinds of outdoor sports. It should be noted, however, that only under special circumstances will such free election of courses be allowed.

In addition to the practice work, the following courses in theory are advised for students permitted to pursue this special work.

English and English Literature; German (knowledge sufficient to read and study medical works); Physics; Chemistry; Physiology (Elementary and advanced); Hygiene (personal and school); Botany; Psychology; Education; Sociology; Bacteriology; Anatomy; Home Nursing; Theory of Gymnastics; Play and Playground Games; Public School Methods and Practice Teaching.

COURSES IN PHYSICAL EDUCATION FOR WOMEN

REQUIRED COURSES.

PRACTICE.

In the regular courses in Elementary and Intermediate Gymnastics a variety of work is taught. Both the Swedish and German systems of gymnastics are used, and the best in both is adapted to the needs of the classes. Much emphasis is laid on correct posture and breathing. The following order is usually observed: (1) Tactics; (2) exercises which include all the groups of muscles, taken free hand or with light hand-apparatus (wands, dumbbells or Indian clubs); (3) apparatus exercises for those physically

adapted; (4) recreative work at the end of the lesson, games or fancy steps.

1. ELEMENTARY SECONDARY GYMNASTICS; first semester; three hours per week.

2. ELEMENTARY SECONDARY GYMNASTICS; second semester; three hours per week.

Prerequisite: Course 1.

3. INTERMEDIATE SECONDARY GYMNASTICS; first semester; three hours per week.

Prerequisites: Courses 1 and 2.

4. INTERMEDIATE SECONDARY GYMNASTICS; second semester; three hours per week.

Prerequisites: Courses 1, 2 and 3.

5. ELEMENTARY COLLEGE GYMNASTICS; first semester; three hours per week.

6. ELEMENTARY COLLEGE GYMNASTICS; second semester; three hours per week.

Prerequisite: Course 5.

7. INTERMEDIATE COLLEGE GYMNASTICS; first semester; three hours per week.

Prerequisites: Courses 5 and 6.

8. INTERMEDIATE COLLEGE GYMNASTICS; second semester; three hours per week.

Prerequisites: Courses 5, 6 and 7.

(It should be noted that Gymnasium work is required of all college women during their first two years of resident work regardless of how they may be classified.)

THEORY.

HYGIENE. Freshman year; second semester; one lecture per week.

ELECTIVE COURSES.

26. CORRECTIVE GYMNASTICS. Open to all students who have need of remedial work. Special attention is given to those having

spinal curvature, round shoulders, narrow chests, forward heads, weak backs, pronated ankles, and other physical defects or weaknesses.

27. **OUTDOOR SPORTS.** Open to all students physically qualified. In this course are taught a variety of games, including baseball, indoor baseball, soccer, playground ball, cross ball, track athletics and relay racing. In the rainy season games are played in the Armory.

One, two, or three periods a week.

28. **BASKET BALL.** Open to students physically qualified. In good weather the games will be played outdoors.

One period a week for each class throughout the year.

29. **SOCCER.** Open to all students physically qualified.

One period a week in the spring and fall.

30. **BASEBALL.** Open to all students in spring and fall seasons.

One period a week.

31. **INDOOR BASEBALL.** Open to all students during indoor season.

One period a week.

32. **HOCKEY.** Open to all physically qualified.

One period a week in the spring and fall.

33. **CROSS BALL.** Open to all students physically qualified.

One period a week during the outdoor season.

34. **TENNIS.** Courts will be assigned to those who wish to play regularly.

35. **SWIMMING.** One or two lessons a week are allowed each student.

36. **FENCING.** Open to all students.

One period a week during indoor season.

37. **INDIAN CLUBS.** Open to all students.

One period a week during indoor season.

38. **AESTHETIC DANCING.** (Elementary). Open to all students. The purpose of this course is to develop grace and freedom of movement. Classic dancing, which is now considered one of the most important phases of gymnastic exercise, is emphasized.

One or two periods a week.

39. AESTHETIC DANCING. (Intermediate). Open to all students who have completed course 38.

One or two periods a week.

40. FOLK DANCING. Open to all students. In this course are taught a variety of peasant and national dances suitable for recreation or teaching.

One period a week.

41. THEORY OF GYMNASTICS. Open to all students interested in the teaching of school gymnastics. This course is very elementary, but gives an insight into public school conditions and methods of teaching practical gymnastics. Each student learns how to teach proper breathing, correct posture, and simple prescriptions of corrective exercises for round-shouldered and hollow-chested children.

One period a week for one semester. One credit.

42. THEORY OF GYMNASTICS. Continuation of Course 41, and open to all students who have completed course 41.

One period a week for one semester. One credit.

*43. PLAY AND PLAYGROUND GAMES. Open to all students. This course is designed for public school teachers or students interested in playground work, or wishing to specialize in Physical Education. The psychology of play, adaptation of play to varying ages, necessity of supervision of play, simple equipment for school playgrounds, organization of games, will be given briefly. The majority of the time, however, will be given to the practice of various playground games and simple folk dances.

Five periods a week for one semester. Two credits.

*Offered in Summer School, 1913.

MILITARY SCIENCE AND TACTICS

Lieutenant Hennessey

The Oregon Agricultural College was founded in pursuance of three lines of national legislation. The first of these was the act of Congress known as the Congressional Land Grant Act, of July 2, 1862, and the acts supplemental thereto, for the establishment of colleges "where the leading object shall be, without excluding other classical and scientific studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts."

The absolute dependence of the College upon the benefactions of the Nation and the State imposes a particular obligation on all who enjoy its privileges. The College, on its part, conforming to the spirit of law, has provided for an efficient system of military instruction, and the Corps of Cadets is entitled to the loyal, zealous, and true support of each and every student in the College. That it receives that support each year will be best evidenced by the standing which the corps attains among the military organizations of the higher universities and colleges.

The Congressional Land Grant Act of 1862 requiring military instruction, was passed during a critical period in the life of the Nation while it was engaged in a civil war. The best of evidence was then at hand showing the need of trained citizen soldiers prepared at all times for service in the cause of the Nation. The object of the law, therefore, was to provide well trained citizen soldiers. The object has been successfully met. Students enrolled in the Military Department may attain a high state of military proficiency if the spirit as well as the letter of the law is followed out during the prescribed course, thereby fulfilling a duty to the Nation, the State, and the College.

The military body of this College consists of one regiment of infantry having three battalions of four companies each, a hospital

corps and signal corps detachment, and a band of thirty-two instruments. The drill and administration are the same as in the Regular Army.

One of the objects of this instruction is to prepare the cadet so that upon graduation he will be thoroughly competent to hold a commission in the National Guard or volunteer army.

The greater part of the instruction is directed toward having cadets adopt a systematic rule of conduct inculcating accurate methods in everything they undertake. This not only places cadets in the condition to receive favorably all instruction in the military department, but facilitates study in the other departments, and becomes a valuable asset to a young man going out into the world in any profession.

Military drill improves the habits and manners of the student, develops him physically, and gives him that military knowledge which it is desirable every citizen should possess in order that he may render intelligent aid to his country or state in time of need. It cultivates a manly spirit, ready and implicit obedience, respect for authority and self restraint—all qualities of inestimable value to a young man in whatever calling he may select.

Instruction in the course is prescribed for all undergraduate male students. Students physically unable to bear arms may be excused from active military drill, and will be assigned some light duty by the head of the department. The instruction is both practical and theoretical.

The new armory contains a drill room 120x300 feet in extent, ample office room and suitable rooms for storing guns and other ordnance.

Eight hundred and forty modern U. S. magazine rifles (Krag-Jorgensen), with equipment and ammunition, are furnished by the U. S. Government. Other necessary accoutrements and apparatus for the thorough equipment of the military department are furnished by the College.

Appointment and promotion of officers and non-commissioned officers, and their relative rank in each grade, are determined according to the military standing of the cadets, based upon a careful consideration of the following points: Knowledge of drill

and other duties as determined by examination, practical application of this knowledge on the drill field, and recommendations of superior officers; zeal, soldierly bearing, and aptitude for command; character; military record; general standing in College.

Commissioned officers are selected from the senior class or from such students as have had three or more years of drill; non-commissioned officers, from the junior and sophomore classes; all reductions are to the grade of private. All appointments and promotions are made by the commandant, with the approval of the President of the College.

Drill is required during the secondary, freshman, sophomore, junior and senior years, four hours per week. Senior privates may be excused from drill. The practical course in infantry includes the school of the soldier, company and battalion; in close and extended order; evolutions of the regiment; ceremonies; guard and outpost duty; target practice and battle tactics.

Paragraph 24, General Orders No. 231, War Department, November 16, 1909, directs that, "Upon occasions of Military Ceremony, in the execution of drills, guard duty, and when students are receiving any other practical military instruction, they shall appear in the uniform prescribed by the institution. They shall be held strictly accountable for the arms and accoutrements issued to them."

The wearing of mixed civilian and uniform clothing is prohibited at all times. The uniform complete costs about \$21.40; it is of the regulation olive drab color adopted by the United States Army, and makes a very neat and serviceable suit.

Students must come prepared to deposit the price of the uniform, for which they will be measured as soon as they learn the position of a soldier.

Proficiency in the military department is a requisite to graduation.

1. THEORETICAL INSTRUCTION. This instruction consists of recitations in Infantry, Drill Regulations, Field Service, Regulations, Manual of Guard Duty, and Army Regulations; instruction in military correspondence and reports and returns; lectures on military subjects that pertain to the organization and administration of the United States military forces in peace and in war.

Junior year; first semester; one credit; one recitation or lecture.

2. THEORETICAL INSTRUCTION. Junior year; second semester; one credit; one recitation or lecture.

3. THEORETICAL INSTRUCTION. Senior year; first semester; one credit; one recitation or lecture.

4. THEORETICAL INSTRUCTION. Senior year; second semester; one credit; one recitation or lecture.

THE BRODIE BANNER is a richly decorated silken banner that is carried by the best drilled company as a mark of merit. Each year it goes to the company making the highest total number of credits in competitive drill. Company D carries the honor for 1912-13.

COLLEGE EXTENSION

Professor Hetzel

Mr. Collins

Miss Webb

Miss Moore

College and Experiment Station staffs co-operating.

The complete mission of the Oregon Agricultural College, as understood by those who are charged with the direction of its efforts and the determination of its policies, is to serve the people of the State. This service clearly extends to those who come to its campus and claim the advantages of its instructional work. But its mission does not end there. It is concerned, also with the interests of all who may be in a position to benefit from its assistance. It is in the prosecution of this conception of the mission of the College that a Division of Extension has been created and charged with the task of extending to the people of the State the advantages of their institution.

The indefatigable efforts of the authorities and staff members of the College and Experiment Station, extending over a period of many years, have resulted in the establishment of valuable service in the form of institutes, lectures, demonstrations, demonstration trains, the preparation and distribution of bulletins, and co-operative effort in connection with private and community interests. But the growth of the State and the correspondingly greater demands made upon the College, have made it necessary to provide an organization which shall give its exclusive attention to college extension. It has become necessary to systematize the extension service in order to guarantee its highest efficiency.

THE EXTENSION SUBJECTS. The extension work is concerned with all instruction given by the College which is not classified as a part of the regular resident work. The subjects which are included

in the extension work are, therefore, all the subjects taught at the College which are of such a nature as to lend themselves to extension methods. While the College, in the past, has been exclusively concerned with agricultural and domestic science and art extension, it has now provided for extension work in all lines of instructional effort. There will be, in addition to all of the various branches of agricultural extension, which include agronomy, horticulture, gardening, animal and poultry husbandry, dairying, entomology, and other related subjects, extension instruction in domestic science and art, forestry, mining engineering, mechanical engineering, electrical engineering, civil engineering, commerce, education, and other scientific and industrial subjects. While it is clearly impossible to attempt to give complete and full courses in the great majority of these lines of work, there is much that is practical, usable, and valuable that can be taught through extension methods. It is, then, only such branches of the college work as can be effectively taught without residence requirement, that will come within the scope of extension work.

THE EXTENSION AGENCIES. The agencies, which the College expects to use in disseminating information among the people of the State, are as varied as the conditions which will be met in carrying out the work.

The plan, as it is now conceived will include the use of institutes, itinerant schools, lectures, demonstrations, and demonstration trains, as one distinct group of extension methods. The institutes will include the farmer's institutes, as held in the past, and other special institutes, such as school teachers' and domestic science institutes. The itinerant schools will consist of a staff of lecturers, numbering from three to ten, who will go out from the College equipped with portable laboratories that may be used in demonstrating their work, and who will remain in each of the various communities from three days to a week. The lectures will be given upon any of the many occasions when the service of some member of the College staff may be of value. The demonstration trains will be run from time to time in co-operation with the railway companies. These will vary in the scope of the work undertaken from a single car to a full train equipped to demon-

strate many lines of work. By these methods the College hopes to be able to extend directly to those who cannot come to it, the advantages of its instruction.

The second group which is to be used, is that of correspondence courses. The plans provide for correspondence courses in all the lines of work given at the institution which may be carried on by this method. Up to the present time, it has been possible to provide for only one general course of correspondence study, viz., the Commercial Course. The subjects now offered in this course are (1) Farm Accounting. (2) Rural Economics. (3) Commercial Law. These courses are offered to the residents of the State for a normal fee.

The third division of the work will be concerned with co-operative efforts in connection with community organizations. This will include the organization of the boys and girls of the State into associations and clubs for the study of industrial work. The industrial fair movement, which has been so vigorously advanced this year, indicates something of the methods by which the boys and girls will be instructed and assisted.

The College will be concerned, also, in this connection, with organizations among the adults. It is the purpose of the extension lecturers to foster and encourage the organization of improvement associations and clubs throughout the State and to assist them in the work which will tend to improve local conditions. Where these organizations now exist and are doing effective work the College will co-operate and assist in every possible way.

The Oregon Library Commission is now doing a splendid work by furnishing well selected libraries to organizations of this kind. The Commission has consented to co-operate with the Extension Division of the College in extending this line of work and making it even more effective. This should result in stimulating interest among the people of the State, and especially in the rural districts, in social and industrial conditions, and place within their reach the means by which their interests may be materially advanced and their conditions improved.

The fourth division of the extension work is that which is concerned with the extension publications and educational exhibits.

From this department there will be published many bulletins written in clear simple form which will tell the secrets of applied science and improved methods, and which will make it possible for the laborer, the clerk, the farmer, the mechanic, and the housewife to ease and vitalize their daily tasks. Helpful articles will be furnished to the newspapers and the magazines.

The exhibits, which it has been the custom of the College to make at the State Fair, will be enlarged, and in all probability more exhibits will be made at county fairs, association meetings, and conventions. These will be in the form of educational demonstrations.

One of the most important features of the College extension service, as provided for by laws passed by the last legislature, is the county field and demonstration work in agriculture. The new law authorizes the county court of each of the several counties of the State to provide and appropriate funds, either by special provision in the annual tax levy or by an appropriation of funds not otherwise appropriated, to be used in field work in agriculture and in promoting farm demonstration work in such county.

The law further provides that the State will appropriate one dollar for each dollar so raised by the respective counties, the appropriation not to exceed \$2,000 a year to any county having an area of 5,000 square miles or less, and not to exceed \$4,000 to any larger county. This fund is to be expended, and the work is to be done, under the supervision of the State Agricultural College.

This feature of the law contemplates placing county agricultural advisors in such counties as take action under the law. These agents, under the direction of the Agricultural College, will arrange for and carry on co-operative farm demonstration work with farmers in various sections of their respective counties. They will study conditions, and advise farmers as to the crops best adapted to their locality, and the best methods in agricultural practice. They will aid the teachers of the public schools in giving proper instruction in agricultural subjects, and help to interest our young people in country life, directing their energies into the proper channels. In short, the county agent will be a traveling agricultural evangelist devoting his time to improving country

conditions and country life. It will be his task to combine the results of scientific discovery with the best experience of practical farmers, and apply them to conditions as he finds them.

PRESENT ORGANIZATION. It will readily be seen that the scope of the work here outlined will require considerable time for its organization and perfection. During the next year the extension work will be organized and prosecuted according to the laws passed by the 1913 session of the legislature. This will be along the lines above indicated and to as great an extent as funds and conditions will permit. The College extension staff will be enlarged, and it is hoped that a number of the counties will take steps in the very near future to provide for the county field and demonstration work.

In the meantime, the College will continue to offer lectures, hold institutes, co-operate with the railway companies in running demonstration trains, publish extension bulletins, co-operate with the school authorities of the State in the advancement of industrial education, offer some courses by correspondence, prepare and circulate exhibits, furnish many valuable articles to the newspapers and magazines, and carry on demonstrations on farms and in the orchards of the State.

HOW TO APPLY. All persons or communities in the State wishing assistance in any of the lines indicated should communicate with the Extension Division as far in advance of the time the service is desired as possible. If an institute is desired, be sure to give all particulars pertaining to the time, the nature of the subjects in which such community will be interested, the number of speakers desired, and the plans for the meeting. If a single lecture, or demonstration, or exhibit is desired, be equally prompt and explicit.

It must be remembered that the College is willing at all times to help all who apply, but that its staff, facilities, and funds are limited, and so it sometimes is unable to give aid where it would like most to give it. However, the College can serve in the great majority of cases and is always ready and glad to do so.

Any county desiring to organize under the provisions of the law for agricultural field and demonstration work should communicate with the Director of Extension at the Agricultural College in order to determine the best methods of procedure.

SCHOOL OF MUSIC

Professor Gaskins

Mrs. Gaskins

Mrs. Ressler

Miss Bowden

Mr. Beard

Miss Johnson

The advantage of studying music with instructors skilled in the psychology and practice of teaching cannot be overestimated. It results in an appreciable saving of time and expense and a maximum gain in efficiency. Hence the School of Music offers the following comprehensive courses of study to earnest students who wish to acquire scholarly musicianship at moderate cost. The courses may be begun at any time during the school year. All students may advance as rapidly as is consistent with good scholarship. The time required for completion of any of the courses is dependent upon the age, previous preparation, talent, ability, and character of work of each student.

In these courses the following subjects are included: Conducting, elements of music, history of music, interpretation, languages, music form and analysis, music pedagogics, song singing, oratorio singing, opera singing, choral singing, organ playing, organ structure, piano playing, piano structure, sight reading, stage deportment, stringed instrument playing, wind instrument playing, brass instrument playing, theory, harmony, counterpoint, composition, voice culture. Outlines of the courses:

1. VOICE. Exercises will be given for correct breath control; purity of tone production; freedom of action and blending of registers; articulation and correct pronunciation and enunciation of vowels and consonants; elements of phrasing and style. Students must appear on programs if requested, singing from mem-

ory, and attend all rehearsals and recitals unless otherwise instructed by the Director.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; sight reading and ear training, two hours a week; harmony and history of music, two hours a week each; choir and chorus practice throughout the year. Physical culture.

2. VOICE. This course consists of exercises for tone placing; phrasing and style; legato, marcato, and portamento delivery. Physiology of the vocal mechanism. First year German, Italian, or French, at student's option unless otherwise advised by the Director. Songs and exercises of medium grade of difficulty. Attendance at recitals and rehearsals required, unless otherwise directed as above.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; harmony and counterpoint, two hours a week each; German, Italian or French, as required in beginning work by the Department of Modern Languages; physical culture; choir and chorus practice throughout the year.

Prerequisite: Course 1 or its equivalent.

3. VOICE. This course includes the study of tone color, agility, the trill, messa di voce, recitation, declamation, phrasing, style, through the use of songs in English, German, French, Italian; the regular second year study of one of the above foreign languages at the student's option, in the Department of Modern Languages, unless otherwise advised by the Director. Attendance at recitals and rehearsals required unless otherwise directed as above, singing from memory on programs of the School of Music when so requested.

Required: Two lessons a week in voice; two lessons a week each in advanced harmony and harmonic analysis; German, French, or Italian, at student's option, second year study as required in Department of Modern Languages; choir and chorus practice throughout the year; physical culture.

Prerequisite: Course 2 or its equivalent.

4. VOICE. This course includes advanced study of vocal technique by means of difficult exercises, songs, oratorios, operatic arias, declamation. Advanced composition throughout the year.

Attendance at rehearsals required in preparation for public appearances and at recitals, singing from memory. For graduation a public recital must be given as arranged by the Director, unless he may specify to the contrary. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 3 or its equivalent.

5. PIANO PREPARATORY COURSE. FOR BEGINNERS. Training of the hand, fingers, wrist, and arm. Extended preparation for scales and arpeggios; exercises for same. Chords. Octaves. Sonatinas by Clementi; Kuhlau; smaller compositions of Mozart, Handel, Beethoven, and other composers. Easiest sonatas of Haydn and Mozart. Selections from easier works of Schumann, Kullak, Reineke, and Grieg; other easy, appropriate compositions.

Required: Two lessons a week in piano; practice with instrument, one to three hours daily.

6. PIANO. Scales and arpeggios, tempi, accent, nuance, rhythm. Double notes. Trills. Exercises for endurance, speed, accent, and rhythm. Etudes from Czerny, Cramer, Kullak, Krause, Two-part inventions and dance forms by Bach. Easier sonatas of Haydn, Mozart, Beethoven. Easier composition of Mendelssohn, Schubert, Schumann, Grieg, Raff, and others.

Required: Two lessons a week in piano; two lessons a week in harmony; two lessons a week in music history for thirty-six weeks; practice with instrument, two to four hours daily. Physical Culture.

Prerequisite: Course 5 or its equivalent.

7. PIANO. Two and three-part inventions and suites by Bach. Etudes of Czerny, Cramer, Hasert, Berens. Sonatas of Beethoven of moderate difficulty. Sonatas of Mozart. More difficult selections from Weber, Mendelssohn, Schumann, Chopin, Grieg, Liszt, Mozart concertos; transposition of easy hymns; to sight read readily; to play from memory five compositions from the preceding course in a satisfactory manner.

Required: Two lessons a week in piano; two lessons a week for thirty six weeks in advanced harmony; one lesson a week in counterpoint; practice with instrument three to five hours daily. German or French. Physical Culture.

Prerequisite: Course 6 or its equivalent.

8. PIANO. Collegiate Course: Well tempered clavichord, chromatic fantasy and fugue, Bach. A limited number of etudes by Rubinstein, Chopin, Henselt. The more difficult sonatas of Beethoven. Solo works of Mendelssohn, Chopin, Schumann, Grieg, Liszt, Brahms. Concertos by Mozart, Mendelssohn, Beethoven.

Required: Two lessons a week in piano; practice with instrument three to five hours daily; two lessons a week in composition; one hour a week in harmonic analysis; German or French. Physical Culture.

To complete this course satisfactorily the student must fulfill the requirements above outlined and appear in programs when requested by the Director.

9. PIANO. Graduate Course; Beethoven sonatas Op. 57, 106, 110. Liszt Rhapsodies. More extended study of the principal classics and romantic composers. Solo works of modern composers. Concertos by Schumann, Chopin, Beethoven, and other composers.

Following is the list of graduate course pieces of which the student must play six from memory: Wagner-Liszt—Tannhauser March; Chopin—Scherzo in B Minor, op. 31; Mendelssohn—Rondo Capriccioso, op. 14, Prelude and Fugue in A Minor; Variations Serieuses; Schumann—Kreisleriana, op. 16, Carnival, op. 9; MacDowell—Marzwind and Wald Idyllen, op. 19, Nos. 1, 3, and 4; Fugue in A Minor—Bach, or his Italian Concerto; Suit in D—Handel; Caprice Espannol, op. 37—Moszkowski; Concert Etude, op. 36—MacDowell; Ballade—Grieg; Liebestod (Tristan and Isolde)—Liszt; Bach—Chromatic Fantasy and Fugue; Mozart—Fantasia in C Minor; Sonata in F—Rubenstein; Beethoven: Sonatas to be selected. Concertos by Chopin, Henslet, Hummel, Liszt, MacDowell, Mendelssohn, Mozart, and Saint-Saens, or five other works at teachers' option.

Required: Two lessons a week in piano; practice with instrument three to five hours daily; advanced German or French. For graduation, students are required to perform publicly under the direction of the School of Music, playing a program not less than one hour in length, arranged by the instructor and approved by the Director, which shall include two or more numbers equal in difficulty to any composition in the list of graduate course pieces. A diploma will be issued upon the satisfactory completion of this course.

10. **THEORY.** The course in theory will comprise systematic and progressive study in the elements of music. Consideration will be given to the theories of acoustics, to notation, scales, keys, modes, sight reading, intervals, melodic progression, tempo, dynamics, rhythm and ear training. Advanced theory will embrace harmony, counterpoint and subdivisions thereof, music history, concluding with form, composition and orchestration.

11. **VIOLIN.** This course is preparatory and designed to develop correct fingering, free bowing, and accuracy as to pitch and rhythm. Appropriate studies by the following composers, or acceptable equivalents, are required for satisfactory performance before advancing to course 12.

Schubert, Dancla, DeBeriot, Pleyel, duets, Dort, Hayser. Accurate playing of all major and minor scales is required; students must appear in public recitals when required, playing from memory.

Required: Two lessons a week, harmony and music history as in course 6.

12. **VIOLIN.** Prerequisite, course 11. Studies by David Kayser, Schradieck, Kreutzer, or acceptable equivalents, for accuracy in playing all positions, and skill in scales and arpeggios at rapid tempos. Suitable solos, concertos, sonatas, ensemble playing at discretion of instructor. Students must appear in public recitals when requested, playing from memory. A certificate is granted upon completion of this course.

Required: Two lessons a week, harmony, counterpoint and advanced music history as in course 7.

13. **VIOLIN.** This course comprises the most advanced studies by Fiorillo, Rode, Paganini, Bach, concertos and sonatas of the old and modern schools, solos by Vieuxtemps, Wieniawski, and other compositions of similar difficulty. Students must appear in public recitals when requested, playing from memory.

To graduate, students must satisfactorily complete the above or its equivalent, complete Theory course as outlined for Piano III, and give a public recital, playing from memory program not less than an hour in length, arranged by the instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Band Instruments

Instruction will be given by the regular College band leader in the use of brass, wood-wind, and percussion instruments.

To become a member of the College Band a student must pass a satisfactory examination in the elements of music and ability to perform on his instrument.

Members are required to attend rehearsals each school day, and a reasonable amount of individual practice is expected.

There is no charge for instruction in the band. Each member must furnish his own instrument and music stand, except basses, baritones, altos, and drums, whose instruments are furnished by the College.

Any student desiring to enter the band should see that his instrument is in low pitch.

The courses for the various band instruments are as follows:

14. CORNET. Methods by Arbou; characteristic studies by St. Jacome.

15. CLARINET. Methods by Dieppo; studies by Dieppo and Blume.

16. FRENCH HORN. Methods by Franz; studies by Franz and Hayffman.

17. In all other band instruments, including the oboe, bassoon, saxophone, alto, and bass clarinets, drummer's trapps, xylophone, and orchestra bells, the courses will be similar to those given above.

The work in theory required to complete these courses is that outlined for piano courses 6 and 7.

18. THEORY. The course in theory will include systematic and progressive study of the elements of music; acoustics, notation, scales, keys, modes, sight reading, intervals, melodic progression, chords, rhythm, dynamics, and ear training.

Advanced theory will include harmony, counterpoint and subdivisions thereof, harmonic analysis, form, composition, and orchestration.

General Information

Any student in the Oregon Agricultural College with a satisfactory record in scholarship in his major course may take at least one hour a day in music.

Students in the School of Music may enter classes in the several departments of the College; and in order to enhance their general culture are encouraged to take at least one study throughout the school year other than the work required in the regular music courses.

Applicants for instruction may take complete or partial courses. Those registering for the former are classified as "regular music," while the others are classified as "special music."

"Special Music" students have the option of selecting such music studies as they desire by registering for the same with the Director in the regular manner and at the catalogue rates of tuition.

Non-resident young women are required to live in Waldo Hall, where their conduct is subject to the approval of the Dean of Women. Outside rooming and boarding places may be obtained subject to the approval of the College authorities. The rates for board and room are listed elsewhere in detail. (See index.)

Students registered for study in the regular course of the Oregon Agricultural College School of Music are subject to the same rules and regulations as all regular students in other courses.

No student is permitted to omit lessons or practice without sufficient excuse, and no refund will be made for absence from lessons or practice or for discontinuance, except in cases of severe personal illness; for such unavoidable absence, lessons may be made up only by appointment, and before the expiration of the term.

Lessons falling on legal holidays, or on special holidays petitioned for by the student body or by special student organizations, which may be granted by the College authorities, will not be made up.

Students will not be permitted to transfer tuition accounts to others, nor to receive credit for tuition fees beyond the assigned registration period, except in cases of severe personal illness attested by a physician, or similar extreme necessity, and then only by making suitable arrangements with the Director.

The college year in the School of Music consists of thirty-six weeks divided into terms of twelve weeks each, the first term beginning at the opening of college on September 19, 1913.

Private individual instruction is given in lessons of thirty minutes each in all departments of the School of Music. Class instruction in all theoretical branches is required of candidates for graduation, as specified in the preceding outlines of courses. Terms for instruction are as follows:

Voice culture and singing—Professor Gaskins. Private instruction.

One lesson a week, a term.....\$12.00

Two lessons a week, a term..... 24.00

Piano, voice culture and singing—Genevieve Baum-Gaskins. Private instruction.

One lesson a week, a term.....\$12.00

Two lessons a week, a term..... 24.00

Organ—Genevieve Baum-Gaskins. Private instruction.

One lesson a week, a term.....\$24.00

Two lessons a week, a term..... 48.00

Piano—May Babbitt-Ressler. Private instruction.

One lesson a week, a term.....\$12.00

Two lessons a week, a term..... 24.00

Violin, 'cello, mandolin, banjo—Florence Bowden. Private instruction.

One lesson a week, a term\$10.00

Two lessons a week, a term 20.00

Band instruments—Instructor Beard. Private instruction.

One lesson a week, a term.....\$10.00

Two lessons a week, a term..... 20.00

Music History—Professor Gaskins. Class instruction.

Two hours a week, a term\$ 3.00

Harmony, counterpoint, harmonic analysis—Instructor Johnson.

Two hours a week, classes limited to eight students. Each subject, a term.....\$10.00

Composition, orchestration—May Babbitt-Ressler. Class instruction.

Two hours a week, classes limited to eight students. Each subject, a term\$10.00

Sight singing, the rudiments of music and the theory of music, class instruction, two hours a week, free to students registered in the full music courses (those known as "regular music" students). To all persons not registered in the regular music courses, a term, \$3.00.

Rentals—Pianos and a pipe organ for practice will be furnished students of the School of Music at the following rates:

Piano—

Term of twelve weeks, one hour a day.....	\$ 5.00
Two hours	7.50
Three hours	10.00
Four hours	12.50
Five hours	15.00

Organ—

Term of twelve weeks, one hour a day.....	\$12.00
Two hours	18.00

The pipe organ is a new, modern Kimball two manual, concave pedal board instrument of beautiful tone.

For additional information address, William Frederic Gaskins, Director, Administration Building, Oregon Agricultural College, Corvallis, Oregon.

SUMMER SESSION

The chief purpose of the summer school is to afford an opportunity for study to those unable to attend during the academic year. The courses are arranged for elementary and secondary teachers; for town and rural supervisors; for credit in regular college subjects, as well as for prospective students deficient in entrance credit; for those interested in music and art; and for those desiring practical instruction in agriculture, household economics, and wood-work.

It is thought advisable to arrange for a series of two-week courses in addition to those continuing six weeks. They are provided for students who will not find it possible to remain longer than two weeks and are so planned that practically the entire time each day will be devoted to each special line of study. Should any decide to continue through the remaining four weeks of the summer session, a number of six-week courses, conducted on the topical method, will admit of the entrance of students with profit.

Of special interest is the inclusion in the two-week calendar of courses for boys and girls of upper grammar grades and high school age. At this formative period, an opportunity to study in an interesting way the problems of the two great fundamental occupations should arouse new ideals of the beauty, importance, and significance of such callings. The romance as well as the dignity of agriculture and home pursuits have their appeal to youthful imagination, but ordinary school education both consciously and unconsciously places the emphasis on the professions and occupations leading to a public career.

A large faculty, chiefly regular college instructors, supplemented by a number of specialists from Oregon public schools and from other states, the extensive equipment in classrooms, laboratories, libraries, shops and experimental fields, are at the service of the students.

The state-wide interest in garden and household contests of the public school pupils has resulted in a demand for more knowledge

of these industrial subjects on the part of the teachers. The summer courses will not only provide specific and detailed instructions for conducting these contests, but will show the teacher how to use the state-adopted text in elementary agriculture and supplement it with simple and interesting experiments both indoors and outdoors. In the same way, the direct and practical instruction in cooking and sewing will furnish the essentials for assisting the girl pupils. Any teacher who has the advantage of six weeks' contact with expert instructors and practical demonstrations in the work in which he is to direct his pupils, will greatly multiply his efficiency and usefulness in his community.

The winter short course comes at a time best suited to the convenience of the farmer. Professional and business men find their slack season during the summer, as do the youth who are attending school and the women of the family. The summer school offers them the opportunity of some study of the problem nearest every town dweller's heart, the acquirement of a piece of land and its cultivation. From the standpoint also of the beautification and sanitation of the dooryard and home premises, the kitchen-garden, house decoration, hygienic and economic preparation of foods and other indoor problems, the summer school makes its appeal. Young men and women who are through high school, and others undecided as to their life work, may find just the leadings in summer study which will determine their future vocation.

Railroad Rates

To those attending the summer school, the railroad companies grant a special rate of one and a third fare for the round trip, on the certificate plan, from all stations in Oregon. In order to receive the benefit of the reduction, the purchaser must pay full fare to Corvallis, *securing a receipt from the ticket agent* at the time of purchase. This receipt must be countersigned by the College secretary at Corvallis and on presentation to the ticket agent at Corvallis will secure rate of one-third fare for the return. This special rate takes effect three or four days before the opening date of the summer session and remains in force until the same

length of time after the closing date. Tickets on this plan may be secured at any time while the school is in session, and are also good for return at any time. If for any reason, receipt should not be secured at time of purchase, get train conductor's receipt, showing the form and number of your ticket. If a through ticket to Corvallis cannot be sold from your station, do not fail to get a receipt for each ticket, even if the fare be paid on the train. The reduced rate is good only within the State; if you live beyond the State line, buy your ticket to a station in Oregon and from that point to Corvallis.

Admission and Expenses

There are no entrance examinations or other educational test for admission. Students desiring college credit must do the required work and pass satisfactory examinations at the close of the session. The registration fee of five dollars and a small laboratory fee to cover the cost of material in some of the courses, are the only charges made for class instruction, and entitle the student to admission to as many courses as he cares to attend during the entire session. Private, individual lessons in music will be given at the regular price charged during the school year; students taking music only, will not pay the college registration fee.

Waldo Hall, the college dormitory, will accommodate 150 lodgers and over 200 boarders. A rate of \$3.50 per week, for board and room, has been made. The hall has all the modern conveniences, including hot and cold water in each room, and will be under the management of the regular staff. Board in private families and house-keeping rooms are also listed. Committees will meet all trains and assist students with their baggage and in finding comfortable living accommodations.

All absolutely necessary expenses for the six weeks can be kept under \$40.00 on the following basis: Board and room, \$21.00; incidentals, \$2.50; tuition, \$5.00; laundry, \$2.50; books, laboratory fees (if such courses are taken), etc., \$9.00. This may even be reduced by those who board themselves.

Recreation

On one or more evenings each week a popular lecture or entertainment will be given. Members of the faculty will present stereopticon views of the agricultural and other resources of Oregon, including its picturesque scenery. Concerts by the School of Music, twilight concerts on the campus by the Cadet Band, and other features are in preparation.

The tennis courts, baseball field, golf course, gymnasium and other recreation resources of the institution may be used by the students and instructors, free of charge. Boating on the Willamette and Mary's rivers, picnics and excursions to various points of interest, including Mary's Peak, and week-end trips to the ocean at Newport will also be available for those who desire. The social features of the Summer School are given careful attention, so they may not come in conflict with the regular work but at the same time be full of pleasure and interest. Variety and inexpensiveness may thus be assured and the proper balance preserved between work and play.

Courses of Instruction

The Summer instruction is of two general kinds; the regular college courses, reciting a sufficient number of periods per day to equal the credits of one semester; and special courses organized for needs not met by the regular instruction. For the session of 1913, nine regular courses in agriculture are offered, including Agronomy, Animal Husbandry, Dairying, Horticulture, and Poultry Husbandry. Other regular courses are given in Art, Botany, Chemistry, English, Geology, History, History of Education, Mathematics, Physics, Psychology, School Administration, School Management. Special courses are offered in Elementary Agriculture, Domestic Science, Domestic Art, Manual Training, Drawing, Music, Physical Education, Methods in Teaching, and Town and Rural Supervision, for teachers; also special courses for those not caring to teach, in Agriculture, Domestic Science, Domestic Art, Woodwork, Music, Art. Pro-

vision is also made for the admission of those not desiring college credit to the regular courses, in order that the widest possible freedom of selection may be made.

Special Illustrated Bulletin

Each spring, special circulars are issued, giving complete description of the various courses offered, statement in detail of living and other expenses, list of instructors, directions for registration, and other matter. These bulletins are illustrated with interesting views of the College campus. Copies may be obtained by addressing the director, Professor E. D. Ressler, or the Oregon Agricultural College, Corvallis, Oregon.

WINTER SHORT COURSES

For many years the Oregon Agricultural College has offered each winter one or more courses of lectures and demonstrations which have been known as Winter Short Courses. These courses have been so generally successful and have called forth so many expressions of approval from those in attendance, that the work has expanded until several courses are given in each of the following Schools:

School of Agriculture.

School of Domestic Science and Art.

School of Commerce.

School of Engineering.

Each of these courses, except the one in Mechanic Arts, which will consist entirely of practical work in the shops or in the draughting room, will consist of a series of lectures supplemented by demonstrations, and by practical exercises in the dairy, the orchard, and the various laboratories.

The work offered will be adapted to the various needs of farmers, fruit growers, dairymen, mechanics, or of women in the home. It is believed, also, that teachers who desire to prepare themselves to teach Elementary Agriculture, now required in our public schools, will find these courses decidedly helpful.

The various courses are so planned as to provide the largest amount of practical information in the short time available. The subjects to be discussed are those in which every farmer should be interested, and the aim will be to present them in the most practical manner possible. The laboratories and collections, the shops, the creamery, the orchards, the college farm, the cutting, fitting, and sewing rooms, the dining rooms and kitchens,—all offer facilities for demonstration or for practical exercises by the students attending these courses. A pleasing and profitable feature of these courses will be a series of lectures by prominent men who are qualified by successful experience to speak upon some particular phase of Agriculture.

Special lessons in Music may be taken by short course students at the regular rates listed under the School of Music.

Students should report to the Registrar for registration and for assignment to the various classes. The inclusive dates of these short courses are as follows: Farmers' Week, December 8-13; Winter Short Courses, January 5 to January 31. A list of boarding and lodging places may be consulted at the office of the Y. M. C. A.

No entrance examination or other educational test will be required; but no one will be received who is less than sixteen years of age. Over fifteen hundred men and women registered in these courses in 1911, their ages ranging from sixteen to over seventy-five.

There will be no fees whatever for attending the exercises of Farmers' Week. Those who attend the other courses will be expected to pay a registration fee of \$1.00. In addition, students who elect certain courses will be expected to pay small fees, to cover the cost of materials used, as indicated in the following list:

	Fees	Deposits
Apple Packing	\$ 2 50	\$
Basketry	1 50	
Blacksmithing	3 00	
Dairying	1 00	2 00
Dressmaking	25	
Food Preparation (Invalid)	2 00	
Food Preparation (Simple)	3 00	
Millinery	50	
Plant Propagation	50	
Pruning, Advanced	50	
Spraying Laboratory	50	
Woodworking	3 00	

Board and lodging may be had in Corvallis at \$4.50 to \$6.00 per week.

RAILROAD RATES. The railroad companies grant a rate of one and one third fare for the round trip on the usual certificate plan.

A circular descriptive of all Short Course work will be issued about November 1, and may be obtained by addressing the Registrar, Oregon Agricultural College, Corvallis, Oregon.

SCHOOL OF AGRICULTURE

The School of Agriculture offers to its Short Course students instruction in the following courses, viz.: Agronomy, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Horticulture, and Crop Pests. In addition to these courses, students are advised to take advantage of the courses in Rural Economics which are offered in the School of Commerce, as well as the course in Rural Highways, in the School of Engineering.

Something of the nature of the work is indicated in the following program of a single day's lectures as given during January, 1913. For more detailed information regarding these courses write for the descriptive circular mentioned above.

TUESDAY, JANUARY 28, 1913.

A. M

8-9. Principles of Fruit Growing.

C. I. Lewis.

Dairy Herd Management.

E. R. Stockwell.

Irrigation Farming.

W. L. Powers.

9-10. Soil Fertility.

H. D. Scudder.

Commercial Vegetable Growing.

A. G. Bouquet.

Landscape Gardening.

A. L. Peck.

Anthraxnose of Loganberry and other Cane Fruit Diseases.

H. S. Jackson.

10-11. Cabbage and Cauliflower Insects.

A. L. Lovett.

Vegetable Marketing.

A. G. Bouquet.

Flower Forcing.

A. L. Peck.

- 11-12. Principles of Fruit Growing.
C. I. Lewis.
Farm Machinery.
E. M. D. Bracker.
Swarms and Swarming.
H. F. Wilson.
- 10-12. Sheep Judging.
E. L. Potter.
- P. M.
- 1-2. Farm Management.
H. D. Scudder.
- 2-3. Oregon Seed Crops.
G. R. Hyslop.
- 3-4. Mutton and Wool Production.
E. L. Potter.
Farm Drainage.
W. L. Powers.
- 4-5. Breeds of Sheep.
G. R. Samson.
- 2-5. Orchard Practice (Sec. 1).
R. W. Allen.
Spraying (Sec. 2).
V. R. Gardner.
Plant Propagation (Sec. 3).
F. C. Bradford and E. J. Kraus.
Fruit Packing (Sec. 4).
F. R. Brown.
Orchard Economics.
C. I. Lewis.
- 8-9. The 1912 Apple Market.
E. H. Shepard, Editor "Better Fruit."

The work is so arranged that each hour of the day lectures may be heard and demonstrations witnessed on special Agricultural phases. The work in the other schools is similarly arranged.

FARMERS' WEEK

The exercises of Farmers' Week will begin Monday noon, December 8, and will close Saturday noon, December 13. They will be conducted somewhat upon the plan of an extended farmers' institute and will consist principally of lectures, supplemented by such demonstrations and practical exercises as are made possible by the equipment of the College and Experiment Station. The aim of the course will be to give to those in attendance the largest possible amount of information regarding the principles of successful agricultural and horticultural practices. The lectures and demonstrations by the various members of the faculty will be supplemented by one or more lectures each day by some of the most successful men in the State.

DOMESTIC SCIENCE AND ART

These courses are designed for all women who are interested in the practical and scientific working out of household problems, and who are unable to avail themselves of a regular course in Domestic Science. Many agricultural men and their sons, yearly take advantage of the Short Courses which deal with the problems of the farm, such as feeding of cattle, judging of corn, study of soils, etc. It is to meet the demand of Oregon women who are interested in the correct feeding of the family, the judging and selection of material used in the home, and study of sanitary conditions which lead to the health, comfort and happiness of the family, that this course has been established, and is to be carried on.

FOOD PREPARATION. This course deals with the subject of foods and food preparation in its scientific and economic aspect. It is the study of the nutritive principles as they are found in various foods, and the method of cooking foods to retain those principles in digestive form; serving of food in simple and attractive form; economy of money, time, and labor being the watchword.

SPECIAL FOOD PREPARATION. This course consists of the selection and preparation of foods for children of different ages, adults in active life, the aged, and invalids.

HOME MANAGEMENT.—

1. General health and welfare of the home.
 - (a) Economy of time, labor and income.
 - (b) Sanitation of the home.
 - (c) Home nursing.

NOTE.—These courses have been planned to meet the needs of those who have had previous work as well as those who are entering for the first time.

PLAIN SEWING. This course is planned for those women wishing instruction in the economical purchasing and making of household linens and underwear; the mending and renovating of old garments usually found in all households; the drafting of patterns for underwear to the students's own measurements, together with the practice of interpreting and using purchased patterns.

All women are eligible to this course.

DRESSMAKING. This course offers instruction in the principles of dressmaking; the taking of accurate measurements; the drafting and use of patterns; the choosing and economical cutting of materials; the making of at least one dress, with special emphasis on artistic color combinations and suitable design.

Tests will be made showing the adulterations of textiles; and simple methods of detecting the adulterations in dress materials will be given.

This course is given for those women who have had experience in sewing and dressmaking.

MILLINERY. Demonstrations, discussions, and manual work. Renovations of millinery materials will be taught; hence it is advisable that all women desiring to take this course should bring at least one hat from home to be used for this part of the work.

Desire to enter this class should be made known to the department not later than December 20.

ENGINEERING AND MECHANIC ARTS

MECHANICS, FARMERS, AND OTHERS. It is the purpose to teach the subjects offered in a straightforward, practical manner which can be readily grasped and understood by farmers, mechanics, and others who have had only the advantages of a common school education.

WOODWORKING. Considerable latitude will be allowed in choosing the particular line of work desired in this department as set forth under the following headings:

(a) A course for those not familiar with the care and handling of tools. This course affords instruction in the correct methods of using, sharpening, and caring for the carpenter's bench and its equipment. The work is exemplified by exercises in planing, sawing, chiseling, and the construction of useful articles of furniture.

(b) The Steel Square and Its Use. This work includes laying out rafters, braces, stairs, and other work with the steel square. Lectures will be given on the use of the square, after which the actual construction of work will be undertaken by the student.

(c) Those already familiar with the use of bench tools may obtain instruction in machine work, such as band-sawing, jig-sawing, wood-turning, the care and management of wood-working machinery.

(b) Instruction in the use of paints, stains and varnishes.

BLACKSMITHING. Two lines of work are offered in blacksmithing:

(a) Making repairs on machinery, tools, and farm implements. Students with no previous knowledge of blacksmithing are taught how to build and manage a forge fire; how to draw, bend, upset, forge, and weld iron; how to make chains, clevises, hooks, gate-hinges, whiffletrees and neck-yoke irons, and other useful articles.

(b) A course in working and welding steel for those with some general knowledge of blacksmithing. This course includes a study of the different grades of steel; the effect of heat treatment on the quality and temper of steel; the use of the color scale in tempering; and finally the forging, dressing, and tempering of steel tools.

COMMERCE

COMMERCIAL WORK. To meet the demand for a short, practical business course, the work outlined below will be offered under the same conditions and entrance requirements as other winter courses.

BOOKKEEPING. This course will embrace the fundamental principles of double entry bookkeeping. It will be made strictly practical and only sufficient theory will be introduced to give the student a firm foundation for his work. The basis of the work will be a study of a model general store equipped with the latest labor-saving methods of bookkeeping and office practice. Two laboratory periods daily.

BUSINESS ARITHMETIC. In connection with the course in bookkeeping, the instructor will review the fundamental processes of business arithmetic for the benefit of those who need it.

COMMERCIAL LAW. The course in Commercial Law will begin with the thought that there are certain fundamental principles of commercial law with which every one should be familiar, and will include the following important subjects: Property, contracts, negotiable instruments, interest and usury, bailment, agency and partnership, and real estate. Three recitations per week.

BUSINESS FORMS AND LETTER WRITING. The purpose of this course will be to familiarize the student with various forms used in general business practice. Exercises will be required illustrating both principle and practice in a clear, simple understandable manner. In the work on letter writing the correct form, wording, and general arrangement of the business letter will be taken up. Original letters, received from the most important manufacturing concerns and business houses of the United States, will be studied. Three recitations per week.

PENMANSHIP. The work in penmanship will embrace the study and practice of the best forms and style of practical business writing. The primary aim of the course will be to develop an easy, rapid, legible business hand. Two recitations per week.

TYPEWRITING. The work in typewriting will be outlined to suit the requirements of the individual student. The beginner

will be taught the correct method of fingering, the uses of the various parts of the machine, the care of the machine, manifold-
ing, and the correct arrangement of the typewritten letter or form.

FARM ACCOUNTING. A complete analysis of farm accounts by different methods in which simplicity, accuracy, and labor-saving are emphasized; household and personal accounts; cost accounting and special records; cost of production; special cost records; labor records; milk records; poultry records; etc.; the farm plot, office methods; business organizations; business correspondence and business forms. Two lectures; two recitations per week.

RURAL LAW. The general principles of common and statutory law are discussed and explained; special phases of law affecting the farm, such as titles to real estate, deeds, mortgages, county records, etc.; landlord and tenant; eminent domain, and right-of-way; water rights and boundaries; laws governing shipping, insurance, banking, etc., court procedure. Two lectures.

RURAL ECONOMICS. The fundamental principles of production, distribution, and exchange with special reference to rural life. Rural labor problems, farm finance, legislative problems affecting rural life, co-operative organizations, marketing products, advertising, the economics of machinery, transportation, etc. Three lectures.

ROSTER OF OFFICERS AND NON-COMMISSIONED OFFICERS

COMMANDANT AND STAFF.

Commandant.....	P. J. Hennessey, 1st. Lieut. 15th U. S. Cavalry
Asst. Comdt. 1st Sergeant.....	Chas. Reynolds, U. S. Army Ret'd
Captain.....	O. G. Reeves, Inspector
2nd Lieutenant.....	J. C. Bonner, Aide de Camp
Sergeant Major.....	F. Young
Ord. Sergeant	J. O. Baker

REGIMENT FIELD STAFF.

Colonel.....	C. P. Moffitt	Sgt. Maj.....	W. R. Dallas
Lieut. Col.....	C. N. Anderson	Comsy. Sgt.....	R. R. Hammersley
Capt.....	R. T. McKee, Adjt.	Q. M. Sgt.....	C. W. Edwards
Capt.....	W. H. Dunham, Q. M.	Color Sgt.....	H. D. Foster
Capt.....	R. B. Thompson, Comsy.	Color Sgt.....	W. H. Foster

BAND.

Chief Mus.....	E. Woodcock	Corporal.....	R. C. Day
Drum Major.....	H. S. Walters	Corporal.....	P. T. Wagner
Prin. Mus.....	O. W. James	Corporal.....	R. D. Kennedy
Chief Trump.....	G. F. Hess	Corporal.....	C. Hardman
Sergeant.....	A. C. Archbold	Corporal.....	R. Akers
Sergeant.....	F. L. Strang	Corporal.....	L. F. Anderson
Sergeant.....	J. L. McGinnis	Corporal.....	W. L. Luxton

FIRST BATTALION.

Major.....	G. D. C. Cronemiller	Sgt. Major.....	W. B. Anthony
1st Lieutenant.....		2nd. Lieutenant	
.....	C. A. Dickey, Adjt.	..	C. L. Robinson, Q. M. & Comsy.

COMPANY A.

COMPANY B.

Captain.....	F. W. Smith.....	L. D. Porter
First Lieutenant.....	L. F. Cronemiller.....	M. C. Hayes
Second Lieutenant.....	F. E. Neer.....	H. Odean
First Sergeant.....	H. W. Siefert.....	P. E. Freydig
Sergeant.....	L. J. Allen.....	B. A. Eddy
Sergeant.....	F. G. Pelland.....	C. E. Oakes
Sergeant.....	R. Magness.....	M. A. Baker
Sergeant.....	O. Balhorn.....	C. E. Berry
Corporal.....	C. L. McFadden.....	C. P. Venstrand
Corporal.....	N. L. Tartar.....	H. C. Gilbert
Corporal.....	H. W. Russell.....	W. M. Macpherson
Corporal.....	W. R. McAlister.....	H. Crosby
Corporal.....	L. E. Wahlberg.....	J. F. Williams

COMPANY C.

COMPANY D.

Captain.....	G. C. Jones.....	A. J. Wilson
First Lieutenant.....	P. M. Rinearson.....	F. C. Jernstead
Second Lieutenant.....	M. P. Cook.....	G. Krause
First Sergeant.....	F. M. Miller.....	D. R. Smith
Sergeant.....	O. B. Stauff.....	L. E. Emery
Sergeant.....	B. F. Horning.....	R. E. Shinn
Sergeant.....	G. R. Thomas.....	J. I. Roberts
Sergeant.....	G. T. Wolff.....	O. B. Hayes
Corporal.....	R. Livingstone.....	F. P. Amort
Corporal.....	A. T. Fletcher.....	F. A. Holmes
Corporal.....	H. L. Hubbard.....	J. A. Crawford
Corporal.....	J. L. Taylor.....	F. C. Martin
Corporal.....	L. G. O. Gentner.....	C. E. Schuster

SECOND BATTALION.

Major.....W. L. Dutton 2nd Lieutenant.....
 1st. Lieutenant..... E. E. Horning, Q. M. & Comsy.
 F. M. Harrington, Adjt. Sergeant Major....V. A. Rawson

COMPANY E.

COMPANY F.

Captain.....	G. G. Godfrey.....	R. Cruitt
First Lieutenant.....	S. J. Damon.....	L. E. Johnson
Second Lieutenant.....	E. B. Loken.....	W. K. Peery
First Sergeant.....	J. Olsen.....	G. M. Stambach
Sergeant.....	R. S. Blackden.....	H. W. Clough
Sergeant.....	R. G. Chenault.....	G. P. Johnson
Sergeant.....	V. E. Weber.....	C. J. Williamson
Sergeant.....	W. O. King.....	C. Clarke
Corporal.....	M. H. Jordan.....	F. W. Schreiber
Corporal.....	W. R. Siler.....	A. A. Amort
Corporal.....	E. W. Bartruff.....	A. Cole
Corporal.....	H. M. Lamb.....	G. H. Loughery
Corporal.....	F. T. Leonetti.....	J. F. Groce

COMPANY G.

COMPANY H.

Captain.....	G. M. Montgomery.....	D. B. Hogan
First Lieutenant.....	R. J. Anderson.....	J. E. Norton
Second Lieutenant.....	D. Eddy.....	I. T. A. Rice
First Sergeant.....	H. I. Padgham.....	H. A. Schoth
Sergeant.....	C. A. Starker.....	E. S. Wisdom
Sergeant.....	T. A. Ellestead.....	M. Moore
Sergeant.....	V. H. Stauff.....	J. C. Shirley
Sergeant.....	F. O. Suffron.....	M. Wilkins
Corporal.....	E. B. Krantz.....	L. L. Laythe
Corporal.....	H. G. Schreiber.....	J. P. Fairhurst
Corporal.....	J. W. McClaren.....	I. Betzel
Corporal.....	A. L. Olmstead.....	L. C. Schram
Corporal.....	R. B. Case.....	H. W. Weaver

THIRD BATTALION.

Major.....	E. T. Pierce	2nd Lieutenant.....	
1st Lieutenant		J. H. Hallock, Q. M. & Comsy.	
.....	O. B. Shattuck, Adj.	Sgt. Major.....	A. K. Andrews

COMPANY I.

COMPANY K.

Captain.....	G. C. Kelly.....	L. D. Tyner
First Lieutenant.....	D. C. Howard.....	R. M. Howard
Second Lieutenant.....	W. W. Howard.....	A. O. Mangold
First Sergeant.....	R. B. Boals.....	S. A. Covell
Sergeant.....	M. R. Hoff.....	J. W. Chambers
Sergeant.....	C. L. Hill.....	G. H. Roberts
Sergeant.....	A. H. Kuhnhausen.....	H. C. Gambee
Sergeant.....	W. H. Brown.....	H. F. Stoneberg
Corporal.....	W. J. Koenig.....	J. E. Muck
Corporal.....	W. H. Stewart.....	D. C. Mosby
Corporal.....	J. D. Meyers.....	C. C. Calkins
Corporal.....	G. F. Chambers.....	H. I. Savage
Corporal.....	J. B. Hukill.....	J. A. Straugham

COMPANY L.

COMPANY M.

Captain.....	B. H. McNamee.....	L. H. Kistler
First Lieutenant.....	C. N. Miller.....	E. J. Weber
Second Lieutenant.....	F. W. Kehrli.....	B. B. Irving
First Sergeant.....	K. R. Ferguson.....	A. F. Mason
Sergeant.....	C. M. Wilcox.....	W. B. Gardner
Sergeant.....	J. W. Moore.....	H. S. Babb
Sergeant.....	R. W. Arens.....	A. E. Mills
Sergeant.....	R. J. Bowers.....	A. Frank
Corporal.....	B. C. Culver.....	R. J. Wood
Corporal.....	A. L. Lindsey.....	E. F. Crouchley
Corporal.....	M. F. Hathaway.....	L. A. King
Corporal.....	F. H. Struble.....	A. C. McCormick
Corporal.....	A. E. Zwicker.....	S. J. Milliken

FORENSIC HONOR ROLL**INTERCOLLEGIATE ORATOR.**

G. R. Hoerner.

INTERCOLLEGIATE DEBATERS.

A. R. Chase.

C. L. Hill.

G. R. Hoerner.

F. McCabe.

H. M. Miller, Alternate.

CHAMPION INTERCLASS ORATOR.

Nao Uyei, Freshman.

CHAMPION IN INTERCLASS DECLAMATION.

Miss Kareen Hansen, Freshman.

CHAMPIONS IN INTERCLASS DEBATE.

G. R. Hoerner	} Freshmen.
F. McCabe	
F. J. Dietsch	

CATALOGUE OF STUDENTS

(The following abbreviations are used to indicate the course in which the student is registered and the classification within the course: Agri., Agriculture; C. E., Civil Engineering; Com., Commerce; D. S., Domestic Science and Art; E. E., Electrical Engineering; For., Forestry; M. A., Mechanic Arts; M. E., Mechanical Engineering; Min., Mining Engineering; Phar., Pharmacy; Fr., Freshman; Soph., Sophomore; Jr., Junior; Sr., Senior; F. Sec., First Year Secondary; S. Sec., Second Year Secondary; Opt., Optional; Spec., Special; First Yr., first year of Pharmacy short course; Sec. Yr., second year of Pharmacy short course.)

GRADUATE STUDENTS

<i>Name</i>	<i>Course</i>	<i>Home Address</i>
Allinger, Harry Wesley..... (University of Missouri)	Agri.....	Corvallis
Applewhite, Mrs. Alice Hill— (O. A. C.)	Agri.....	Corvallis
Arbuthnot, Samuel Hubbell..... (O. A. C.)	Agri.....	Corvallis
Barss, Alden F..... (Cornell University)	Agri.....	Rochester, N. Y.
Belknap, John Harrison..... (O. A. C.)	M. E.....	Corvallis
Bonner, Sadie..... (O. A. C.)	D. S.....	Corvallis
Brown, Frank Ross..... (O. A. C.)	Agri.....	Corvallis
Chambers, Lincoln Beaumont..... (O. A. C.)	M. E.....	Corvallis
Copson, Godfrey Vernon..... (O. A. C.)	Agri.....	Grand Rapids, Mich.
Dobell, Lila Grace..... (O. A. C.)	D. S.....	Corvallis
Dolde, William Earl..... (Oklahoma Agricultural College)	M. E.....	Guthrie, Okla.
Evans, Merrill Osgood..... (University of California)	Agri.....	Corvallis

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Groves, Edna..... (O. A. C.)	D. S.	Corvallis
Hand, Ford A..... (O. A. C.)	Phar.	McMinnville
Harris, Edna Marie..... (O. A. C.)	Phar.	St. Helens
Haskell, William Dexter..... (O. A. C.)	M. E.	Corvallis
Leedy, Alice..... (O. A. C.)	D. S.	Sherwood
Lewis, Harold Mayo..... (Yale University)	Agri.	Somerville, Mass.
Lilly, Gertrude E..... (O. A. C.)	Phar.	Corvallis
Pratt, Hiram Eldridge..... (O. A. C.)	Agri.	Boston, Mass.
Ralston, Glancy Sherman..... (Colorado Agricultural College)	Agri.	Paradise, Calif.
Sitton, Otto..... (O. A. C.)	Agri.	Carlton
Spurrier, Odith Kenelworth..... (O. A. C.)	M. E.	Guthrie, Okla.
Starring, Clarence Cecil..... (North Dakota Agri. College)	Agri.	Lead, North Dakota
Thomson, Henry Lyon..... (Occidental College)	Agri.	Grants Pass
Tufts, Warren Porter..... (University of California)	Agri.	Berkeley, Calif.
Wilson, Harley Frost..... (Colorado Agricultural College)	Agri.	Corvallis
Wilson, Mary A..... (O. A. C.)	D. S.	Gresham

UNDERGRADUATE STUDENTS

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Abbott, Arthur Evelyn.....	Agri. Spec.	Vernon, B. C.
Ackerman, Fred Edward.....	Phar. Sec. Yr.	Portland
Adams, Mary Etta.....	D. S. Soph.	Corvallis
Addison, Nettie.....	Com. Fr.	Lorane
Affolter, Walter.....	For. S. Sec.	Neskowin
Akers, Robert.....	M. A. S. Sec.	Portland
Albers, Helmuth Harold.....	Phar. Sec. Yr.	Shoshone, Idaho
Albert, Paul.....	Agri. Fr.	Seattle, Wash.
Alderson, Edward Regiland.....	Agri. Spec.	Vernon, B. C.

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Alderton, Ada	D. S. Fr.	Portland
Aldrich, Elias Hugh	For. Fr.	Lebanon
Aldrich, Winnifred Reba.....	Opt.	Corvallis
Allen, Ethel Edna.....	D. S. Soph.	Corvallis
Allen, Ethel Miriam.....	D. S. Sr.	Bend
Allen, Fred	M. A. F. Sec.	Burns
Allen, Harold B.	Phar. First Yr.	Lents
Allen, Leonard J.	Agri. Jr.	Cove
Allinger, Mrs. Grace Smith.....	Op ⁺	Corvallis
Allingham, William David.....	M. E. Fr.	Warmspring
Allworth, Edith	D. S. Jr.	Crawford, Wash.
Allworth, Edward C.	Com. S. Sec.	Crawford, Wash.
Allworth, Helen	D. S. Jr.	Crawford Wash.
Alspaugh, Roy Ware.....	Agri. Sr.	Barton
Amesbury, Ruth M.	D. S. Fr.	Portland
Amort, Albert Alexander.....	C. E. Fr.	Corvallis
Amort, Frank Peter.....	C. E. Soph.	Macleay
Amort, Paul.....	M. E. Fr.	Albany
Anderson, Carl Nathaniel.....	M ⁱⁿ . Sr.	Portland
Anderson, Edmund	For. Fr.	Albany
Anderson, Helen B.	D. S. Fr.	Portland
Anderson, Isaac Milton Compton	Agri. Jr.	Drewsey
Anderson, Joan	Opt.	Medford
Anderson, Louis Frederic.....	Agri. Jr.	Newberg
Anderson, Olaf Ewart.....	M. A. F. Sec.	Astoria
Anderson, Roy J.	E. E. Sr.	Tillamook
Anderson, Verlie	D. S. Fr.	Corvallis
Andresen, Olaf	Agri. S. Sec.	Vancouver, Wash.
Andrews, Allan Kendall.....	C. E. Jr.	Medford
Andrews, Corliss Burton.....	Agri. Fr.	Oregon City
Anthony, Marie	D. S. Fr.	McMinnville
Anthony, Walter Edward Burton	C. E. Jr.	Carmel by the Sea. Calif.
Antle, Mildred	D. S. Fr.	Medford
Archbold, Alston Conway.....	E. E. Jr.	Hillsboro
Archibald, Harold Gilbert.....	C. E. Fr.	Albany
Archibald, Viva.....	D. S. Jr.	Albany
Arens, Ralph Waldo.....	Agri. Soph.	Hood River
Armstrong, Fay	D. S. Fr.	Corvallis
Armstrong, Jay Manwaring.....	Agri. Jr.	LaPeer, Mass.
Arnold, Alice	D. S. Fr.	Gladstone
Asplund, John Walter.....	E. E. Sr.	Marshfield
Atherton, Leona	D. S. Soph.	Corvallis
Ault, Byrd Moore.....	Agri. Fr.	Enterprise

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Ault, Indiana Moore	D. S.	Fr.	Enterprise
Ausmus, Ormond	Com.	Fr.	Lawen
Ayers, Auldy Augustus	For.	Fr.	Lacomb
Babb, Harold Sidney	E. E.	Jr.	Portland
Babbitt, Richard Carrick	C. E.	Fr.	Corvallis
Bohr, Alice	Opt.		Grandronde
Bailiff, Florence	D. S.	Fr.	Corvallis
Bains, Umrao Singh	E. E.	Jr.	Mahilpur, India
Baird, Alice	D. S.	Fr.	Portland
Baird, Mary Tate	Opt.		Portland
Baker, George William	Agri.	Fr.	Medford
Baker, John Oscar	C. E.	Soph.	Portland
Baker, Marshall	M. E.	Jr.	Portland
Baldwin, Lee Ernest	Phar.	First Yr.	Winlock, Wash.
Baldwin, Neil Burton	Com.	Fr.	Corvallis
Ballard, Frank L.	Agri.	Fr.	Meredith, N. H.
Ballhorn, Otto	Com.	Soph.	Woodland, Wash.
Bannister, Clyde Eugene	C. E.	Fr.	Portland
Bartholomew, Lela Mae	Opt.		Corvallis
Bartruff, Elmer Walter	Agri.	S. Sec.	Salem
Bartu, Frank	M. E.	Fr.	Crabtree
Bartu, Mylo	M. E.	Jr.	Crabtree
Bass, Chester	Agri.	Fr.	Portland
Bates, Grenville	For.	Soph.	Williamsport Pa.
Baum, Olin Huntington	Agri.	Fr.	Corvallis
Baynard, Claud Corthel	M. E.	Fr.	Creswell
Beals, Agnes	D. S.	Jr.	Silverton
Beals, Elva Lovina	D. S.	Fr.	Corvallis
Beck, James Obye	Agri.	Fr.	Boise, Idaho
Beck, Pauline	D. S.	Soph.	Corvallis
Beck, Ursula Amelia	D. S.	Jr.	Aurora
Beckett, Carl William	Agri.	Fr.	Salem
Belton, Howard Clair	Agri.	Soph	Los Angles, Calif.
Bennett, Arthur A.	M. E.	Fr.	Dallas
Bent, Crawford H.	Agri.	F. Sec.	Los Angles, Calif.
Berg, Frank Oscar	Phar.	Sec. Yr.	Astoria
Berlin, Treve	Agri.	S. Sec.	Turlock, Calif.
Bernards, Martin	Agri.	Spec.	Forest Grove
Bernstein, Leon Myer	Agri.	Sr.	Portland
Berry, Carl Evan	Agri.	Soph.	Hood River
Berry, Royal Lincoln	E. E.	Fr.	Aurora
Betzel, Charles	M. E.	Fr.	Oregon City
Betzel, Dorian	M. A.	S. Sec.	Oregon City
Betzel, Irwin L.	Phar.	Soph.	Oregon City
Bewley, Charlcia M.	D. S.	S. Sec.	Sheridan

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Bewley, Philip Mendenhall	Agri.	F. Sec.	Sheridan
Bick, Norma Gladys	D. S.	Jr.	Philomath
Biggar, H. Howard	Agri.	Spec.	Brookings, S. Dak.
Bixby, Clarence Milton	Agri.	Fr.	Freewater
Bixby, Penelope	D. S.	Fr.	Grants Pass
Blackden, Ralph Silsby	For.	Jr.	Ashland
Blackwell, Ira Lee	For.	Fr.	Aberdeen, Wash.
Blair, Bernard	Agri.	Fr.	Seattle, Wash.
Blair, Joe Earl	For.	Fr.	Seattle, Wash.
Blakely, Cecil Grant	Com.	Fr.	Glide
Blakley, Harold G.	Phar.	First Yr.	Brownsville
Blakely, Lloyd Herbert	M. E.	Fr.	Newport
Blanchard, Ralph Abel	Agri.	Sr.	Chicago, Ill.
Blascynski, Adam	Agri.	Spec.	Lodz, Russia
Blunt, Clarkson E.	Agri.	F. Sec.	The Dalles
Boals, Roy B.	E. E.	Jr.	Dallas
Boddinghouse, Emmons Richard	M. E.	Fr.	White Salmon, Wash.
Boies, Etta Philippi	Com.	Fr.	Harlan
Boies, John	M. E.	Fr.	Harlan
Boies, Thursa	D. S.	Fr.	Harlan
Bolin, Francis Gerald	Agri.	S. Sec.	Portland
Bones, D. Chesley	Opt.		Taft
Bones, John William	C. E.	Fr.	Carlton
Bonner, James Charles	Agri.	Jr.	Corvallis
Booco, Florence Irene	Opt.		Corvallis
Booth, Bertha M.	D. S.	Jr.	Portland
Boothe, Joe Miles	Agri.	Soph.	Union
Bowen, Merle Elva	D. S.	Jr.	Silverton
Bower, Hazel Harriet	Opt.		Corvallis
Bowers, Ralph J.	Agri.	Soph.	Seattle, Wash.
Bowman, Florence G.	Opt.		Pendleton
Boyed, Eva Annette	Opt.		Hood River
Boyer, Will	Min.	Fr.	Portland
Bozorth, Inez	D. S.	Fr.	Bay City
Bozorth, Levi Stephen	Agri.	S. Sec.	Amboy, Wash.
Brackett, Ethel B.	Com.	Fr.	Rufus
Brackett, Florence Marie	Com.	F. Sec.	Rufus
Bradford, Miles Thomas	M. E.	Fr.	Salem
Bradley, Blanche A.	D. S.	Jr.	Portland
Brett, Sereno Elmer	For.	Fr.	Portland
Brewster, Charles Stockton	Agri.	Sr.	Portland
Bridges, Boyd Joseph	Com.	Fr.	Oakland
Bristol, R. R.	Opt.		Portland
Bristow, Arlow Blaine	Agri.	Spec.	Pleasant Hill

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Brockman, Mildred	D. S. Fr.	Weiser, Idaho
Brown, Donald E.	Agri. Fr.	Oregon City
Brown, Ellis Elmer	Agri. Soph.	New Era
Brown, Harry Calvin	Com. S. Sec.	Smith River, Calif.
Brown, Mae C.	D. S. S. Sec.	New Era
Brown, Nina	D. S. Fr.	Portland
Brown, Robert Walton	Com. Sr.	Drewsey
Brown, Waldo Frank	Agri. Fr.	New Era
Brown, William H.	Agri. Soph.	Portville, N. Y.
Browning, Pansy	Com. F. Sec.	Hoskins
Brownlee, Earl Cranston	Com. Spec.	Aguascalientes, Mexico
Brunner, Henry Walter	For. Fr.	Bellevue, Pa.
Brunquist, Edythe	D. S. Jr.	Hood River
Bryant, Claude H.	E. E. Fr.	Gaston
Buchanan, Elizabeth May	D. S. Sr.	Corvallis
Burdick, Bert Chas.	Phar. Spec.	Portland
Burns, Ralph	Agri. Fr.	Taulatin
Butler, Alice	D. S. Jr.	Mapleton, Iowa
Butts, Fred Edwin	Com. Soph.	Parkplace
Butterfield, Albert E.	Agri. Spec.	Portland
Cadwell, Jennie	D. S. Jr.	Seattle, Wash.
Caldwell, Jonathan Edward	M. A. F. Sec.	Hensall, Canada
Calkins, Claude Clark	Agri. Spec.	Airlie
Calkins, Nelta	D. S. S. Sec.	Airlie
Callison, Annabelle	D. S. Jr.	Aberdeen, Wash.
Campbell, Edna	D. S. F. Sec.	Oakbar, Calif.
Campbell, George Kenneth	Agri. S. Sec.	Honolulu, Hawaii
Candfield, M. E.	Com. Sr.	Albany
Cardinell, Horace Albert	Agri. Fr.	Portland
Carlson, Evelyn	Com. Fr.	Portland
Carlson, Ruth	Com. Fr.	Portland
Carlson, Vida	D. S. Fr.	Portland
Carnell, Edwin H.	Agri. Fr.	Medford
Carnes, Homer Maxwell	Agri. Sr.	North Powder
Carnie, Norval Craigie	Agri. S. Sec.	Chicago, Ill.
Carogal, Joseph A.	Agri. Spec.	Brooklyn, N. Y.
Cartan, Hazel	D. S. Jr.	Corvallis
Case, Richard Burton	Agri. Soph.	Portland
Cassels, Ada Evlyn	Opt.	South Bend, Wash.
Cathey, Alice Marie	D. S. Sr.	Corvallis
Catterlin, Merlin	Agri. Fr.	Langlois
Chamberlin, Everett	M. A. S. Sec.	Lebanon
Chamberlin, Willard Joseph	For. Soph.	Albuquerque, N. Mex.
Chambers, George Fredrick	C. E. Fr.	Newberg
Chambers, Joseph William	Agri. Soph.	Newberg

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Chambers, Minnie Eva.....	Opt.		Eugene
Chand, Ram	M. A. F. Sec.		Village Nagar, India
Chandler, Earl Charles.....	Agri. Sr.		Sheridan
Chandler, George Leo.....	Agri. Fr.		Rogue River
Chapman, Charles Lloyd.....	Min. Jr.		Sheridan
Charley, Floyd Sharp	Agri. F. Sec.		Brownsboro
Chase, Arthur R.	Agri. Sr.		Corvallis
Chase, Ernest	For. Soph.		Corvallis
Chase, Harold	Agri. Spec.		Eugene
Chase, Lucile	D. S. Fr.		Salem
Chenault, Ralph Garfield.....	Agri. Soph.		LaGrande
Cheney, Maribel Whitman.....	D. S. Jr.		Coupeville, Wash.
Cheney, Willard Colfax.....	M. E. Soph.		Coupeville, Wash.
Chrisman, Robert John.....	For. Soph.		Danville, Ky.
Chrisman, Vida R.	Phar. Sec. Yr.		Silver Lake
Chu, Tsowa	For. Fr.		Canton, China
Ckashein, Armen	Agri. Fr.		Diarbekir, Armenia
Clark, Arthur Clarence.....	C. E. Soph.		St. Johns
Clark, Carrie E.	D. S. Fr.		Waitsburg, Wash.
Clark, Cederic	Com. Soph.		Canyon City
Clark, Gladys Mary	Opt.		Hood River
Clark, Helen	D. S. Sr.		Grants Pass
Clarke, William E.	For. Spec.		Newberne. N. C.
Clausen, Arnold Alvin.....	C. E. Soph.		The Dalles
Clough, Huron Willoughby.....	C. E. Jr.		Canyonville
Clough, Mary Beatrice	Opt.		Tumwater, Wash.
Cochran, Paul Henry	C. E. Soph.		St. Johns
Coe, Wayne Walter	Agri. Fr.		Portland
Cohen, Benjamin B.	Agri. Fr.		Smiclar, Russia
Cohen, Leeser Raphael.....	E. E. Sr.		Portland
Cole, Albert B.	Agri. Spec.		Pasadena, Calif.
Cole, Grace E.	D. S. Fr.		Portland
Coleman, C. P.	Opt.		Templeton
Colvig, Vance DeBar.....	Opt.		Medford
Conklin, Evelyn	D. S. Fr.		Grants Pass
Connell, Dorothy M.	Opt.		Portland
Conner, Mary	Opt.		Albany
Conner, Raymond M.	C. E. Soph.		Albany
Cook, Elsie	D. S. Fr.		Peak
Cook, Jack Chandler	M. E. Jr.		Portland
Cook, Mortimer Parker	Agri. Jr.		Portland
Coolidge, Dorothy	D. S. Spec.		Corvallis
Coolidge, Jay Francis	E. E. Soph.		Corvallis
Coon, Abbie R.	D. S. Soph.		Corvallis
Cooper, Benjamin Harrison.....	Agri. Sr.		Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Cooper, Clarence	M. A. S. Sec.		Chemawa
Cooper, Hary C.	Phar. Spec.		Corvallis
Cooter, John E.	Agri. Sr.		Cottage Grove
Corbin, Kathryn	Com. Fr.		Portland
Cordiner, Peter Clarence	Phar. First Yr.		Astoria
Corkins, Vernon Granding	E. E. Jr.		Enterprise
Coral, Leland David	M. E. Fr.		Corvallis
Cornwall, Thomas	Agri. S. Sec.		Bandon
Cottell, Charles Campbell	Phar. Sec. Yr.		Portland
Coulter, Olive E.	D. S. Fr.		Corvallis
Coursen, Raymond Eugene	Opt.		Portland
Covell, Spencer Albert	M. E. Jr.		Corvallis
Cowgill, Helen Julia	D. S. Sr.		Corvallis
Cox, Helen Madeline	D. S. Fr.		Hood River
Cox, Walter Judson	Com. Fr.		Burton, Ia.
Craig, Asa Paul	Agri. Soph.		Enterprise
Crain, Julia Diesten	D. S. Soph.		Biggs, Calif.
Crain, William Wallace	Agri. Fr.		Biggs, Calif.
Craine, Erma Melinda	D. S. Fr.		Bandon
Cramer, Floyd Samuel	Com. F. Sec.		Hitchcock, S. Dak.
Crane, Fred Hovey	Agri. F. Sec.		Cleone
Crawford, James Arthur	For. Soph.		Burlington, Iowa
Crawford, Lucy Adelle	D. S. Sr.		Laidlow
Creighton, Leland David	M. E. Fr.		Portland
Crockatt, Edith L.	D. S. Fr.		Pendleton
Cronemiller, Guy D.	E. E. Sr.		Lakeview
Cronemiller, Lynn F.	For. Jr.		Lakeview
Crosby, Hartzell	Agri. Soph.		Sherwood
Crosby, Maud	D. S. Soph.		Sherwood
Crouchley, Ernest F.	For. Fr.		Corvallis
Cruit, Rowley	Min. Sr.		Weller
Crum, McKinley	Agri. F. Sec.		Olex
Crumley, Elmer	Agri. Fr.		National City, Calif.
Culver, Benjamin C.	For. Soph.		The Dalles
Crummings, Arthur Edwin	Agri. Soph.		Salem
Currey, Hiram Meyrick	Agri. Fr.		Baker
Curtis, Ernest Walton	Agri. Sr.		Claremont, Calif.
Curtis, Mary Bushe	Opt.		Whitehorse, Yukon Ter.
Curtis, Roland Edward	Agri. Soph.		Claremont, Calif.
Cusick, Mrs. Anna	D. S. Sr.		Medford
Daley, Opal Viola	Phar. Sec. Yr.		Medford
Dallas, Willis Robert	Agri. Soph.		Kist
Damewood, Clifford Elsworth			
.....	Agri. F. Sec.		Cottage Grove
Damon, Ruth Columbia	D. S. S. Sec.		Newport

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Damon, Sumner John	Agri.	Jr.	Ferndale, Calif.
Darling, Charles Vador	C. E.	Soph.	Portland
Darling, Corliss Arthur	Agri.	Spec.	Klamath Falls
Darst, Susie	D. S.	Fr.	Corvallis
Davidson, Leffie	D. S.	Fr.	Portland
Davidson, Mabel	D. S.	F. Sec.	Ione
Davis, Charles Harold	Com.	Soph.	Corvallis
Davis, Durrell Crosby	Com.	Fr.	Independence
Davis, George Nash	Phar.	Sec. Yr.	Silverton
Davis, Robert Ray	M. E.	Jr.	Hillsboro
Davisson, Margaret	D. S.	Fr.	Central Point
Dawson, Keneth Fenton	M. A.	F. Sec.	Clatsop
Day, Ralph Coulter	C. E.	Soph.	Portland
Denny, Edward Bell	Agri.	Fr.	Newark, N. J.
Deutsch, Henry C.	For.	Soph.	Portland
Devenport, Adella	D. S.	Sr.	Corvallis
Dewey, George Garrington	Agri.	Fr.	Corvallis
Deyoe, Harold Leroy	E. E.	Fr.	Portland
Dickerson, Earl Jesse	Agri.	Fr.	Parma, Idaho
Dickey, Chester Allan	Com.	Jr.	Molalla
Dietsch, Frank John	Agri.	Fr.	Days Creek
Dinges, Grace May	D. S.	Jr.	Corvallis
Dobell, Roland	Com.	Fr.	Corvallis
Doerner, Armin Meredith	Agri.	Fr.	Grants Pass
Doods, Wheeler E.	Min.	Fr.	Portland
Donaldson, Olga Hope	D. S.	F. Sec.	Chinook, Wash.
Donovan, Christopher	Agri.	Spec.	Dublin, Ireland
Doolittle, Lydia	D. S.	Fr.	Corvallis
Doolittle, Maida	D. S.	Fr.	Corvallis
Douglas, Nina	Com.	F. Sec.	Corvallis
Dow, William Neal	For.	S. Sec.	Astoria
Downing, Hazel	D. S.	S. Sec.	Kingston
Doxsee, Earl DeWitt	Agri.	Fr.	Brownsville
Doyle, Willis Burlington	For.	Fr.	Portland
Drilling, Carl Fred	C. E.	Fr.	Warrenton
Driver, Frances Estha	Com.	Fr.	Tangent
Dryden, Robert James	Agri.	S. Sec.	Corvallis
Duncan, Edgar Bruce	Agri.	Soph.	Nyssa
Dunham, William Henry	Agri.	Sr.	Portland
Dunn, Evelyn Guthry	Com.	S. Sec.	Corvallis
DuRetta, Cecil A.	M. A.	F. Sec.	Gervais
DuRetta, Francis Ralph	Agri.	F. Sec.	Gervais
Durkheimer, Sylvan F.	Com.	Jr.	Portland
Dutton, Walt L.	For.	Sr.	Lakeview
Dye, Edah M.	D. S.	Fr.	Vancouver, Wash.

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Eachus, Roy Milton	Com.	Fr. Sec.	Coquille
Eaton, Karl	Agri.	Fr.	Yamhill
Eckley, Winfield	E. E.	Fr.	LaGrande
Eddy, Benjamin A.	C. E.	Jr.	Roseburg
Eddy, Delmar	Com.	Jr.	Kings Valley
Edington, Jesse Boyd	Agri.	Sr.	Corvallis
Edwards, Connor Whealdon	Agri.	Jr.	Monroe
Edwards, Elias Jackson	Agri.	Fr.	Myrtle Creek
Edwards, Jess	Phar.	First Yr.	Sumpter
Ehrman, Harry J.	E. E.	Soph.	Junction City
Elkins, Millard Combs	Agri.	Fr.	Prineville
Ellestad, Theodore Alfred	Agri.	Soph.	Central Point
Emery, Edythe	Opt.		Corvallis
Emery, Lee Earl	For.	Jr.	Corvallis
Endres, Richard William	Agri.	F. Sec.	Seattle, Wash.
Erickson, Anton	M. E.	Fr.	Portland
Estes, Marie Genevieve Cecilia	Com.	Fr.	San Francisco, Calif.
Estes, Melville Burnham	M. A.	F. Sec.	San Francisco, Calif.
Evans, Carl Clarence	Agri.	Spec.	Waterbury, Vt.
Evans, Dorothy	Com.	Soph.	Umpqua
Evendon, James C.	For.	Jr.	Warrenton
Failing, Kate Whittesey,	Agri.	Fr.	Portland
Fairhurst, Joe Paul	For.	S. Sec.	Corvallis
Fairhurst, Nell	Com.	Fr.	Corvallis
Farwell, Fred Kenneth	Agri.	F. Sec.	Three Pines
Farmer, Oliver	Agri.	F. Sec.	Shedds
Feathers, Mabel	D. S.	Fr.	Corvallis
Feemster, Russell Emil	Opt.		Marion
Feldenheimer, Elmer	Agri.	Jr.	Portland
Feldman, Gustav	Com.	Fr.	Portland
Fellows, Lillian	D. S.	Spec.	Dallas
Fenn, Donald	Agri.	Fr.	Portland
Ferguson, Almont Hawthorn	M. A.	S. Sec.	Hood River
Ferguson, Blaine	Agri.	Sr.	Hailey, Idaho
Ferguson, Keith Robert	Com.	Jr.	Hailey, Idaho
Fiedler, Frank D.	C. E.	Jr.	Bellingham, Wash.
Fisher, Boyd F.	C. E.	Fr.	Portland
Fisher, Stella Blanche	Opt.		Port Hammond
Fisk, Carlos Ewing	Agri.	Fr.	Parma, Idaho
Fitzgerald, Gerald	Agri.	F. Sec.	Portland
Flanagan, Charles Bartlett	Agri.	Fr.	Marshfield
Flanery, Floyd B.	Phar.	Fr.	Amity
Fleckus, Edward Willis	M. A.	S. Sec.	Ashland

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Flegel, Charles	Agri.	Soph.	Portland
Fleming, Jesse Ray	Agri.	Sr.	Bakeoven
Fletcher, Allan Taylor.....	Com.	Soph.	Buell
Fletcher, Birdie E.	Com.	Spec.	Portland
Flint, John Walt	Agri.	Soph.	San Diego, Calif.
Floss, Fritz Carl	Min.	Fr.	Milwaukee
Forbis, John Franklin.....	Agri.	Soph.	Dilley
Ford, Charles Edward	Com.	Fr.	Sheridan
Forster, Fred Henry.....	C. E.	Fr.	Tangent
Foster, Harold D.	Agri.	Jr.	Seattle, Wash.
Foster, Valentine	D. S.	Fr.	Idaho Falls, Idaho
Foster, Warren Ralston.....	Com.	Soph.	Independence
Foster, Will Herman.....	E. E.	Jr.	Corvallis
Fowler, Robert Grey	Agri.	Fr.	Portland
Fox, Kenneth Lawrence.....	Min.	Fr.	Portland
Fraley, Earl John	Com.	Fr.	Ashland
Francis, George L.	Agri.	Fr.	Portland
Frank, Arthur	Agri.	Jr.	South Bend, Ind.
Frank, Herbert	Agri.	Fr.	Valley City, Ohio
Franz, Earl Alfred	Com.	Spec.	Hood River
Fraser, John Henry	C. E.	Fr.	Parkplace
Freeman, Addice Lillian.....	D. S.	Fr.	Hood River
Freitag, Boad	Agri.	S. Sec.	Freewater
French, Phoebe Caroline.....	D. S.	F. Sec.	Corvallis
French, Susan E.	D. S.	F. Sec.	Corvallis
Freydig, Paul E.	For.	Jr.	Sutherlin
Frick, Robert B.	For.	Fr.	San Francisco, Calif.
Friday, Roberta Fay.....	D. S.	Soph.	Hood River
Fridley, Callie	D. S.	S. Sec.	Klondike
Fridley, Dora	D. S.	Fr.	Klondike
Fridley, Nettie	D. S.	S. Sec.	Klondike
Frost, Carl Magnus	E. E.	Fr.	Portland
Fryer, Carl Augustus	Phar.	Soph.	Shaw
Fujihira, Yoshitaro	E. E.	Sr.	Wakayama, Japan
Fuller, Fred Audlaigh	For.	F. Sec.	Union
Funk, Arnold John.....	Com.	Fr.	Corvallis
Funk, Maude	D. S.	Fr.	Etna Mills, Calif.
Fyne, Hannah R.	D. S.	Fr.	The Dalles
Gambee, Hosmer C.	Agri.	Soph.	Corvallis
Gambee, Louis Phaon.....	Agri.	Soph.	Corvallis
Gamble, Ella	Com.	Soph.	Astoria
Garbutt, Earl Edward	M. E.	Fr.	Sheridan
Gardiner, William Benson.....	Agri.	Jr.	Colorado Springs, Colo.
Garrettson, Ernest	Agri.	S. Sec.	Sioux City, Iowa
Gates, Pearl.....	D. S.	Fr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Gaver, Andrew Poe	Agri.	S. Sec.	Petaluma, Calif.
Gaylord, Clarence Clyde	Phar.	Soph.	Halfway
Gentner, Louis G. O.	Agri.	Soph.	Portland
Gerke, Walter Henry	Agri.	Fr.	Portland
Getchell, Millie B.	D. S.	Fr.	Valley City, N. Dak.
Gibbs, James Clarence	Agri.	Sr.	Grace, Idaho
Gibson, Elise	D. S.	Fr.	Nyssa
Gilbert, Henry Clark	Agri.	Soph.	Salem
Gilbert, Lovina	D. S.	F. Sec.	Salem
Gilbert, Mahlon Bruce	Agri.	Fr.	Woodburn
Gildner, Walter Fred	E. E.	Soph.	Astoria
Glaisyer, Harold Roland	Agri.	Sr.	Forest Grove
Glaser, Elizabeth Carolyn	D. S.	Fr.	Lebanon
Glines, Halcie Williford	Agri.	Fr.	Waldport
Goble, Roy Elbert	Agri.	Fr.	Ferndale, Calif.
Goddard, Jackson F.	Opt.		Cottage Grove
Godfrey, Gaylord Gerald	Phar.	Jr.	Oregon City
Godfrey, Lena	D. S.	Fr.	Portland
Goffe, Cordelia Hawley	D. S.	Jr.	Central Point
Gooding, Joseph Hunter	Agri.	Soph.	Wilmington, Del.
Goodrich, Lee J.	Agri.	Spec.	Seattle, Wash.
Graf, Herman	M. E.	Fr.	Portland
Granlund, Charles Edwin	Com.	Jr.	Portland
Grasle, Wesley Reed	E. E.	Soph.	Milwaukee
Gray, June R.	D. S.	Sr.	Eugene
Green, Don Dudley	Agri.	S. Sec.	Parkdale
Green, John Wesley	C. E.	Fr.	Suver
Green, Louis Leo	Agri.	S. Sec.	Seattle, Wash.
Greenlee, James P.	Agri.	F. Sec.	Portland
Grimshaw, Henry Howard	Agri.	Fr.	Phoenix, Ariz.
Groce, Jack Francis	Com.	Fr.	Portland
Groce, Oliver	Com.	Fr.	Portland
Grubbe, Eugene Erle	Com.	F. Sec.	Elkton
Grubbe, Ivan	Com.	F. Sec.	Elkton
Haberman, Nick	Com.	F. Sec.	Ellensburg, Wash.
Hackett, Harold Nelson	E. E.	Fr.	Elgin
Hadrys, Frank Vincent	E. E.	Soph.	Portland
Hagey, Grove Adel	Phar.	First Yr.	Newberg
Hall, John Quincy	Com.	Spec.	Portland
Hall, Milred Augusta	D. S.	Fr.	Corvall's
Haller, Wanda	D. S.	Soph.	Telocaset
Hallock, Joseph Homer	E. E.	Jr.	Portland
Hamilton, Harry Earl	M. E.	Fr.	Portland
Harmersley, Ray Roy	M. E.	Jr.	Corvallis
Hamlin, Lucile Anna	Opt.		Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Handy, Victor Hugo	C. E.	Fr.	Medford
Hankins, Glen Alan	M. E.	Fr.	Cottage Grove
Hansen, Alfred Hugo	Agri.	Jr.	Anaheim, Calif.
Hansen, Benita Kareen	D. S.	Fr.	Corvallis
Hansen, Harold Von Stein	Opt.		Portland
Hanson, Margaret	Com.	Soph.	Corvallis
Hardman, George	Agri.	Soph.	Ontario
Hardman, Sylvia	D. S.	Soph.	Cape Horn, Wash.
Hargreaves, Arthur	Agri.	S. Sec.	Corvallis
Harlow, Charles	E. E.	Fr.	Cottage Grove
Harmon, Ruth	Agri.	Spec.	North Bend
Harriman, Arthur Absalom	E. E.	Soph.	Corvallis
Harriman, Edna Cornelius	Com.	Soph.	The Dalles
Harriman, Nellie Hanford	Com.	Soph.	The Dalles
Harrington, Frank M.	Agri.	Sr.	Creswell
Harrington, Chauncey Clifford	Agri.	Fr.	Corvallis
Harris, Earl Sorsby	Com.	Soph.	Corvallis
Harris, Evan	Agri.	Soph.	Chula Vista, Calif.
Harrison, M. Allen	Agri.	Soph.	Brownsville
Harritt, Jessie Altje	D. S.	Soph.	Salem
Harry, Earl Logan	M. E.	Jr.	Corvallis
Harry, Olive Mary	Phar.	Soph.	Corvallis
Hart, Otto Clement	M. E.	Fr.	Corvallis
Hartill, Leonard Ramsden	Agri.	Sr.	Brooklyn, N. Y.
Hartsock, Charles McFerrin	C. E.	Sr.	Albany
Hartung, Esther Jennie	D. S.	Jr.	Eugene
Hartung, Mary Elizabeth	D. S.	Sr.	Eugene
Hartzog, Clara	D. S.	Sr.	Corvallis
Hartzog, Delphia	D. S.	Fr.	Corvallis
Harvey, Corwin Satterthwaite	Com.	Fr.	Milwaukee
Harvey, Gysbert	For.	S. Sec.	Corvallis
Haseltine, Sarah	Opt.		Berkeley, Calif.
Hathaway, Marcus Francis	Agri.	Fr.	Corvallis
Hattan, Lloyd Stanley	Agri.	Fr.	St. Helens
Hauser, Emil	For.	Fr.	Siletz
Hauser, Solomon	Agri.	F. Sec.	Tygh Valley
Haw, Horace Leo	Agri.	Fr.	Pendleton
Hawkins, Annie E.	D. S.	Fr.	Toledo
Hawkins, Joe Cephus	Agri.	Fr.	Sayre, Okla.
Hawkins, Thomas Powers	Phar.	Sr.	Toledo
Hawley, Mary W.	Com.	Soph.	Corvallis
Hawley, Ruth Blanche	Com.	Jr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Hawley, Tressa Lena	Opt.	.....	Creswell
Hawley, Willa Winnifred	D. S.	Soph.	Corvallis
Hayes, Marshall Crane	For.	Jr.	Pasadena, Calif.
Hayes, Oliver Bliss	Agri.	Soph.	Pasadena, Calif.
Heath, Laura B.	D. S.	Fr.	Corvallis
Heaward, Robert Emerson	Com.	S. Sec.	Carrollton, Wash.
Henderson, Charles Albert	Com.	Fr.	Gardiner
Henderson, James A.	M. A.	S. Sec.	Weston
Henderson, William Wright	Agri.	S. Sec.	Hilo, Wawaii
Hendrick, Bertha May	D. S.	Jr.	Silverwood, Mich.
Henshaw, Ferrie	Min.	Fr.	Portland
Herigstad, Carl	Agri.	F. Sec.	Silverton
Herr, Hazel	D. S.	Fr.	Richland
Hess, George Fred	M. E.	Soph.	Corvallis
Hetzel, Harry C.	Agri.	Sr.	Madison, Wis.
Hewitt, Harry Nutting	Phar.	First Yr.	Milton
Hewitt, Henry	Agri.	Fr.	Portland
Hewitt, Marion Samuel	M. E.	Soph.	Stockton, Calif.
Heynemann, Walter Patten	Agri.	Fr.	San Francisco, Calif.
Hicks, Kreta Mae	Opt.	.....	Silverton
Highsmith, Pearl	D. S.	F. Sec.	Portland
Hill, Charles Edwin	Agri.	Fr.	Springfield, Mass.
Hill, Charles Lester	Agri.	Jr.	Berea, Ky.
Hillyard, Mary Arrissa	D. S.	F. Sec.	Gresham
Hirst, Bernard	Agri.	Fr.	Sitka, Alaska
Hirst, Percy Verne	Agri.	Fr.	Sitka, Alaska
Hittson, Carmen	Phar.	Fr.	Medford
Hobbs, Grace E.	D. S.	Sr.	Eugene
Hoerr, Carl Girlick	M. E.	Fr.	Lebanon
Hoerner, Godfrey Richard	Agri.	Fr.	Seattle, Wash.
Hofer, Marie	D. S.	Jr.	Salem
Hofer, Paul Bellon	Agri.	Fr.	Salem
Hoff, Melvin R.	Agri.	Jr.	New Era
Hoff, N. P.	C. E.	Soph.	Salem
Hogan, D. Brooks	Agri.	Sr.	Lebanon
Hogg, J. Ashton	M. E.	Fr.	Lihue, Hawaii
Holboke, Sophia M.	Opt.	.....	Corvallis
Holland, Wellington Payton	Agri.	S. Sec.	Sumpter
Holm, Dessa	D. S.	Fr.	Wenatchee, Wash.
Holmes, Elise Gabrielle	D. S.	Fr.	Enterprise
Holmes, Frederick Aram	Agri.	Soph.	Enterprise
Holt, Hazel	D. S.	Jr.	Corvallis
Holt, Margaret Richmond	D. S.	Fr.	Portland
Hooper, John Amos	E. E.	Fr.	Corvallis
Horning, Benjamin	Phar.	Jr.	Toledo

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Horning, Emil Edwin	Com.	Jr.	Corvallis
Horning, Helen	D. S.	Fr.	Corvallis
Hosford, Erwin Frederick.....	C. E.	Fr.	Slayton
Hotchkiss, George William.....	Agri.	Fr.	Corvallis
Houliston, George	Agri.	Fr.	East Aurora, N. Y.
Howard, D. C.	Agri.	Jr.	Corvallis
Howard, Russell Marion	Com.	Jr.	Corvallis
Howard, Walter William.....	Agri.	Jr.	Corvallis
Howells, Dr. Allan	Agri.	Spec.	Corvallis
Howitt, Elizabeth A.	D. S.	Fr.	Gresham
Hubbard, Harry Lee	C. E.	Soph.	Amity
Hubler, Cora May.....	Com.	Soph.	Corvallis
Huggins, Chester Chandler.....	Agri.	Spec.	Portland
Hukill, Jesse Brooke	Agri.	Soph.	Corvallis
Hult, Gustaf Wilhelm	For.	Fr.	San Francisco, Calif.
Humason, Matilda Frances.....	D. S.	Fr.	Spokane, Wash.
Humphrey, Esther	D. S.	Fr.	Eugene
Hunt, Cecil Canova	E. E.	Fr.	Emmett, Idaho
Huntington, Retta	D. S.	Fr.	Yoncalla
Hurlbut, Ira Wilson.....	Com.	S. Sec.	Corvallis
Hurlbut, Walter	Agri.	F. Sec.	Hamlet
Hurley, Alton	Agri.	Fr.	Seattle, Wash.
Hurst, Clarence M.	Agri.	Spec.	Oswego, Kans.
Hurst, Lester	Agri.	Fr.	Pendleton
Hutt, Lester T.	M. E.	Jr.	Yamhill
Hyams, Leo Klein	M. E.	Fr.	Portland
Hyatt, Lowell Lester	M. A.	F. Sec.	Weston
Hyskell, Edward Rogers	Agri.	Fr.	Portland
Ide, Russel S.	Agri.	Fr.	Portland
Irving, Benjamin Barton.....	C. E.	Jr.	Washington, D. C.
Irving, Iona Margaret	D. S.	Soph.	Corvallis
Irwin, Mary Louise	Com.	Soph.	Hood River
Jackson, Della M.	D. S.	Fr.	Lorane
Jackson, Edwin August	Agri.	Fr.	Astoria
Jackson, Ruth	D. S.	Fr.	Portland
Jacobs, Frederick Adolph.....	Agri.	F. Sec.	Firwood
Jakoby, Carl Charles	For.	F. Sec.	Toledo
James, Oscar William.....	C. E.	Jr.	Robinet
Jamison, Dwight Lyman.....	Agri.	Fr.	Corvallis
Jamison, Neal Clement	Agri.	Jr.	Puyallup, Wash.
Jaquith, Roy	Agri.	F. Sec.	Laurel
Jennings, D. V.	E. E.	Fr.	Portland
Jernstedt, Frederick Carl.....	M. E.	Sr.	Carlton
John, Morris	Com.	Fr.	Corvallis
Johns, Miles S.	Agri.	Fr.	Bellingham, Wash.

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Johnson, Alfred	Agri. Fr.	Enumclaw, Wash.
Johnson, Anna Marie	D. S. Sr.	Albany
Johnson, George Edward	M. A. F. Sec.	Portland
Johnson, George R.	Agri. Jr.	Cooston
Johnson, Jennie Louise	D. S. Fr.	Hammond
Johnson, Leo E.	M. E. Sr.	Carlton
Johnson, Lewis Ross	Agri. Fr.	Corvallis
Johnson, Lillian	D. S. Fr.	Corvallis
Jonhston, Frank H.	Agri. Jr.	Portland
Johnston, Owen H.	For. Fr.	Quincy, Wash.
Johnston, Perry N.	Agri. Fr.	Moro
Johnston, Theodore	Agri. Soph.	Moro
Jones, Charles D.	M. A. F. Sec.	Knappa
Jones, Chester Arthur	E. E. Fr.	Corvallis
Jones, Edward Delta	M. E. Fr.	Jefferson
Jones, Frieda Lois	D. S. Fr.	Astoria
Jones, George Clay	C. E. Sr.	Portland
Jordan, Arthur	C. E. Soph.	Pendleton
Jordan, Melvin	Com. Soph.	Corvallis
Josselyn, Benage S.	M. A. F. Sec.	Portland
Joy, Frederick W.	Agri. Spec.	New York, N. Y.
Joyner, Leon	Agri. Fr.	North Bend, Wash.
Kan, Frank F.	Agri. Fr.	Canton, China
Keatley, Dorothy	D. S. Sr.	Castle Rock, Wash.
Keatley, Virginia	D. S. Jr.	Castle Rock, Wash.
Keefover, Fank Azem	Com. Sr.	Salem
Kehrli, Frank Walter	Agri. Jr.	Hillsdale
Keller, Anna	D. S. Jr.	Portland
Keller, Fred John	Agri. F. Sec.	Portland
Kellogg, Don Gilbert	Agri. Sr.	Hoquiam, Wash.
Kelly, Glenn Curtis	Agri. Sr.	Portland
Kelly, John L.	Phar. Spec.	Jefferson
Kennedy Albert Seavey	Agri. Spec.	Athens, Ala.
Kennedy, Rowe Davis	M. E. Soph.	Corvallis
Kenton, Ralph Mills	M. E. Fr.	Albany
Kerns, Ward Buchtel	M. E. Soph.	Portland
Keyser, Florence B.	D. S. Fr.	Corvallis
Kidder, Ethel	D. S. Fr.	Portland
Kidder, Melba	D. S. S. Sec.	Portland
Kimble, Harry Frank	Agri. F. Sec.	Portland
Kimble, Loren	Com. Spec.	Portland
King, Charles Allen	E. E. Soph.	Ashland
King, Edgar Herman	E. E. Fr.	Cottage Grove
King, Luther Andrew	M. E. Fr.	Cottage Grove
King, Norman William	Com. Fr.	Canton, China

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
King, William O.	Agri.	Jr.	Eugene
Kingsley, Earl J.	Com.	Fr.	Corvallis
Kirkpatrick, Kathreen	D. S.	Jr.	Pendleton
Kistler, Leonard Humphrey ..	E. E.	Sr.	Portland
Kittleson, Nora	D. S.	F. Sec.	Dallas
Klinghammer, Reinhold	Agri.	Fr.	Elgin
Klum, Otto	Opt.	.....	Ashland
Knight, Arthur Wheelock ..	Agri.	Fr.	Glendale, Calif.
Koenig, Walter Jacob	Agri.	Soph.	Corvallis
Koon, Harvey	Phar.	First Yr.	Portland
Koons, Hubert Edson	Agri.	Fr.	Orland, Calif.
Krantz, Earl Beach.....	Agri.	Soph.	Corvallis
Krause, Gustav W.	Agri.	Soph.	Cornelius, Wash.
Kreps, Russell Richard.....	Agri.	S. Sec.	Laurel, Wash.
Kroner, Leo	M. E.	Soph.	Corvallis
Kuhnhausen, Arnold E.	E. E.	Jr.	Portland
Kurtz, Harry L.	Phar.	First Yr.	Rainier
Lafky, Ernest Herman	Agri.	Soph.	Salem
Laird, Ralph P.	Agri.	Fr.	Creswell
Laird, Thomas Walter	Phar.	First Yr.	Bandon
Lake, Emery Dudley	Agri.	Fr.	Eugene
Lamb, Howard M.	Phar.	Soph.	Fossil
Lamley, Harry B.	Min.	Jr.	Portland
Lamoreux, Louis Andrew	For.	Fr.	San Francisco, Calif.
Lamoreux, Thomas Liggett ..	Agri.	Fr.	San Francisco, Calif.
Lance, Arthur L.	Agri.	Soph.	Corvallis
Lance, Mayme Elizabeth.....	D. S.	Jr.	Corvallis
Lance, Neely Samuel	Agri.	S. Sec.	Corvallis
Landwehr, Walter Richard ..	Min.	Fr.	Cottage Grove
Lane, Vivian Maude	D. S.	Fr.	Harrisburg
Lange, Alfred J. H.	E. E.	Fr.	Portland
Lansdale, Zane Arthur.....	C. E.	Fr.	Weston
Lantz, Mable	D. S.	Spec.	Cove
Larson, Adolph Leonard....	Agri.	Soph.	Astoria
Laskar, Adhar Chandra	E. E.	Soph.	Calcutta, India
Lau, Paul	Com.	Fr.	San Francisco, Calif.
Lawrence, Bert Fowler	Com.	Fr.	Forest Grove
Lawrence Sylvester Ernest ..	Agri.	Fr.	Portland
Laythe, Leo L.	Agri.	Fr.	Harriman
Lee, Earl Francis	Com.	Fr.	Waterville
Leeper, Enid Glenda	Com.	Soph.	Corvallis
Leonard, Ira Edwin	Agri.	Fr.	Montecito, Calif.
Leonette, Frederick Theodore ..	C. E.	Fr.	McCloud, Calif.
Lester, Warren Chauncey....	Com.	Spec.	Warrenton

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Lettenmaire, Walter	Agri.	Fr.	Hubbard
Leweaux, Victor H.	Phar.	Fr.	Corvallis
Lewis, Clayton Brown	Agri.	Soph.	Portland
Lewis, D'Alvin	Com.	Fr.	Montavilla
Lewis, Dolorosa	D. S.	F. Sec.	Smith River, Calif.
Lewis, Elizabeth Thurman	D. S.	Soph.	Pacific Grove, Calif.
Lewis, Harry H.	Agri.	F. Sec.	Portland
Lewis, Katherine B.	D. S.	Fr.	Portland
Lewis, William Atwood	Com.	Fr.	Somerville, Mass.
Liddle, Mrs. Edith Dunn	Opt.		Corvallis
Likins, Nelson	Com.	Sr.	Portland
Lindeman, Laird N.	Agri.	S. Sec.	Monmouth
Lindsay, Alexander Lewis	Agri.	Fr.	Hilo, Hawaii
Lindsley, Sterling Ladner	M. E.	Fr.	Portland
Litch, Maude E.	D. S.	Fr.	Enterprise
Livingston, Robert	Agri.	Soph.	Portland
Locker, Leonard Joseph	M. E.	Fr.	Burns
Loken, Edward Benjamin	C. E.	Jr.	Harrisburg
Long, Yick	Com.	Soph.	Canton, China
Looff, Hans Walter	For.	Fr.	Milton
Loosley, Claude F.	Agri.	Soph.	Ft. Klamath
Loughary, Edithe	Opt.		Monmouth
Loughary, Ivan H.	Agri.	Fr.	Monmouth
Loughery, George Herbert	Agri.	Soph.	Pasadena Calif.
Louttit, Clarence W.	Agri.	F. Sec.	Portland
Louttit, Thomas Alfred	Agri.	F. Sec.	Portland
Lucas, Fred Albert	Com.	Fr.	Bend
Lundeen, Arthur Robert	For.	Fr.	Rock Island, Ill.
Luxton, William L.	M. A.	F. Sec.	Idaho Falls, Idaho
Lyon, Helen	D. S.	Fr.	Corvallis
Lyster, Kathleen	D. S.	Soph.	Corvallis
McAdams, Orville Ellis	C. E.	Fr.	Portland
McAlister, Ward Richards	Agri.	Soph.	Logan, Utah
McBride, Lawrence Leon	Agri.	Sr.	Eddyville
McCabe, Frederick	C. E.	Fr.	Portland
McClaren, Joe Wallace	Com.	Soph.	Wallowa
McClellan, Thomas Richard	Agri.	Fr.	Turner
McClure, Ernest	Agri.	Fr.	Moro
McColley, Rodrick Allen	M. E.	Fr.	Albany
McComb, Mrs. Jessie D.	D. S.	Spec.	Corvallis
McConaghy, Dan	Agri.	Fr.	Los Angeles, Calif.
McCormick, Andrew C.	Agri.	Soph.	Lebanon
McCormick, Harl Craig	Agri.	Fr.	Drain
McDaniel, Ernest Penn	E. E.	Sr.	Corvallis
McDermott, Katherine	D. S.	Fr.	Portland

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
McDermott, Mary Ellen.....	D. S.	Fr.	Portland
McDonald, Allie	D. S.	Soph.	Corvallis
McDonald, Paul	Com.	Fr.	Medford
McFadden, Curran Lane	Phar.	Soph.	Corvallis
McFadden, Julia Eleanor	D. S.	Jr.	Corvallis
McGee, Roy Oliver	Agri.	Jr.	Airlie
McGinnis, James Luther	Agri.	Soph.	Corvallis
McGinnis, Paul Herbert	M. A.	S. Sec.	Gest, Ky.
McGowan, Leonore	D. S.	S. Sec.	McGowan, Wash.
McGuire Helen Martha.....	D. S.	Jr.	The Dalles
McKee, Hazel Adelia	D. S.	Jr.	Corvallis
McKee, Robert Tandy	M. E.	Jr.	Lakeview
MacKenzie, Agnes	D. S.	Fr.	Weston
MacKenzie, Kenneth	Com.	F. Sec.	Weston
McKenzie, LeRoy Roderick.....	Com.	Sr.	Summerville
McKenzie, Robert Roderick.....	E. E.	Sr.	Lostine
McKinney, Esther	D. S.	Spec.	Centerville, Wash.
McKinney, Loette V.	Com.	Soph.	Waitsburg
McLagan, Ruby	D. S.	Fr.	Tangent
McLean, William Donald	Com.	Fr.	Kakabeka Falls, Can.
McMahan, Clarence,	Agri.	Fr.	Randle, Wash.
McMillan, Anthony	Agri.	Fr.	Oakland, Calif.
McMillan, M. Estella	D. S.	Fr.	Lorane
McMinn, Roy Ben	Opt.		Portland
McNair, Rittie	D. S.	Fr.	Bandon
McNamee, Benjamin Henry.....	C. E.	Sr.	Portland
McNish, Bessie M.	D. S.	Fr.	Dayton
McPhee, Clyde	Agri.	Fr.	North Powder
McQuaid, Zena	D. S.	Fr.	Portland
McVey, Jacob Ambrose	M. A.	S. Sec.	Harrisburg
Macpherson, William Maxfield.....	Agri.	Soph.	Pasadena, Calif.
Magness, John Robert.....	Agri.	Jr.	Amity
Malik, Ghulam Mohamed.....	Com.	Fr.	Lahore, India
Mangold, Alfred Oscar.....	E. E.	Jr.	Portland
Manners, Charles Haddon.....	Agri.	Soph.	New York, N. Y.
Manning, Kenneth Cobb.....	Agri.	Fr.	Portland
Manula, Wayne Erik	E. E.	Fr.	Astoria
Marcks, Raymond A.	Agri.	Fr.	Corvallis
Marsden, Anna	D. S.	S. Sec.	Beaverton
Martin, Frances Clair	M. E.	Soph.	Corvallis
Martin, Guy E.	Phar.	Fr.	Corvallis
Martin, John Holmes	Agri.	Jr.	Albany
Marvin, Julia	D. S.	Fr.	Enterprise
Mason, Albert Freeman	Agri.	Jr.	Pasadena, Calif.

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Mason, Joy	Com.	Jr.	Hood River
Mason, Rose Coffman	Phar.	Jr.	Jefferson
Mason, Walter Harold	E. E.	Fr.	Ione
Mather, Arthur Gilmore	Min.	Soph.	Clackmas
Mattson, Marshall	M. E.	Fr.	Astoria
Maxfield, Alice	Com.	S. Sec.	Airlie
May, Thomas Everett	Com.	Jr.	Portland
Meade, Frank Fulton	For.	Fr.	Elgin
Mehl, Paul	Agri.	Soph.	Chicago, Ill.
Meng, Edwin Anton	Agri.	F. Sec.	Lents
Mentzer, Lottie F.	D. S.	Jr.	Pendleton
Mercer, Frank Baker	Phar.	First Yr.	North Powder
Mercer, Grover Cleveland	Phar.	First Yr.	North Powder
Mescher, Virginia	Com.	Sr.	Silverton
Metzger, William Ernest	Com.	Jr.	Portland
Metzler, Ethel M.	D. S.	Jr.	Corvallis
Meyers, J. Donald	Com.	Soph.	Salem
Michelbrook, Roy	M. E.	Fr.	McMinnville
Middlekauff, Mark Humbert	Agri.	Fr.	Yaquina
Milam, Lottie	D. S.	Jr.	Macon, Mo.
Miller, Alice Ruth	Com.	Soph.	Corvallis
Miller, Archie Jackson	E. E.	Fr.	Enterprise
Miller, Carl N.	For.	Jr.	Indianapolis, Ind.
Miller, Charles William	E. E.	Fr.	Milton
Miller, Emily Marie	D. S.	Sr.	Corvallis
Miller, Fred Merle	M. E.	Jr.	Albany
Miller, Harry D.	M. A.	S. Sec.	Corvallis
Miller, Horace M.	Agri.	Soph.	Portland
Miller, Julia B.	D. S.	Soph.	Amity
Miller, Loraine Helen	D. S.	Jr.	Portland
Miller, Roy Edmund	Agri.	Soph.	Spokane, Wash.
Millering, Jay Mathew	Opt.		LaGrande
Millikin, Damon	M. E.	Fr.	Ontario
Millikin, Stanley John	E. E.	Soph.	Ontario
Mills, Arthur Ernest	Agri.	Jr.	Forest Grove
Mills, Edna Lola	D. S.	Fr.	Forest Grove
Milner, George R.	E. E.	Sr.	Okmulgee, Okla.
Mitchell, Grace Elizabeth	D. S.	Fr.	Medford
Moe, Forrest Lester	Agri.	Fr.	Hood River
Moffitt, Cecil Paul	Agri.	Sr.	Junction City
Monger, Walter Victor	E. E.	Fr.	Parkplace
Montague, Cass Edward Orval	Com.	Spec.	Arlington
Montague, Erwin Jones	Com.	Sr.	Arlington
Montgomery, G. Millage	Agri.	Sr.	Los Angeles, Calif.

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Moore, Blanche	D. S.	Fr.	McMinnville
Moore, Frank Waltz	For.	Soph.	Newberg
Moore, Mrs. Ida Robinson.....	Com.	Spec.	Corvallis
Moore, Jesse W.	Agri.	Soph.	Harrisburg
Moore, Merle	M. E.	Soph.	Corvallis
Moore, William Tracy	C. E.	Soph.	Oak Grove
Morehouse, Margaret	D. S.	Sr.	Eugene
Moreland, Julius C.	Min.	Fr.	Portland
Morgan, Mary	D. S.	F. Sec.	Heppner
Morris, George Willis.....	E. E.	Sr.	Corvallis
Morris, Joseph Theodore	Opt.		Corvallis
Morris, Orville	Agri.	F. Sec.	Terrebonne
Morris, Sarah	D. S.	Soph.	Rainier
Morrison, Eugene	Agri.	F. Sec.	Williams
Morrison, Ruth	D. S.	Fr.	Hood River
Morse, John J.	Agri.	Jr.	San Francisco, Calif.
Mosby, David Clayborn	C. E.	Fr.	Cottage Grove
Mosby, Harold Herbert*	Agri.	Fr.	Cottage Grove
Motley, Jesse William	M. E.	Soph.	Cove
Moznette, George Franklin	Agri.	Jr.	Vancouver, Wash.
Muck, John Edgar	M. E.	Soph.	St. Johns
Mudd, Vivian	D. S.	F. Sec.	Hammond
Mulkey, Oren	E. E.	Fr.	Myrtle Creek
Murch, George S.	E. E.	Fr.	Marshfield
Murphy, Foster McKinley	Agri.	Soph.	Evanston, Ill.
Murphy, Golda	Opt.		Forest Grove
Murphy, Loretta Belle	Opt.		Forest Grove
Naito, Tadasu	Agri.	Fr.	Tokyo, Japan
Narkans, Joseph	For.	F. Sec.	Weston
Nash, Jack Walter	C. E.	Fr.	Albany
Neale, Eric William	For.	Fr.	Willow Point, Canada
Neer, Francis Edward	Agri.	Jr.	Pasadena, Calif.
Nehl, Albert Henry	Com.	Soph.	Woodburn
Nelson, Frank Montgomery	Agri.	Fr.	Portland
Nelson, Kenneth	Agri.	Soph.	Eugene
Nelson, Willard Young	C. E.	Fr.	Lafayette
Newcomb, Gilbert Rockwell	For.	Fr.	Campbell, Calif.
Newell, Harry L.	Agri.	S. Sec.	Portland
Newins, Geraldine	D. S.	Fr.	Patchogue, N. Y.
Newmyer, Ruth	D. S.	Fr.	Chemawa
Nibler, William Henry	Phar.	Sec. Yr.	Gervais
Nichols, Tressa Elizabeth.....	Opt.		Corvallis
Nicholson, Raymond Edward.....	Agri.	Soph.	Hood River
Niederer, Carl Emil	M. E.	Jr.	Summerville

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Nixon, Clara M.	Agri.	Spec.	Trumansburg, N. Y.
Noble, Leon	Agri.	Fr.	Hood River
Noren, Carl Albin	Agri.	Soph.	Reedley, Calif.
Norris, William Thomas	Agri.	S. Sec.	Fort Klamath
Norton, Edmond Carlyle	Com.	Spec.	Olex
Norton, James Emmet	Com.	Jr.	Airlie
Norton, Walter Bert	M. A.	S. Sec.	Langlois
Norton, Wenny Leonard	For.	S. Sec.	Langlois
Nunamaker, F. D.	Agri.	Soph.	Hood River
Oakes, Charles Ernest	E. E.	Jr.	Enterprise
Oakes, Mary	D. S.	Fr.	Grants Pass
Oberdorfer, Harold	Com.	Fr.	Portland
O'Connor, Kate*	D. S.	Jr.	Montogue, Calif.
Odeen, Henry	C. E.	Jr.	Portland
O'Donnell, Ellen	D. S.	Jr.	Portland
Okamoto, Kakoji	Agri.	Sr.	Kumamoto, Japan
Olcott, Wiley Hurbert	E. E.	Fr.	Canyonville
Olmsted, Aron Lemmel	Agri.	Soph.	Enterprise
Olmsted, Irl Louis'	E. E.	Soph.	Enterprise
O'Mara, George V.	Min.	Fr.	Portland
O'Neel, Ruel Glover	C. E.	Fr.	Portland
Orford, Christine	D. S.	Jr.	DeLamar, Idaho
Orr, Helen	D. S.	Fr.	Hood River
Osburn, Margaret	D. S.	Sr.	Newport
Otis, Ralph Gray	Agri.	Fr.	Newberg
Overholser, Leroy Leighton	M. E.	Fr.	Pomeroy, Wash.
Overton, James White	M. A.	F. Sec.	Astoria
Paddelford, James Harold	Agri.	F. Sec.	Carey, Idaho
Padgham, Henry I.	Agri.	Jr.	Santa Ana, Calif.
Page, Charles Culver	Agri.	Fr.	Hood River
Page, John Albert	E. E.	Fr.	Enterprise
Paine, J. Howard	Agri.	Fr.	Portland
Palmer, Elizabeth	D. S.	S. Sec.	Dayton
Palmer, Ernest N.	Agri.	Jr.	Central Point
Parcel, J. Albert	Phar.	Fr.	Corvallis
Parelius, Ethel B.	D. S.	Fr.	Portland
Park, Ida	D. S.	S. Sec.	Corvallis
Park, Jas. Pennington	Agri.	Fr.	Corvallis
Park, Winniford	D. S.	S. Sec.	Corvallis
Parker, Lorene	D. S.	Soph.	Salem
Parratt, Sydney Lloyd	C. E.	Fr.	Corvallis
Parrish, Fairfax Hayes	M. E.	Soph.	Roseburg
Patterson, Winnifred	D. S.	Soph.	Corvallis

*Deceased.

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Patton, Harry C.	M. A.	S. Sec.	Macleay
Patton, Vernon	M. A.	F. Sec.	Macleay
Payne, Nola	D. S.	Jr.	Woodburn
Payne, Roy	M. E.	Fr.	Corvallis
Pearcy, Earl	Agri.	Sr.	Portland
Pearcy, Harris Leland	Agri.	Fr.	Portland
Pearson, Roderic	C. E.	Fr.	Portland
Pease, Pauline	D. S.	Sr.	Portland
Pechin, William Grover	Com.	S. Sec.	Forest Grove
Peck, Robert	For.	F. Sec.	Los Angeles, Calif.
Peery, Harold Morris	Phar.	Sr.	Springfield
Peery, Wilson Kimsey	Agri.	Jr.	Dayton
Pelland, Francis Gerald	E. E.	Soph.	St. Paul
Peninger, Bertha	Com.	S. Sec.	Medford
Peninger, Mary	Com.	S. Sec.	Medofrd
Penland, Nell	D. S.	S. Sec.	Sheridan
Perard, Desire Joseph	Phar.	Sr.	Toppenish, Wash.
Peterson, Carl Edward	E. E.	Fr.	Portland
Phalon, Lillian Ruth	D. S.	Fr.	Portland
Philippi, Albert Roy	Agri.	Fr.	Early
Philippi, Leora	D. S.	Fr.	Early
Phillips, James Henry	Agri.	Jr.	Fullerton, Calif.
Pierce, Edgar Turner	Com.	Sr.	Harrisburg
Pimm, Charles	M. E.	Fr.	Philomath
Pinn, Frederick Edwin	E. E.	Fr.	White Salmon, Wash.
Pippy, Kathleen May	Opt.		Portland
Pippy, Winnifred	D. S.	Fr.	Portland
Pirtle, Mary Louise	Opt.		Albany
Platt, Dwight Gilbert	For.	S. Sec.	Idaho Falls, Idaho
Polk, Clifford George	C. E.	Soph.	Corvallis
Pomerene, Henry Wade	Agri.	Spec.	Lincoln, Nebr.
Porter, Alice Elizabeth	Opt.		Eugene
Porter, Harry Baxter	M. E.	Fr.	Corvallis
Porter, Lester Denzil	Com.	Sr.	Corvallis
Porter, Ruth R.	D. S.	Spec.	Eugene
Post, Clara Olga	Com.	S. Sec.	Blackly
Post, Elmer O.	Agri.	S. Sec.	Blackly
Potter, Elmer C.	Com.	Soph.	Portland
Powell, Charles Kelly	Agri.	Fr.	Payette, Idaho
Powell, Robin	Com.	Fr.	Cottage Grove
Powell, William Lester	For.	Fr.	Azusa, Calif.
Prader, Verna	Com.	Spec.	Talent
Pribble, Roland Carson	M. E.	Fr.	Portland
Price, Lloyd Demain	M. E.	Soph.	Scappoose
Pugh, James Elza	For.	Fr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Purves, Delia Jeannette	D. S.	Sr.	Seattle, Wash.
Raber, Clifford Wayne	Com.	Soph.	Corvallis
Raddas, Gladys Charlotte	Com.	S. Sec.	Corvallis
Ramsey, Frances Claire	Com.	Spec.	Oakridge
Randall, Elsie	D. S.	Fr.	Idaho Falls, Idaho
Rasmussen, Gordon	Com.	Spec.	Marshfield
Rawson, Virgil Arthur	M. E.	Jr.	The Dalles
Read, Lance	E. E.	Sr.	Portland
Reed, John Edward	Agri.	Fr.	National City, Calif.
Reesor, Leora	Opt.		Idaho Falls, Idaho
Reeves, Orville G.	M. E.	Jr.	Pendleton
Reichart, Emanuel Henry	C. E.	Fr.	Corvallis
Reineman, Lester Albert	Agri.	Spec.	Freewater
Reynolds, Charles Henry	Phar.	Sr.	LaGrande
Reynolds, Lee Edward	Agri.	Fr.	La Grande
Rhinehart, Audra	D. S.	Fr.	Corvallis
Rice, Thomas Alfred	Min.	Jr.	Portland
Richards, Dale E.	Agri.	Fr.	Kalispell, Mont.
Richards, Herbert Lewis	Agri.	F. Sec.	Portland
Richardson, S. Whitley	Min.	Sr.	Salem
Ridehalgh, Walter Thayer	M. E.	Fr.	Portland
Riley, Chester A.	Phar.	Fr.	Enterprise
Rinearson, Peter Melvin	C. E.	Jr.	Milwaukee
Rineman, Hugo	Agri.	Spec.	Pasadena, Calif.
Robbins, Adah Elizabeth	Com.	Spec.	Corvallis
Robbins, Leaman T.	Com.	F. Sec.	Medford
Roberts, Glen H.	Agri.	Soph.	Cove
Roberts, John Irving	C. E.	Jr.	Sandy
Robertson, Ben Harold	C. E.	Soph.	Portland
Robey, Gladys Aileen	D. S.	Fr.	Corvallis
Robins, Charles Vincent	Com.	Soph.	Turner
Robinson, Charles L.	Agri.	Jr.	Forest Grove
Robinson, Mable	Com.	Spec.	Corvallis
Robson, Allan Edward	M. E.	Fr.	Corvallis
Rodgers, Marie	D. S.	Fr.	Portland
Rogers, Elma Ola	Opt.		Corvallis
Rogers, Wilber Leslie	M. A.	S. Sec.	Corvallis
Rohr, Frank	M. E.	Fr.	Astoria
Rollins, Ralph T.	Com.	S. Sec.	Corvallis
Romig, Frank Vernon	M. E.	Fr.	McCoy
Root, Vivian Oliver	Opt.		Eugene
Rorick, Elmer Eugene	Com.	Spec.	Corvallis
Rosenthal, Bertrand J.	Com.	Fr.	Portland
Rothenberg, Paul William	Agri.	F. Sec.	Pasadena, Calif.
Rowe, Andrew Carl	M. A.	F. Sec.	Edgewood, Calif.

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Rush, Benjamin Franklin	C. E.	Fr.	Elgin
Russell, Anna B.	D. S.	Fr.	Portland
Russell, Henry Woodruff	Com.	Fr.	Beaver Hill
Rutledge, Anna Neave	D. S.	Soph.	Corvallis
Rutledge, Ralph M.	Agri.	Jr.	Corvallis
Salomon, Wilda	D. S.	Jr.	Salem
Sanborn, Guy Orlando	Com.	Spec.	Astoria
Sanders, George F.	Agri.	Jr.	The Dalles
Sant, W. S.	Com.	Fr.	Akola, India
Sather, John Adolph	Com.	Fr.	Bend
Sato, Juemon	Agri.	Fr.	Sado, Japan
Savage, Henry I	Agri.	Jr.	Seattle, Wash.
Savage, Robert Havilah	M. E.	Soph.	Salem
Savage, Stella	D. S.	Spec.	Salem
Sawyer, Louis	Agri.	Sr.	Salem
Schaff, Nicholas	Agri.	Fr.	Oregon City
Schaltenbrand, Otto	Agri.	S. Sec.	Sherwood
Schieve, L. George	M. A.	F. Sec.	Portland
Schiffman, Hazel	D. S.	Spec.	Bay City
Schneider, Edmund	Agri.	F. Sec.	Portland
Schneider, Nicholas	M. A.	F. Sec.	Portland
Schoth, Harry August	Agri.	Jr.	Oregon City
Schram, Elwina Emilie	D. S.	Fr.	Salem
Schram, Lloyd Chester	E. E.	Soph.	Oregon City
Schreiber, Fred William	Agri.	Soph.	McMinnville
Schreiber, Herbert George	M. E.	Soph.	McMinnville
Schreiber, Martin Andrew	Agri.	Fr.	McMinnville
Schroeder, Alice	Opt.		Winant
Schroeder, Bertha Amelia	D. S.	Jr.	Winant
Schroeder, Gertrude E.	D. S.	Soph.	Winant
Schubert, Ben W.	For.	Fr.	Silverton
Schuster, Carl Ephraim	Agri.	Soph.	Corvallis
Scoggin, Paul	Agri.	Fr.	Tumalo
Scott, Alfred Merle	M. A.	S. Sec.	Scott's Mills
Scott, Jennie Ritchie	Agri.	F. Sec.	Corvallis
Scott, Mary Ritchie	Agri.	F. Sec.	Corvallis
Scoville, Eugene Herman	C. E.	Sr.	Grants Pass
Scudder, Joy William	Agri.	Jr.	Seattle, Wash.
Seibert, Harry	E. E.	Soph.	Pendleton
Seim, Bernard	M. A.	S. Sec.	Astoria
Sengupta, Satyendranath	Agri.	Spec.	Calcutta, India
Sestak, Malana	D. S.	S. Sec.	Stayton
Severance, Ivan Harrison	M. E.	Jr.	Hardman
Shahan, Lelah	D. S.	Jr.	Portland
Shake, Homer Harrison	E. E.	Sr.	Payette, Idaho

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Shattuck, Obil	Agri. Jr.	Klamath Falls
Shaver, Leo	C. E. Fr.	Molalla
Shaw, Edith	D. S. Jr.	Salem
Shaw, James Neven	Agri. Soph.	White Bluffs, Wash.
Shepard, Ruth Juanita	Opt.	Roosevelt, Wash.
Sherman, George	Agri. F. Sec.	Pendleton
Shields, Eva	D. S. Fr.	Milton
Shields, Winnie	D. S. Jr.	Milton
Shinn, Robert Erwin	Agri. Jr.	Albany
Shirley, James Carlton	Phar. Jr.	McMinnville
Shoemaker, Glen	Agri. Fr.	Orange, Calif.
Siefert, Herbert William	Agri. Jr.	Pasadena, Calif.
Siler, William R.	Agri. Soph.	Randle, Wash.
Simpson, John Ernest Henry....	M. E. Fr.	Portland
Sinks, Victor Hammond	E. E. Fr.	Portland
Skaggs, Guy Ellison	Phar. Fr.	Flora
Skelton, Albert Gordon	Agri. S. Sec.	Corvallis
Skelton, Mary V.	D. S. Soph.	Corvallis
Slavin, Joseph Andrew	Agri. Fr.	North Yakima, Wash.
Slippern, Arild Cato	M. E. Fr.	Portland
Smart, William Anderson	Agri. Soph.	Santa Ana, Calif.
Smith, Clifton	Min. Fr.	Salem
Smith, Dexter Ralph	C. E. Jr.	St. Johns
Smith, Esther Ruby	D. S. Soph.	Corvallis
Smith, Francis Willard	C. E. Sr.	Portland
Smith, Glen Wood	M. E. Soph.	Washougal, Wash.
Smith, John Mitchell	Agri. Fr.	Baker
Smith, Lawrence Howard	Com. Fr.	Bend
Smith, Mildred Emma	D. S. S. Sec.	Portland
Smith, Simeon	Phar. Fr.	Portland
Smith, Veta M.	D. S. F. Sec.	Tiller
Smyth, Darius H.	Phar. Fr.	Smith
Soden, Mildred	D. S. Jr.	Portland
Sodhi, S. Charn Singh.....	M. A. F. Sec.	Amritsar, India
Somers, George B.	Agri. F. Sec.	Hermiston
Soo, Taki Herbert	Agri. Fr.	Hong Kong, China
Sorenson, Jo	E. E. Jr.	Portland
Spalding, H. Clifford	For. Fr.	Salem
Spalding, Martin	Agri. Fr.	Goldendale, Wash.
Spaulding, Amber Bessie....	D. S. Sr.	Albany
Spencer, Evelyn	D. S. Jr.	Portland
Squires, Ralph Linden	Agri. F. Sec.	S. Bellingham, Wash.
Stambach, George Mahlon	Agri. Soph.	Pasadena, Calif.
Standley, Josie	Com. F. Sec.	Camas Valley

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Stanley, Mary Alta	D. S.	Fr.	Coquille
Starker, Carl Allison	Agri.	Jr.	Portland
Starr, Carroll Theodore	Agri.	Fr.	Hanford, Calif.
Starr, George Winfield	Agri.	Soph.	Corvallis
Stauff, Oscar Brent	Agri.	Jr.	Cooston
Stauff, Victor Hugo	Agri.	Jr.	Cooston
Steineker, Mrs. May	D. S.	Jr.	Portland
Steinmetz, Avery Harold	Agri.	Fr.	Portland
Steusloff, Dorothea	D. S.	Sr.	Salem
Steusloff, May	D. S.	Fr.	Salem
Stewart, William Halbert	For.	Soph.	Fossil
Still, Bert Leon	E. E.	Fr.	Medford
Stirling, Agnes	Com.	Spec.	Burns
Stirling, Janet Finlayson	D. S.	Fr.	Burns
Stoker, Robert Leslie	Agri.	Spec.	Vernon, Canada
Stoneberg, Hugo F.	Agri.	Soph.	Coburg
Stoppenbach, Donald Chapman	E. E.	Fr.	Portland
Story, Carl Leverne	Com.	Fr.	Airdie
Stover, Allan James	Agri.	Jr.	Corvallis
Strain, Clayton Preston	Agri.	Fr.	Pendleton
Strang, C. Virgil	Phar.	Spec.	Medford
Strang, Frederick Lawrence	Agri.	Sr.	Medford
Straughan, James Alfred	M. E.	Soph.	Corvallis
Strome, Carey L.	Agri.	Fr.	Junction City
Strong, Leon Byron	E. E.	Soph.	Moro
Struble, Frank Howard	Opt.		Corvallis
Struve, Hans	Agri.	Soph.	Pendleton
Stubblefield, Nellie	D. S.	Fr.	Enterprise
Stryker, Gordon David	Com.	S. Sec.	Portland
Suffron, Fay Oakley	C. E.	Soph.	Dent, Minn.
Sult, Michael C.	Com.	F. Sec.	Summer Lake
Summers, Mylius Lysle	D. S.	Jr.	Portland
Supple, Joseph	Agri.	S. Sec.	Portland
Sutherland, Frank Gillette	Agri.	Fr.	Minneapolis, Minn.
Sutherland, Ruth	D. S.	Fr.	Portland
Sutton, Avon William	Agri.	S. Sec.	Parkdale
Sutton, George	M. A.	S. Sec.	Port Orford
Sutton, Harry Allen	E. E.	Fr.	Aumsville
Sweeney, Anna Grace	D. S.	Fr.	Murphy
Swinson, Fred Leigh	Com.	Fr.	Monroe
Sykes, Clara Louise	Opt.		Corvallis
Tadlock, Hubert	E. E.	Soph.	Corvallis
Tagg, Elvia Wain	D. S.	Soph.	Warrenton

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Tagg, Lystra Alice	Opt.	.....	Warrenton
Tagg, Verna Mary	Com.	Soph.	Warrenton
Tamerlane, Rex	M. E.	Fr.	Portland
Tartar, Nicholas Linn	Phar.	Soph.	Corvallis
Taylor, Armond	M. E.	Fr.	Corvallis
Taylor, George Wells	Agri.	Fr.	Oakland
Taylor, Jesse LaVerne	C. E.	Soph.	Oregon City
Teel, Harry Mark	C. E.	Sr.	Echo
Telford, Wilbur Linden	M. E.	Fr.	Klamath Falls
Thayer, Gilbert	E. E.	Jr.	Portland
Theobald, Wanda	D. S.	Fr.	Silverton
Thomas, George Randolph	E. E.	Soph.	Portland
Thomas, Ralph William	C. E.	Fr.	Corvallis
Thomes, Daniel	M. E.	F. Sec.	Portland
Thompson, Agnes	D. S.	Fr.	Albany
Thompson, Ava	D. S.	F. Sec.	Gresham
Thompson, Claude Clifford	Agri.	Fr.	Roseburg
Thompson, Earl H.	Agri.	Fr.	Pasadena, Calif.
Thompson, Royal Burleigh	Agri.	Sr.	Corvallis
Thompson, William McKinley	Agri.	F. Sec.	Burns
Thompson, Reginald H.	M. A.	F. Sec.	Victoria, B. C.
Thordarson, Lillian	D. S.	Jr.	Corvallis
Thrift, Belle	D. S.	Fr.	Coquille
Tinker, Harold William	Agri.	Soph.	Corvallis
Tipley, Grace	D. S.	Fr.	Fossil
Tomlinson, Arthur Raymond	C. E.	Fr.	Albany
Torgersen, K. A.	M. E.	Spec.	Astoria
Towne, Elbert Louis	Agri.	F. Sec.	Carrolton
Tripp, Stanley Everett	Min.	Sr.	Corvallis
True, Mrs. Elsie G.	Opt.	.....	Sherwood
Tucker, Elmer	Phar.	Fr.	Weston
Tucker, John Edward	Agri.	Fr.	Portland
Turlay, Harold S.	For.	Sr.	Astoria
Turlay, Marian	D. S.	S. Sec.	Astoria
Turlay, Maude Josephine	Opt.	.....	Corvallis
Turner, Arthur Edward	E. E.	Fr.	Union
Turner, Blaine	Agri.	Soph.	Cleone
Turner, Eva	D. S.	Soph.	Cleone
Turner, Winnifred	D. S.	Fr.	Corvallis
Tycer, Lester D.	E. E.	Sr.	Brownsville
Ueland, Clara Lorraine	Opt.	.....	Roseburg
Ueland, Emma Matilda	D. S.	Sr.	Roseburg

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Underwood, Edward Franklin	E. E.	Fr.	Boyd
Uyei, Nao	Agri.	Fr.	Seattle, Wash.
Vail, J. Lester	Agri.	Soph.	Corvallis
Van Blaricom, Elgin Lawrence	Com.	F. Sec.	Newberg
Van Couvering, Martin	Min.	Soph.	Riverside, Calif.
Vanderwall, Roy E.	Agri.	Fr.	Haines
Van Gundia, Gorden Keller	Agri.	Sr.	Portland
Van Slyke, Mrs. Irene	D. S.	Jr.	Portland
Venner, Levana Frank	Opt.		Brownsville
Venstrand, Carl Peter	Min.	Soph.	Portland
Vernon, Katherine	D. S.	Spec.	Oakland
Vest, Fay Herbert	Agri.	Fr.	Joseph
Vestal, Edgar	Agri.	Fr.	Payette, Idaho
Vilas, George	Opt.		Medford
Vilas, Ned	Opt.		Medford
Vincent, George	C. E.	Fr.	Sherwood
Vineyard, Sarah Bledsoe	D. S.	Jr.	Boise, Idaho
Volck, Helen Louise	D. S.	Fr.	Junction City
Von Lehe, Herbert	Agri.	F. Sec.	LeSeuer, Minn.
Waddell, Robert L.	Agri.	Fr.	Aurora, Neb.
Wade, Tracy William	E. E.	Soph.	Carson City, Wash.
Wagner, Paul Theodore	Agri.	Soph.	Portland
Wahlberg, Leif W.	Agri.	Soph.	San Francisco, Calif.
Wakeman, Louis	Agri.	Fr.	Wesport
Walker, Byron Bently	Agri.	Jr.	Springfield, Ohio
Walker, Henrietta	D. S.	Sr.	Cleveland
Wallace, Grace Eugenia	Com.	Sr.	Independence
Walling, Gertrude LaVern	Com.	Sr.	Salem
Walters, Harry S.	Agri.	Jr.	Corvallis
Warner, Douglas Holmes	Agri.	Soph.	Portland
Warner, Katherine	D. S.	Jr.	Portland
Wasser, Opal Lucile	D. S.	Sr.	Corvallis
Watkins, Edna Bernice	Opt.		Corvallis
Watkins, Laura Lucile	Opt.		Corvallis
Watson, Clifton Howe	E. E.	Fr.	Portland
Watters, William Harp	M. A.	S. Sec.	St. Helens
Watts, George Gordon	M. E.	Soph.	Corvallis
Waugh, Elma Elizabeth	D. S.	Spec.	Toledo
Weaver, Effie	D. S.	Jr.	Myrtle Creek
Weaver, Harold	Agri.	Fr.	Enterprise
Webb, Alice Lindsey	D. S.	Spec.	Corvallis
Webb, Robert Guy	Com.	Soph.	Spirit Lake, Idaho
Weber, Edward Jasper	Agri.	Sr.	Creswell

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Weber, Victor Eugene	E. E.	Jr.	Brownsville
Weberg, Melvin	Agri.	F. Sec.	Suplee
Welch, Claude LeRoy	M. A.	F. Sec.	Portland
Welch, Frank G.	E. E.	Fr.	Salem
Weller, Stanley Morton	E. E.	Fr.	Corvallis
Weller, Theodore Warford	Agri.	Fr.	Corvallis
Wendover, Royce Franklin	For.	Soph.	Stockton, Kans.
Weniger, Wanda	D. S.	Fr.	Corvallis
Wentz, Irene	D. S.	Fr.	Portland
Whitby, Harold R.	Agri.	Soph.	Corvallis
Whitby, Harris	Com.	Soph.	Corvallis
White, Cleo	D. S.	Fr.	McMinnville
White, Mary Jane	D. S.	Fr.	Corvallis
Whitehill, Ellen	D. S.	Fr.	Portland
Whitehouse, William Edwin	Agri.	Soph.	Somerville
Whiteley, Flora	D. S.	Jr.	Corvallis
Whiteley, William Henry	C. E.	Sr.	Victoria, B. C.
Whittier, George Richmond	For.	Fr.	Portland
Wiest, Margaret C.	D. S.	Fr.	Bend
Wiest, M. Pauline	D. S.	Spec.	Bend
Wightman, Parks	Agri.	Spec.	Orchards, Wash.
Wiken, Hazel	D. S.	S. Sec.	McGowan, Wash.
Wilcox, Chester M.	Agri.	Jr.	Portland
Wilcox, Donald Fred	Agri.	Fr.	LaManda Park, Calif.
Wilcox, Ralph M.	Com.	Fr.	Portland
Wilkening, Waldemar	Agri.	Spec.	New York City
Wilkins, Grace	D. S.	Fr.	Coburg
Wilkins, Mitchell	Agri.	Soph.	Coburg
Williams, John Floyd	Agri.	Soph.	Cove
Williams, John R.	Com.	Jr.	Portland
Williamson, Charles Jacob	Com.	Soph.	Corvallis
Williamson, Lowell	Agri.	Spec.	LaGrande
Williamson, Pearl	D. S.	Fr.	Albany
Wilson, Arthur James	Com.	Sr.	Albany
Wilson, Bernadetta	Com.	F. Sec.	Airlie
Wilson, Bessie A.	D. S.	Spec.	North Powder
Wilson, David McKimon	Agri.	Fr.	Linnton
Wilson, Isaac James	Agri.	Fr.	Lewiston, Calif.
Wilson, James Albert	Agri.	Soph.	North Powder
Wilson, James H.	Agri.	Sr.	Gresham
Wilson, Lois Katherine	D. S.	Jr.	Salem
Wilson, Mildred Marie	D. S.	Jr.	Salem
Wilson, Nora Mary	Opt.		Oregon City
Wilson, Violet Viola	Com.	F. Sec.	Airlie
Winslow, Myron M.	Agri.	Sr.	Okmulgee, Okla.

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Winslow, Willis Webster	Com. Sr.	Okmulgee, Okla.
Wisdom, Everett Stanton	Agri. Jr.	Portland
Wolff, Garland Twombly	E. E. Soph.	Portland
Wolke, Clara Martina	D. S. Fr.	Grants Pass
Wood, John Rollo	M. A. F. Sec.	Arlington
Wood, Robert John	Agri. Soph.	Cottage Grove
Wood, Rowena Adelaide	Opt.	Corvallis
Woodcock, Carl Wesley	M. E. Fr.	Kerby
Woodcock, Edwin	Com. Jr.	Corvallis
Wooden, Stewart L.	Agri. Fr.	Elizabeth, N. J.
Woodruff, Herbert M.	E. E. Fr.	Smith River, Calif.
Woodruff, Milton B.	Agri. F. Sec.	Smith River, Calif.
Woods, Lee Roy	For. Fr.	Cottage Grove
Woodward, Anna	D. S. Fr.	Creswell
Woodworth, Dwight	M. E. Fr.	Portland
Woodworth, Gladys	D. S. Fr.	Portland
Wright, Byron C.	Agri. Fr.	Portland
Wright, Edgar Wilson	E. E. Fr.	Portland
Wright, Ralph V.	Agri. Spec.	Croton
Wutenberger, Oscar	Agri. F. Sec.	Sylvan
York, Herbert L.	Opt.	Huntington, Idaho
Yost, Clarence Harry	For. Fr.	Aurora, Nebr.
Young, Earl	M. E. Soph.	Portland
Young, Edna	D. S. F. Sec.	Collins, Wash.
Young, Faith Irene	D. S. Jr.	Boring
Young, Fred Byron	M. E. Jr.	Collins, Wash.
Young, Marian	D. S. Jr.	Woodburn
Zimmerman, Edward	Min. Fr.	Yamhill
Zimmerman, William Earl	M. E. Fr.	Portland
Zwicker, Arthur E.	Agri. Soph.	Portland

SUMMER SCHOOL STUDENTS

(Abbreviations indicate major courses as follows: Coll., College, including Agriculture, Domestic Science and Art, Manual Training, etc.; Meth., Methods in Teaching Industrial and other subjects in public schools; Prep., Preparation for Teachers' Examinations; Super., Methods in Supervision and High School Branches. Most students were registered in two or more of these courses.)

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Anderson, Verlie Eugenie.....	Coll.	Corvallis
Andrews, Marguerita	Prep.	Corvallis
Banks, Emmeline Frances	Prep.	Portland
Banks, Marguerita J.	Prep.	Portland
Bates, Margaret	Prep.	Redmond
Beckwith, Laura A.	Prep.	Sheridan
Bocklund, Bessie	Meth.	Lyle, Wash.
Bodle, Mildred	Coll.	Carlton
Boyles, Margaret	Meth.	Monument
Brown, Katharine	Coll.	Chemawa
Buchanan, Elizabeth May	Coll.	Corvallis
Burchard, Margaret	Prep.	Scottsburg
Cate, Mary Enid	Meth.	Corvallis
Cathey, Alice Marie	Coll.	Corvallis
Chandler, Helen W.	Prep.	Rogue River
Chase, Flora M.	Prep.	Corvallis
Cheney, Maribel Whitman.....	Coll.	Corvallis
Coolidge, Dorothy Florence.....	Coll.	Corvallis
Compton, Ada L.	Prep.	Crabtree
Connor, R. Lois	Coll.	Sheridan
Copson, Godfrey V.	Coll.	Corvallis
Crabtree, Myrtle	Prep.	Albany
Curtis, Mary Bushe	Prep.	White Horse, Canada
Cusick, Mrs. Annie	Coll.	Medford
Davis, Bertha	Meth.	Corvallis
Deems, Charles R.	Super.	Wapinitia
Devlin, Sadie M.	Coll.	Forest Grove
Dobell, Mrs. C. A.	Coll.	Corvallis
Easton, George E.	Coll.	Strawberry Point
Edwards, Belle Beulah	Meth.	Monroe

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Edwards, Belle Bertie	Meth.	Monroe
Enright, Mrs. L. H.	Meth.	Eugene
Ewing, Georgia Virginia	Coll.	Corvallis
Farnham, Grace E.	Prep.	McMinnville
Fletcher, Sylvia	Meth.	Roseburg
Funston, Grace L.	Prep.	Portland
Gardner, Mrs. Evelyn	Meth.	Lakeview
Gillet, Albert H.	Meth.	Chemawa
Gray, Isabelle	Coll.	Philomath
Gray, Miss J. B.	Super.	Portland
Groshong, Luella M.	Coll.	Los Angeles, Calif.
Hagen, Mabel	Prep.	Glendale
Hannah, Florence J.	Prep.	Astoria
Harry, Olive Mary	Coll.	Corvallis
Hassett, Flora	Prep.	Corvallis
Hawley, Willa W.	Coll.	Corvallis
Holt, Hazel	Coll.	Holliston, Mass.
Horner, Mrs. Isabelle	Coll.	Corvallis
Horning, Helen Mabel	Coll.	Corvallis
Huff, Mabel Florence	Prep.	Corvallis
Hull, Lillie Belle	Coll.	Corvallis
Hunt, Pearl	Coll.	Gardner
Johnston, Jane Agnes	Meth.	Corvallis
Keatley, Dorothy	Coll.	Castle Rock, Wash.
Kennedy, Ruby H.	Prep.	Salem
Kenney, Danial J.	Coll.	The Dalles
Knight, Hilda Janet	Prep.	Portland
Lindsay, Alexander Lewis	Coll.	Hilo, Hawaii
Lyster, Kathleen	Coll.	Scottsburg
Maher, Mrs. Lizzie	Prep.	Portland
Mann, Mattie L.	Prep.	Grants Pass
McKee, Hazel Adelia	Coll.	Lakeview
McGinnis, Iva Belle	Prep.	Corvallis
Merritt, Charles Edward	Prep.	Corvallis
Miller, Roy Edmund	Coll.	Spokane, Wash.
Millikin, Ethel	Prep.	Ontario
Murphy, Golda Lou	Coll.	Forest Grove
Murphy, Loretta	Coll.	Forest Grove
Otty, Nellie A.	Prep.	Milwaukie
Paine, J. Howard	Coll.	Portland
Peterson, Fred	Super.	Bonanza
Pimm, Carrie Maud	Meth.	Eugene
Pittman, Anna	Coll.	Walnut, Ill.
Reeves, Amanda	Coll.	McMinnville
Rice, May	Super.	Carlton

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Rogers, R. H.	Coll.	Corvallis
Rutledge, Anna Neave	Coll.	Corvallis
Schoneman, Frederick W.	Coll.	Manito, Ill.
Shonkwiler, Myrtle	Coll.	Portland
Shrode, Jamie	Prep.	Eugene
Sigurdson, Anna	Prep.	Warranton
Smith, Bert H.	Super.	Glendale
Smith, J. Wesley	Meth.	Prineville
Smith, Mrs. Nellie Ross	Meth.	Glendale
Sorenson, Nora J.	Meth.	Springfield
Thompson, Asa C.	Super.	Aurora
Thordarson, Lillian	Coll.	Corvallis
Tillery, Genevieve F.	Meth.	Corvallis
Turnidge, Cora L.	Coll.	Sheridan
Vierhus, Mary	Prep.	Oregon City
Walker, Henrietta	Coll.	Cleveland
White, Albert C.	Super.	Milton
Wiest, Marion L.	Meth.	Bend
Wilcox, Fred Harley	Super.	Oregon City
Willis, Arza M.	Super.	Canyon City
Wood, Macel M.	Meth.	Lostine
Yates, George S.	Super.	Banks
Yokum, Pearl A.	Prep.	Bronxville

SPECIAL MUSIC STUDENTS

Adams, George	Clarinet	Albany
Baker, Verna Jeanette	Piano	Corvallis
Bement, Edna May	Voice	Baker
Bedynek, John P.	Violin	Corvallis
Bedynek, Mary Elizabeth	Piano	Corvallis
Blackledge, Janet Ann	Organ	Corvallis
Blair, Rebecca Taliaferr-	Piano	Corvallis
Broders, Chester Ogburne	Piano	Corvallis
Broders, Roy Raymond	Piano	Corvallis
Brown, Clarence Elton	Piano	Corvallis
Brown, Georgia Katheryn	Piano	Corvallis
Caldwell, Beulah	Piano	Corvallis
Cathey, Evelyn McGarin	Piano	Corvallis
Corrie, Mary Eva	Piano	Corvallis
Curtis, William Jayne	Voice	Corvallis
Davis, Norma	Piano	Corvallis
Felton, Ella Marie	Piano	Corvallis
Fiechter, Martha Ellen	Piano	Corvallis
Gilkey, Beulah Gustavia	Voice	Corvallis

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Hardman, Eleanor	Piano	Corvallis
Hardman, Rozelle	Piano	Corvallis
Haight, Rachel Webb	Voice	Corvallis
Howard, Robert Madison	Trapps	Corvallis
Jackson, Mildred May	Piano	Corvallis
Johnson, Lilian	Piano	Corvallis
Kerr, Genieve	Piano	Corvallis
Kerr, Lynette	Voice	Corvallis
Kerr, Marion Robert	Violin	Corvallis
Kreps, Rhoda Janie	Violin	Laurel, Wash.
Lewis Lucy	Voice	Corvallis
Lewis, Sarah L.	Piano	Corvallis
Lindsay, Annie	Piano	Hilo, Hawaii
McBee, Ida Josephine	Piano	Corvallis
McGinnis, Iva Belle	Voice	Corvallis
Malcomson, Emily	Voice	Corvallis
Morgan, Beulah Inez	Piano	Corvallis
Morgan, Mary Palmer	Piano	Corvallis
Moses, Everett Allen	Cornet	Corvallis
Murphy, Mary Alice	Voice	Corvallis
Nolan, Gertrude	Piano	Corvallis
Oakes, Sylvia Alice	Voice, Piano	Gaston
Overholser, Violet Melissa	Piano	Corvallis
Porter, Mildred	Piano	Corvallis
Rondeau, Ruth Louella	Piano	Corvallis
Rulifson, Leroy Comstock	Voice	Corvallis
Smith, Elinor	Piano	Corvallis
Starr, Ruby Irene	Voice, Piano	Corvallis
St. Ledger, Virginia Lenore	Mandolin	Corvallis
Stoneberg, Reuben Leonard	Voice	Coburg
Thompson, Doris Weller	Piano	Corvallis
Tortos, Lena	Voice	Corvallis
Tracy, Ray Palmer	Voice, Piano	Condon
Thurston, Alice Elizabeth	Piano	Wellsdale
Wahlberg, Elizabeth	Piano	Corvallis
Watson, Margaret Bourne	Piano	Corvallis
Welch, Litta Christine	Piano	Corvallis
Wellsher, Marie Vivian	Piano	Corvallis
Williamson, Mary Susie	Piano	Corvallis
White, Esther	Violin	Philomath
Withycombe, Mabel Anne	Piano	Corvallis
Witzig, Ivy Emma	Piano	Corvallis
Yates, Golda Francis	Voice	Albany

WINTER SHORT COURSE STUDENTS

The following abbreviations are used to indicate the course in which the student registered: Agri., General Agriculture; Agron., Agronomy; A. H., Animal Husbandry; Bus. Meth., Business Methods; D. H., Dairy Husbandry; D. S., Domestic Science and Art; For., Forestry; Hort., Horticulture; Mech. Arts, Mechanic Arts; P. H., Poultry Husbandry.

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Abbott, A. E.	Agron.	Vernon, B. C.
Abbott, M. B.	Hort.	Portland
Alderson, E. R.	Hort.	Vernon, B. C.
Alexander, Mrs. Dave	D. S.	Corvallis
Alexander, E. H.	Hort.	Sheridan
Allen, Dr. Stanton	Hort.	Hood River
Allen, Mrs. Stanton	Hort.	Hood River
Allinger, Mrs. H. W.	D. S.	Corvallis
Allinger, H. W.	Hort.	Corvallis
Alphouse, W. A.	D. H.	LaPine
Anderson, A. M.	Bus. Meth.	Mt. Angel
Anderson, Henry J.	Agri.	Mt. Angel
Apgar, E. I.	Agron.	Hood River
Arbuthnot, S. H.	Bus. Meth.	Corvallis
Armstrong, C. E.	Agri.	Corvallis
Armstrong, Chas. H.	Hort.	Keremeos, B. C.
Arnold, B. M.	Hort.	British Columbia
Ashton, Charles	Agri.	Tangent
Bacon, Forsyth	A. H.	Amboy
Bagot, Arthur G.	Bus. Meth.	Quathiaski, B. C.
Baker, E. D.	Hort.	Medford
Banall, J. R.	Hort.	Hood River
Barber, Lawton	Bus. Meth.	Corvallis
Barker, Mrs. Blanche	Agri.	Empire
Barklow, Clarence M.	D. H.	Norway
Beaman, C. A.	For.	Scottsburg
Beck, Bertha J.	Bus. Meth.	Albany
Beck, J. O.	Agri.	Boise, Idaho
Bengough, Wm. L.	Hort.	Grimsby East, Ont.
Bernards, M.	Agri.	Forest Grove
Berylund, Alfred	D. H.	Colton
Biggar, H. H.	Agron.	Brookings, S. D.
Bixley, C. M.	Agri.	Freewater

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Blake, M. A.	Hort.	Portland
Blascynski, A.	Agri.	Lodz, Russia
Blodgett, George W.	Hort.	Hood River
Blohm, Theodore	Agri.	Portland
Bonner, J. C.	D. H.	Corvallis
Bosshart, Jacob	Bus. Meth.	Warrenton
Boyd, Edna	D. S.	Cottage Grove
Bozorth, Levi	Agri.	Amboy, Wn.
Breithaupt, Mrs. L. R.	D. S.	Burns
Brewster, C. S.	P. H.	Portland
Bristow, A.	D. H.	North Bend, Wash.
Brooker, A. M.	Agri.	Oregon City
Brown, D. E.	Agri.	Pleasant Hill
Brown, F. V.	Hort.	Dallas
Brown, J. R.	Agron.	Enterprise
Bruce, Robert C.	Hort.	White Salmon, Wash.
Brucker, Martin	Hort.	Roseburg
Brydon, James M.	Bus. Meth.	Victoria, B. C.
Busch, Wm. Clarence	Hort.	Parkdale
Butchart, Mrs. Sarah	D. S.	Hood River
Butchart, W. B.	Hort.	Hood River
Butchart, Mrs. W. B.	D. S.	Hood River
Butler, Floyd E.	Agron.	Toledo
Burton, Mrs. W.	D. S. A.	Corvallis
Calkins, C. C.	Agri.	Airlee
Capelle, Henry L.	Hort.	Hood River
Caragol, Joseph A.	Hort.	New York City
Carey, Alice	D. S.	Portland
Carl, Mrs. H. L.	D. S.	Myrtle Point
Carnie, N. C.	Agri.	Chicago, Ill.
Casteel, Edith Hazel	D. S.	Yaquina
Cator, B. P.	D. H.	Corvallis
Chandler, E. C.	Agri.	Sheridan
Chandler, G. L.	Agri.	Rogue River
Chandler, William A.	Hort.	Husum, Wash.
Chandler, Mrs. William A.	D. H.	Husum, Wash.
Chapin, C. H.	Hort.	Wren
Chase, H.	Hort.	Eugene
Chorpening, C. D.	Agri.	Klamath Falls
Christen, Theodore	Hort.	Hubbard
Clarke, Herbert H.	Hort.	Portland
Coleman, C. P.	Mech. Arts	Templeton
Coleman, Mrs. J. R.	Com.	Corvallis
Cone, Harry	Agri.	McMinnville
Cook, M. P.	Agri.	Portland

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Counet, Fred	Mech. Arts	Lebanon
Coursen, R. E.	Hort.	Portland
Crain, Charles	Agri.	Corvallis
Cummings, A. E.	Hort.	Salem
Dallas, Mrs. M. C.	D. S. & A.	Corvallis
Damon, Mrs. H. O.	D. S. & A.	Corvallis
Damon, Ruth	D. S. & A.	Corvallis
Davis, C. R.	Hort.	Freewater
Davidson, William	Hort.	Hood River
Dickinson, A. K.	Agron.	Oswego
Doerner, A. M.	Agri.	Grants Pass
Donovan, C. R.	Agri.	Dublin, Ireland
Dorlin, Frank P.	Agri.	Forest Grove
Dorsey, Edwin B.	Hort.	White Salmon, Wash.
Dryden, R. J.	D. H.	Corvallis
DuMoulin, Walter W.	Mech. Arts	Corvallis
Dyer, Henry C.	Hort.	Dallas
Eaton, Karl	Agri.	Yamhill
Eckerlen, Bertha	D. S.	Salem
Eldred, Ethel Cora	D. S.	Belmont, Mich.
Elliott, Robt.	Com.	Corvallis
Evans, Lee R.	A. H.	Mosier
Evans, M. D.	Hort.	Corvallis
Euwer, Eugene C.	Hort.	Parkdale
Farmer, Oliver	Agri.	Halsey
Fisher, Charles M.	Hort.	Buhl, Idaho
Fisher, Harry H.	Hort.	Buhl, Idaho
Fletcher, H. B.	Agron.	Independence
Fletcher, Mrs. H. B.	D. S.	Independence
Folks, Bert A.	D. H.	Junction City
Ford, George William	Bus. Meth.	Sheridan
Fortin, Fred	Hort.	Coles Valley
Frank, Herbert W.	Hort.	Hermiston
Fulton, Madge	D. S.	Astoria
Garrettson, E. J.	Agri.	Sioux City, Iowa
Gellatly, Robt. H.	Agron.	Philomath
Gibbs, J. C.	Agri.	Grace, Idaho
Gillet, Ira E.	Agri.	Albany
Gilmore, Mrs. L.	D. S.	Corvallis
Glaser, Wm.	Agri.	Corvallis
Goffrier, A. F.	Mech. Arts	McMinnville
Goldsbury, John	Agri.	Parkdale
Gragg, Mrs. Mary H.	D. S.	Monroe
Graham, S. C.	Hort.	White Salmon
Gray, Greta I.	D. S.	Corvallis
Green, Dan	Agri.	Parkdale

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Green, Howard H.	Mech. Arts	Parkdale
Greene, R. W.	Hort.	Winthrop, Wash.
Griffin, George W.	Mech. Arts	Fossil
Griffis, Stanton	Hort.	Medford
Griffis, Mrs. Stanton	D. S.	Medford
Griffith, Clyde	D. H.	Klamath Falls
Grimshaw, Mrs. Olive A.	D. S.	Phoenix, Ariz.
Hall, Lewis C.	Hort.	Fairfax, Vt.
Hall, W. R.	Agri.	Buena Vista
Hallack, T. H.	Hort.	Newport
Hallack, Mrs. T. H.	D. S.	Newport
Hanley, H. H.	Agri.	Post
Hanlin, Hugh Wright	Agri.	Underwood, Wash.
Hanson, Manette	D. S.	Corvallis
Harmon, Ruth	D. S.	North Bend
Harris, Earl S.	Com.	Corvallis
Harris, Lester P.	Hort.	Parkdale
Harris, Robert R.	Agri.	Nortons
Hart, Charles W.	Hort.	Hood River
Hartley, Mrs. Earl	D. S.	Corvallis
Hartsock, Mrs. S. K.	D. S.	Corvallis
Harvey, C. S.	Agri.	Milwaukee
Haseltine, Sarah	D. S.	Berkeley, Cal.
Hastings, Jessie M.	D. S.	Portland
Hawkins, Harold Fuller	Agron.	Salem
Hawkins, Thos. P.	Phar.	Toledo
Hayes, Sherman	Agron.	Newport
Henderson, Walter H.	Hort.	White Salmon, Wash.
Herse, Mrs. L.	D. S.	Corvallis
Herse, Mrs. H. L.	Agri.	Corvallis
Hetzel, H. C.	Agri.	Corvallis
Higginbotham, Mrs. Mary	D. S.	Corvallis
Hill, J. M.	A. H.	El Paso, Texas
Hill, Thomas E.	Agron.	Grants Pass
Hogan, Eli	D. H.	Corvallis
Holboke, Sophia	D. S.	Portland
Holcomb, Clyde	D. H.	Junction City
Hooper, Johnson	Agri.	Corvallis
Howe, Mrs. H. L.	D. S.	Hood River
Howe, Helen	D. S.	Hood River
Hoxick, H. M.	Hort.	Hood River
Huggins, C. C.	P. H.	Portland
Hurst, C. M.	Agri.	Oswego, Kans.
Ibach, John	Agri.	Banks
Jackson, George W.	Hort.	Medford

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Jaeger, Edwin	Agri.	Portland
Jamison, N. C.	Agron.	Puyallup, Wash.
Jensen, George	D. H.	Astoria
Jensen, William	Agri.	Junction City
Johns, Walter I.	Hort.	Myrtle Creek
Johnson, J. E.	Agri.	Portland
Johnson, James Goodwin	Hort.	Portland
Johnson, W. P.	Bus. Meth.	Klamath Falls
Johnston, F. H.	Hort.	Portland
Johnston, Theodore	Agri.	Moro
Jones, T. D.	Mech. Arts	Mountaindale
Jones, W. E.	Agron.	Milton
Joy, F. W.	Com.	North Bend, Wash.
Joyner, Leon	Hort.	Brooklyn, N. Y.
Keemer, Joe	Agri.	Astoria
Kellogg, Don G.	Agri.	Vancouver, B. C.
Kennedy, A. B.	Hort.	Hoquiam, Wash.
Kennedy, Mrs. C. B.	D. S.	Corvallis
Kennedy, J. E.	Hort.	Hood River
Kerr, Mrs. W. H.	Agri.	Roseburg
Kerr, Mrs. L. H.	Agri.	Corvallis
Kidd, James	Hort.	Kamloops, B. C.
Kilbourn, Mrs. Matilda R.	D. S.	Litchfield, Conn.
Kinney, George A.	Bus. Meth.	Harlan
Kinzenga, Eldred	P. H.	Oswego
Knoll, Pieter A.	Hort.	Moiser
Krebs, Mary T.	D. S.	Portland
Krebs, W. T.	Agri.	Portland
Kreps, Amy V.	D. S.	Laurel
Krusson, Oscar	Agri.	Hood River
Lane, J. H.	A. H.	Silver Lake
Lange, George	Agri.	Scappoose
Lapham, A. N.	Mech. Arts	Corvallis
Latourette, Kenneth Scoot	Agri.	Oregon City
Laubner, Emma	Bus. Meth.	Albany
Laubner, W. C.	Agri.	Albany
Lemmon, Charles C.	Hort.	Hood River
Leonard, Mary	Hort.	Corvallis
Lewis, Thos. M.	D. S.	Corvallis
Lewtas, John	Agri.	Tacoma, Wash.
Libby, Millard Alton	Hort.	Amity
Libour, Israel	Hort.	Portland
Lindeman, L. N.	Agri.	Monmouth
Lore, Henry K.	Hort.	Underwood, Wash.
Lovett, Mrs. A. L.	D. S.	Corvallis

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Lundquist, L. E.	D. H.	Dundee
McCabe, Wm. L.	Mech. Arts	Condon
McClure, J. E.	Agri.	Moro
McCormick, Andrew	Hort.	Lebanon
McCulloch, George	D. H.	Marshfield
McGee, Roy Oliver	A. H.	Airlie
McQuaid, Zena	D. S.	Portland
Macpherson, Wm. M.	Agri.	Pasadena, Cal.
Marsh, Donald	D. H.	Port Orford
Marsh, John R.	D. H.	Port Orford
Marsh, Louis	D. H.	Port Orford
Martin, W. J.	Com.	Corvallis
Masters, B. A.	Hort.	Portland
Masterton, Mrs. C. H.	D. S.	Corvallis
Masterton, David	Mech. Arts	Corvallis
Matsen, Thomas	Agri.	Junction City
Melton, James M.	Agri.	Portland
Metlock, Henry	Mech. Arts	Crawford
Meyer, Albert	Agri.	Corvallis
Miller, H. M.	Hort.	Portland
Miller, W. D.	Agri.	Aurora
Miller, W. D.	Mech. Arts	Aurora
Mills, A. E.	A. H.	Forest Grove
Milton, A. B.	Hort.	Burns
Montgomery, G. M.	Hort.	Alhambra, Cal.
Moody, A. A.	D. H.	Talent
Morehead, W. H.	Mech. Arts	Wahkiacus, Wash.
Moore, Raymond G.	Hort.	Underwood, Wash.
Murphy, Mrs. R.	D. S.	Corvallis
Murphy, W. H.	Agri.	Buena Vista
Narkans, Joseph	Bus. Meth.	Weston
Nash, Harold	D. H.	Oregon City
Neal, W. E.	For.	Nelson, Canada
Nerdrum, Thoralt	Hort.	Roseburg
Newcomb, Gilbert R.	For.	Campbell
Newsom, S. J.	Agron.	Prineville
Noren, Albin	Agri.	Reedley, Cal.
O'Neil, J. W.	Hort.	Corvallis
Osburn, Mrs. Margaret	D. S.	Corvallis
Paddleford, Mr.	Agri.	Carey, Idaho
Padgham, H. I.	Hort.	Santa Ana, Cal.
Parker, George K.	A. H.	Roseburg
Patterson, Frederic	Hort.	Hood River
Pearcy, H. L.	Agri.	Portland
Peck, Mrs. Arthur L.	D. S.	Corvallis

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Peery, W. K.	D. H.	Corvallis
Penland, Nell	D. S.	Sheridan
Peterson, Freda	D. S.	Eagle Point, Minn.
Plog, Walter	A. H.	Hood River
Powell, C. K.	Agron.	Payette, Idaho
Powell, W. L.	P. H.	Los Angeles, Cal.
Purcell, C. H.	Agri.	Portland
Rae, R. J.	Hort.	Medford
Ranchfuss, Edwin C.	Hort.	Brooklyn, N. Y.
Reimers, Edward	Agri.	Drain
Rearden, Mrs. J. E.	D. S.	Corvallis
Reynolds, R. E.	A. H.	La Grande
Reynolds, Mrs. R. E.	D. S.	La Grande
Richard, Vena	D. S.	Corvallis
Richards, Mrs. R. H.	D. S.	Portland
Robbins, Adah	D. S.	Corvallis
Rohwein, John	A. H.	Scio
Rollins, J. C.	Agri.	Corvallis
Rollins, Ralph T.	Bus. Meth.	Corvallis
Rondeau, Ruth	D. S.	Corvallis
Rothenberg, P. W.	Agri.	Pasadena, Cal.
Rousseau, Alax	D. H.	San Rafael, Cal.
Sammis, T. A.	Hort.	The Dalles
Samuelson, Archer	Agri.	Brownsville
Sanders, G. F.	Agri.	The Dalles
Sawtell, Elmer	Bus. Meth.	Molalla
Sawyer, Lewis	Mech. Arts	Gervais
Sawyer, Louis	A. H.	Salem
Schaffner, Fritz	Hort.	Beaverton
Schmidlin, Charles	Agri.	Buxton
Shemidt, F. C.	D. H.	Salem
Shuster, C. E.	Hort.	Corvallis
Scott, R. S.	P. H.	Portland
Sexton, Margaret	Bus. Meth.	Flathead
Shields, Eva	D. S.	Milton
Shinn, R. E.	Agri.	Albany
Slavin, J. A.	D. H.	N. Yakima, Wash.
Small, George H.	Agri.	Silver Lake
Small, Lora M.	Agri.	Silver Lake
Smith, J. A.	Agri.	Blalock
Smith, Willis B.	Hort.	New York City
Somers, G. B.	Agri.	Hermiston
Squires, Ralph	Agri.	Bellingham, Wash.
Starker, Carl	Hort.	Corvallis
Stauff, O. B.	D. H.	Cooston

<i>Name</i>	<i>Course Rank</i>	<i>Home Address</i>
Stauff, V. H.	D. H.	Cooston
Steininger, B. H. M.	Agri.	Molalla
Steininger, John H.	Agron.	Molalla
Stickney, Harry F.	D. H.	Underwood, Wash.
Sterling, Agnes	Com.	Burns
Stocker, R. L.	Agri.	Vernon, England
Stout, Thoron	D. S.	Fairdale
Streib, Phil	D. H.	Corvallis
Supple, Joe	Agri.	Portland
Swan, Carl	Agron.	Turlock
Tartar, Mrs. N.	D. S.	Corvallis
Taylor, Mrs. Effie	D. S.	Medford
Taylor, Gertie	D. S.	Albany
Thielin, Leo M.	Hort.	Hood River
Torgersen, K. A.	Agri.	Astoria
Vail, J. L.	P. H.	Corvallis
Vanderwall, R. E.	Agri.	Haines
Vollstedt, William	Agri.	Lebanon
Von Wirdner, H. R.	Hort.	Canby
Walker, Mr. E. H.	D. H.	Corvallis
Walker, Harry E.	Agron.	Monmouth
Weaver, Harold	Agri.	Enterprise
Webster, M. A.	Hort.	Alpine
Wedemeyer, O. T.	Hort.	Hood River
Wendover, Royce Franklin	For.	Stockton, Kans.
White, Bennie M.	Bus. Meth.	Scotts Mills
White, Harry Bernard	D. H.	Ashland
Wigle, Mrs. Laura	D. S.	Corvallis
Wilcox, Donald F.	Hort.	Lamarda Park, Cal.
Wilkie, Gordon Byron	D. H.	Montesan, Wash.
Wilkins, Mrs. Eunice	D. S.	Corvallis
Williams, Herbert	Hort.	White Salmon, Wash.
Williams, Mrs. Herbert	Hort.	White Salmon, Wash.
Williamson, Lowell	A. H.	LaGrande
Wilson, J. B.	Agron.	Corvallis
Wilson, James Morgan	Hort.	Oswego
Wodth, G.	Hort.	Foster
Wolfe, John B.	Hort.	Corvallis
Wooden, Stewart L.	D. H.	Elizabeth, N. J.
Woodwards, Harry L.	Agron.	Salem
Wright, J. Nash	Hort.	Woodsock, Wash.

SPECIAL COURSE IN DOMESTIC SCIENCE AND ART.

Beckwith, Mrs. T. D.	Corvallis
Bement, Edna	Corvallis
Blomwick, Miss I.	Corvallis
Buxton, Mrs. W. H.	Corvallis
Damon, Mrs. H.	Corvallis
Dilley, Mrs. E. J.	Corvallis
Egbert, Alice	Corvallis
Gamble, Ella	Astoria
Gollihur, Mrs. W. A.	Corvallis
Gross, Maude	Corvallis
Haight, Mrs. K. B. L.	Corvallis
Harmon, Ruth	North Bend
Harry, Mrs. T. F.	Corvallis
Hess, Maude	Corvallis
Jackson, Mrs. H. S.	Corvallis
Johnson, Mrs. W. T.	Corvallis
Law, Turah	Corvallis
Lawrence, Mrs. W. E.	Corvallis
Lewis, Lucy	Corvallis
McClain, Mrs. Chas.	Corvallis
McMillan, Katherine	Corvallis
Macpherson, Mrs. H.	Corvallis
Masterton, Mrs. C. H.	Corvallis
Peavy, Mrs. G. W.	Corvallis
Peck, Mrs. A. L.	Corvallis
Prather, Mrs. J. M.	Corvallis
Shepard, Mrs. E. R.	Corvallis
Sterling, Bertha	Corvallis
Sykes, Clara	Corvallis
Peterson, Marie	Corvallis
Plock, Carolyn	Corvallis
Robbins, Adah	Corvallis
Signs, Mrs. Alice	Corvallis
Thayer, Miriam	Corvallis
Turner, Kittie	Corvallis
Wallace, Grace	Independence
Wintler, Miss	Corvallis

SUMMARIES*

CLASSIFIED AS TO COURSE.

AGRICULTURE—	
Regular 36-week courses	429
Short courses	1057
FORESTRY—	
Regular 36-week courses	67
Short courses	3
DOMESTIC SCIENCE AND ART—	
Regular 36-week courses	270
Short courses	435
CIVIL ENGINEERING—	
Regular 36-week courses	67
ELECTRICAL ENGINEERING—	
Regular 36-week courses	83
MECHANICAL ENGINEERING—	
Regular 36-week courses	129
Short courses	12
MINING ENGINEERING—	
Regular 36-week courses	20
COMMERCE—	
Regular 36-week courses	143
Short courses	15
PHARMACY—	
Regular 36-week courses	51
OPTIONAL—	
Regular 36-week courses	59
MUSIC ONLY—	
Regular courses in music	62
SUMMER SCHOOL—	
Summer term of six weeks	98
	2984
Deduct duplicates	670
Total excluding duplicates	2314

*The enrollment statistics include those only who have pursued work at the the College; correspondence students are omitted.

CLASSIFIED AS TO RESIDENCE

STATES OR TERRITORIES—

Oregon	2507
Alabama	1
Alaska	6
Arizona	3
California	115
Colorado	1
Connecticut	2
Delaware	3
District of Columbia	1
Idaho	34
Illinois	13
Indiana	2
Iowa	7
Kansas	4
Kentucky	4
Louisiana	1
Maine	1
Massachusetts	6
Michigan	4
Minnesota	6
Missouri	2
Montana	3
Nebraska	3
New Hampshire	1
New Jersey	3
New Mexico	4
New York	20
North Carolina	1
North Dakota	1
Ohio	4
Oklahoma	7
Pennsylvania	2
South Dakota	4
Texas	3
Utah	2
Vermont	3
Washington	135
Wisconsin	2
Wyoming	1

FOREIGN COUNTRIES—

Armenia	1	
Canada	23	
China	7	
Hawaii	7	
India	8	
Ireland	4	
Japan	6	
Mexico	3	
Poland	1	
Russia	2	
		<hr/> 62
Total		2984
Duplicates		670
		<hr/>
Total, excluding duplicates		2314

COMPARATIVE ENROLLMENT

1888-1889	97
1889-1890	151
1890-1891	201
1891-1892	208
1892-1893	282
1893-1894	240
1894-1895	261
1895-1896	397
1896-1897	316
1897-1898	336
1898-1899	338
1899-1900	405
1900-1901	436
1901-1902	488
1902-1903	541
1903-1904	530
1904-1905	680
1905-1906	735
1906-1907	833
1907-1908	1156
1908-1909	1352
1909-1910	1591
1910-1911	1778
1911-1912	2868
1912-1913	2314

The great difference in the total enrollment for the two years, 1910-11 and 1911-12, was due largely to the increase in the number

of students registered for the winter short courses in Agriculture. The increase in the number of regular students in the 36-week courses was 24 per cent.

The decrease in the number of students in 1912-13 from the year 1911-12 is due to the decrease in the short course registration. The increase in the number of regular students for the 36-week courses is 19 per cent.

NOTE.—In addition to the above listed names, out of a total of 1,140 students registered in the Farmers' Week courses in Agriculture and Domestic Science and Art, the names of 605 students who were registered in these courses, but in no other College courses, do not appear.

COMMENCEMENT, 1913.

DEGREES CONFERRED JUNE, 1913.

BACHELOR OF SCIENCE IN—

Agriculture	35	
Forestry	2	
Domestic Science and Art	21	
Civil Engineering	7	
Electrical Engineering	12	
Mechanical Engineering	2	
Mining Engineering	3	
Commerce	12	
Pharmacy	3	
	—	97

MASTER OF SCIENCE IN—

Agriculture	2	
	—	2

CERTIFICATES IN—

Music	3	
Pharmacy Short Course	2	
	—	5

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HONOR STUDENTS.

Honor students, at graduation, are selected on a basis of pre-eminence in both class work and student activities. All courses are represented by honor students, the representation being on the basis of one honor student to every ten seniors in each degree course. No student, however, will be named in the honor list

whose merit grade is below seventy-five. The selection is made jointly by faculty and students.

AGRICULTURE—Ralph Abel Blanchard, Ernest Walton Curtis, Harry Clayton Hetzel, D. Brooks Hogan.

FORESTRY—Walt LeRoy Dutton.

DOMESTIC SCIENCE AND ART—Helen Julia Cowgill, Alice Marie Cathey.

CIVIL ENGINEERING—Francis Willard Smith.

ELECTRICAL ENGINEERING—Leonard Humphrey Kistler.

MECHANICAL ENGINEERING—Frederick Carl Jernstedt.

MINING ENGINEERING—Rowley Cruit.

COMMERCE—Arthur James Wilson.

PHARMACY—Thomas Hawkins.

WALDO PRIZES.

The Clara H. Waldo Prizes are awarded on a basis of both scholarship and general achievement as follows: (a) Proficiency in literary and scholastic attainments; (b) Success in student activities; (c) Qualities of womanhood; (d) Qualities of leadership. The selection is made by a joint arrangement between faculty and students. To the senior woman selected, a prize of forty dollars is awarded; to the junior woman, thirty dollars; to the sophomore woman, twenty dollars; and to the freshman woman, ten dollars. Students receiving second and third places in each class are given honorable mention.

PRIZES.

Senior—Lucy Crawford.

Junior—Katherine Warner.

Sophomore—Abbie Coon.

Freshman—Kareen Hansen.

HONORABLE MENTION.

Seniors—Anna Johnson, Helen Cowgill.

Juniors—Ruth Hawley, Lillian Thordarson.

Sophomores—Lorene Parker, Enid Leeper.

Freshmen—Geraldine Newins, Edith Crockatt.

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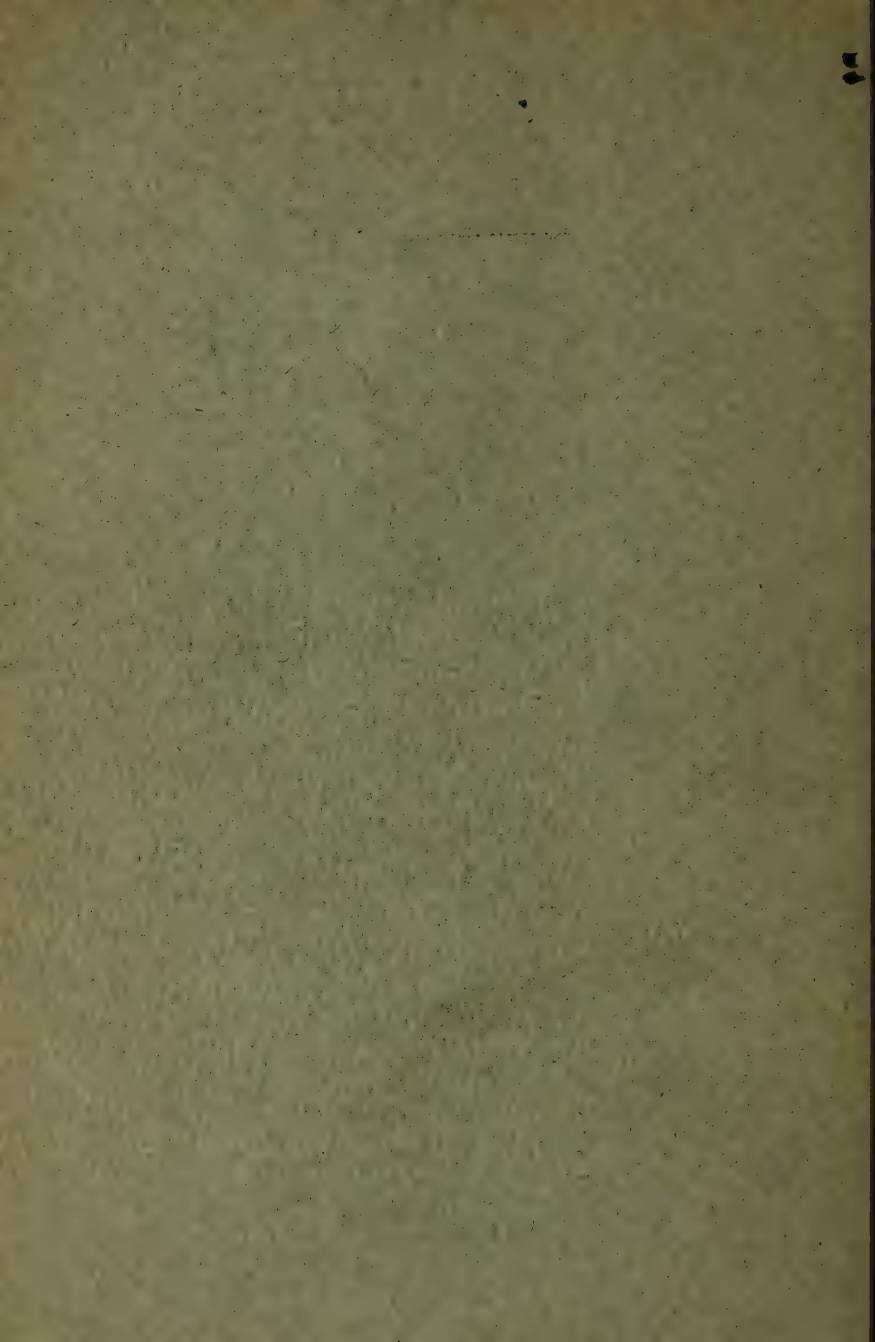
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COLLEGE BULLETIN

ISSUED MONTHLY

NUMBER 161

OF THE
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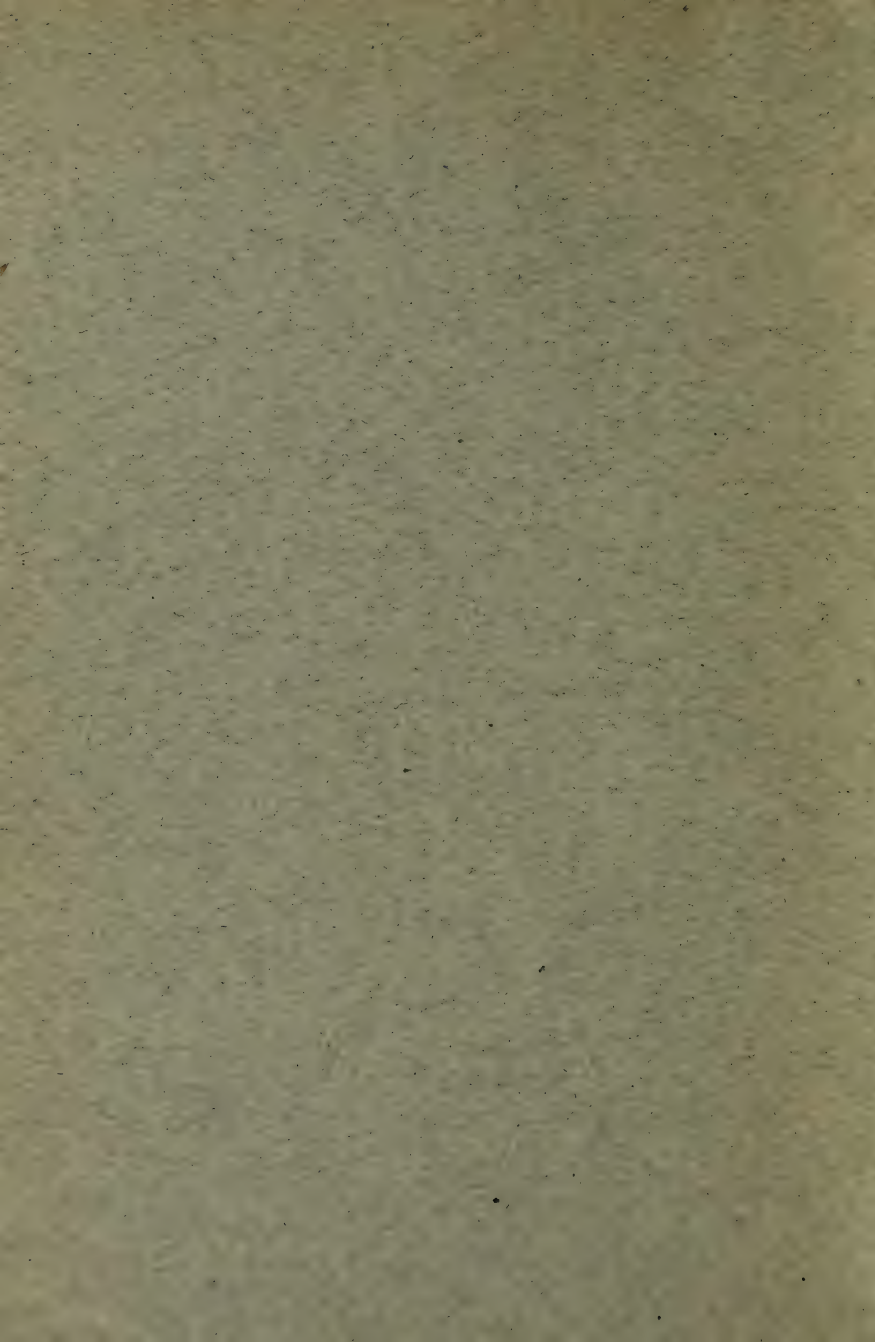
1914-15

WITH LIST OF STUDENTS FOR 1913-14



CORVALLIS, OREGON

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1914-15

With List of Students for 1913-14



CORVALLIS, OREGON

JULY, 1914

SALEM, OREGON :
STATE PRINTING DEPARTMENT
1914

CALENDAR, 1914

JULY								AUGUST								SEPTEMBER							
S	M	T	W	T	F	S		S	M	T	W	T	F	S		S	M	T	W	T	F	S	
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12	13	14	15	16	17	18		9	10	11	12	13	14	15		13	14	15	16	17	18	19	
19	20	21	22	23	24	25		16	17	18	19	20	21	22		20	21	22	23	24	25	26	
26	27	28	29	30	31			23	24	25	26	27	28	29		27	28	29	30				
								30	31														

OCTOBER								NOVEMBER								DECEMBER								
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18	19	20	21	22	23	24		22	23	24	25	26	27	28		20	21	22	23	24	25	26		
25	26	27	28	29	30	31		29	30							27	28	29	30	31				

CALENDAR, 1915

JANUARY							FEBRUARY							MARCH						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
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10	11	12	13	14	15	16	14	15	16	17	18	19	20	14	15	16	17	18	19	20
17	18	19	20	21	22	23	21	22	23	24	25	26	27	21	22	23	24	25	26	27
24	25	26	27	28	29	30	28							28	29	30	31			
31																				

APRIL							MAY							JUNE						
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4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
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							30	31												

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1914-15

COLLEGE CALENDAR 1914-15

1914

September 18, 19, 21, Friday, Saturday, Monday—Registration and examination for admission.

September 22, Tuesday—Recitations begin.

October 9, Friday—Quarterly meeting Board of Regents.

November 2, Monday—Forestry short course begins.

November 25, 26, 27, 28, Wednesday (noon), Thursday, Friday, Saturday—Thanksgiving recess.

November 30 to December 5 (noon)—Farmers' Week.

December 19, Saturday (noon)—Christmas recess begins.

1915

January 4, Monday—Regular exercises resumed.

Winter short course begins.

January 6, Wednesday—Quarterly meeting Board of Regents.

January 30, Saturday—Winter short course ends.

February 1, 2, 3, 4, Monday, Tuesday, Wednesday, Thursday—First semester examinations.

February 4, Thursday—First semester ends.

February 9, Tuesday—Second semester begins.

April 7, Wednesday—Quarterly meeting Board of Regents.

April 16, Friday—Forestry short course ends.

May 7, Friday—Military inspection.*

May 22, Saturday—Interscholastic Field and Track Meet.

May 30, Friday—Decoration Day, legal holiday.

May 31, June 1, 2, 3, 4, Monday, Tuesday, Wednesday, Thursday, Friday—Second semester examinations.

June 6, Sunday—Baccalaureate exercises.

June 7, Monday—Alumni and Graduating Class exercises.

June 7, Monday—Quarterly meeting Board of Regents.

June 8, Tuesday—Commencement exercises.

June 14, Monday—Summer School begins.

*Subject to change.

BOARD OF REGENTS
OF THE
OREGON AGRICULTURAL COLLEGE
AND
EXPERIMENT STATION

OFFICERS

HON. J. K. WEATHERFORD, President	Albany
HON. E. E. WILSON, Secretary	Corvallis
HON. B. F. IRVINE, Treasurer	Portland

EX-OFFICIO MEMBERS

HON. OSWALD WEST, Governor of the State	Salem
HON. BEN W. OLCOTT, Secretary of State	Salem
HON. J. A. CHURCHILL, Supt. of Public Instruction.....	Salem
HON. CHARLES E. SPENCE, Master of State Grange, Oregon City	

APPOINTED BY THE GOVERNOR

	Term Expires
MRS. CLARA H. WALDO	Portland, 1915
HON. E. E. WILSON	Corvallis, 1915
HON. B. F. IRVINE	Portland, 1915
HON. J. T. APPERSON	Parkplace, 1918
HON. J. K. WEATHERFORD	Albany, 1918
HON. C. L. HAWLEY	McCoy, 1918
HON. WALTER M. PIERCE	La Grande, 1921
HON. H. VON DER HELLEN	Wellen, 1921
HON. GEO. M. CORNWALL	Portland, 1921

STANDING COMMITTEES
OF THE
BOARD OF REGENTS

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C. E. Spence, W. M. Pierce.

FINANCE COMMITTEE

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COLLEGE COMMITTEE

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W. M. Pierce, Chairman; H. Von der Hellen, C. E. Spence.

FORESTRY

Geo. M. Cornwall, Chairman; Oswald West, Ben W. Olcott

EXTENSION COMMITTEE

J. A. Churchill, Chairman; C. L. Hawley, C. E. Spence,
H. Von der Hellen, Oswald West.

OFFICERS OF ADMINISTRATION AND INSTRUCTION

(Arranged in groups in the order of seniority of appointment)

ADMINISTRATIVE COUNCIL

WILLIAM JASPER KERR, D. Sc.,
President.

ARTHUR BURTON CORDLEY, M. S.,
Dean of the School of Agriculture.
Director of the Agricultural Experiment Station.

GRANT ADELBERT COVELL, M. E.,
Dean of the School of Engineering and Mechanic Arts
Professor of Mechanical Engineering.

JOHN ANDREW BEXELL, A. M.,
Dean of the School of Commerce
Professor of Business Administration.

EDWIN DEVORE RESSLER, A. M.,
Director of the Summer School.
Professor of Industrial Pedagogy.

ANNA ZOU CRAYNE, A. B., M. D.,*
Dean of Women.

HENRIETTA WILLARD CALVIN, S. B.
Dean of the School of Home Economics.
Professor of Domestic Science.

RALPH DORN HETZEL, A. B., LL. B.,
Director of Extension Service.

HENRY MARTIN PARKS, B. S., E. M.,
Dean of the School of Mines.

*Resigns September 1, 1914.

GEORGE WILCOX PEAVY, M. S. F.

Dean of the School of Forestry.

COLLEGE COUNCIL

(The members of the Administrative Council are also members of the College Council.)

FREDERICK BERCHTOLD, A. M.,

Professor of the English Language and Literature.

JOHN B. HORNER, A. M., Litt. D.,

Professor of History.

GORDON VERNON SKELTON, C. E.,

Professor of Civil and Highway Engineering.

JOHN FULTON, M. S.,

Professor of General and Analytical Chemistry.

THOMAS HENRY CRAWFORD, A. M.,*

Professor of Commercial Law.

CLAUDE ISAAC LEWIS, M. S. A.,

Vice-Director of the Agricultural Experiment Station.

Professor of Horticulture.

CHARLES LESLIE JOHNSON, B. S.,

Professor of Mathematics.

JAMES DRYDEN,

Professor of Poultry Husbandry.

HENRY DESBOROUGH SCUDDER, B. S.,

Professor of Agronomy.

WILLIAM FREDERIC GASKINS, B. S.,

Professor of Music.

WILLIAM ARTHUR JENSEN,

Recorder of the Faculties

Secretary to the President.

*On leave of absence.

FARLEY DOTY McLOUTH, B. S.,
Professor of Art.

WILLIBALD WENIGER, Ph. D.,
Professor of Physics.

HERBERT SPENCER JACKSON, A. B.,
Professor of Botany and Plant Pathology.

LOUIS BACH, M. A.,
Professor of Modern Languages.

IDA ANGELINE KIDDER, A. B., B. L. S.,
Librarian.

ERMINE LAWRENCE POTTER, B. S.,
Professor of Animal Husbandry.

THEODORE DAY BECKWITH, M. S.,
Professor of Bacteriology.

WILLIAM ARTHUR HILLEBRAND, A. B.,
Superintendent of Light and Power.
Professor of Electrical Engineering.

HELEN BRYCE BROOKS,
Professor of Domestic Art.

EDWARD JAMES STEWART, M. D.,
Director of Athletics.
Professor of Physical Education for Men.

MIRIAM THAYER, A. B.,
Professor of Physical Education for Women.

PETER JOHN HENNESSEY, 1st Lieut. 15th U. S. Cavalry.
Commandant of Cadets.
Professor of Military Science and Tactics.

HECTOR MACPHERSON, Ph. D.,
Professor of Economics.

HARLEY FROST WILSON, M. S.,
Professor of Entomology.

ULYSSES GRANT DUBACH, Ph. D.,
Professor of Political Science.

ROY RALPH GRAVES, M. S.,
Professor of Dairy Husbandry.

IRA ABRAHAM WILLIAMS, M. S., A. M.,
Professor of Ceramics.

HENRY CLAY BRANDON, A. M.,
Director of Shops.
Professor of Industrial Arts.

GEORGE T. COLLINS,
Manager Business Office

RICHARD HAROLD DEARBORN, M. E.,
Professor of Electrical Engineering.

FRED LLEWELLYN GRIFFIN, M. S.,
Professor of Agricultural Education.

GEORGE FRANCIS SYKES, M. S.,
Professor of Zoology and Physiology.

BENNETT THOMAS SIMMS, D. V. M.,
Professor of Veterinary Medicine.

THOMAS ANDERSON HENDRICKS TEETER, B. S.,
Professor of Irrigation Engineering.

SAMUEL HERMAN GRAF, M. S.,
Professor of Experimental Engineering.

VICTOR RAY GARDNER, M. S.,
Associate Professor of Pomology.

MARK CLYDE PHILLIPS, B. M. E.,
Superintendent of Heating.
Associate Professor of Mechanical Engineering

ARTHUR LEE PECK, B. S.,
Superintendent of Campus and Greenhouses.
Associate Professor of Landscape Gardening and Floriculture.

EDWIN THOMAS REED, B. S., A. B.,
College Editor.

GEORGE ROBERT HYSLOP, B. Sc.,
Associate Professor of Crop Production.

HERMAN VANCE TARTAR, B. S.,
Associate Professor of Agricultural Chemistry.

GURDON MONTAGUE BUTLER, E. M.,
Associate Professor of Mining Engineering.

RENTON KIRKWOOD BRODIE, M. S.,
Associate Professor of General Chemistry.

IDA BURNETT CALLAHAN, B. S.,
Assistant Professor of English Language and Literature.

NICHOLAS TARTAR, B. S.,
Assistant Professor of Mathematics.

ARTHUR GEORGE BOUQUET, B. S.,
Assistant Professor of Vegetable Gardening.

HAROLD MANLEY TENNANT,
Registrar.

AVA BERTHA MILAM, Ph. B., A. M.,
Assistant Professor of Domestic Science.

EDGAR RAYMOND SHEPARD, A. M.,
Assistant Professor of Electrical Engineering.

WILBUR LOUIS POWERS, M. S.,
Assistant Professor of Irrigation and Drainage.

MERRIS MICKEY McCOOL, Ph. D.,*
Assistant Professor of Soils.

EDWARD BENJAMIN BEATY, B. S.,
Assistant Professor of Mathematics.

HAROLD STEPHENSON NEWINS, Ph. B., M. F.,
Assistant Professor of Forestry.

MILO REASON DAUGHTERS, A. M.,
Assistant Professor of Organic Chemistry.

ALFRED GUNN LUNN, B. S.,
Assistant Professor of Poultry Husbandry.

CLYDE INSLEY BLANCHARD, A. B.,
Assistant Professor of Stenography.

ELMER JAY BROWN, Ph. D.,
Assistant Professor of Economics.

OTTO GERALD SIMPSON, B. S.,
Assistant Professor of Dairy Manufacturing.

REX EARL EDGECOMB, B. S.,
Assistant Professor of Civil Engineering.

FAY HARRY ROSENCRANTS, B. S.
Assistant Professor of Mechanical Engineering.

ANNIE LOIS ROBINSON, B. S.,
Assistant Professor of Domestic Art.

SIGURD HARLAN PETERSON, B. A.,
Assistant Professor of English.

CARL HAROLD KENNEDY, B. S.,
Assistant Professor of Animal Husbandry.

*Resigns August 1, 1914.

FACULTY

(The members of the Administrative and College Councils are also members of the Faculty.)

HARRY LYNDEN BEARD, B. S.,
Director of Cadet Band.
Instructor in Mathematics.

LOREN BURTON BALDWIN, A. M.,
Instructor in English.

WILLIAM McCAULLY PORTER,
Instructor in Forging.

CARL LAFAYETTE KNOPF, M. E.,
Instructor in Experimental Engineering.

GENEVIEVE BAUM-GASKINS,
Instructor in Pipe Organ and Piano.

GERTRUDE EWING McELFRESH, A. B.,
Instructor in English.

ALICE LEORA EDWARDS, B. S.,
Instructor in Zoology and Physiology.

JAMES GEORGE ARBUTHNOT, B. S.,
Instructor in Physical Education for Men.

MAY BABBITT-RESSLER,
Instructor in Piano.

GEORGE ROY SAMSON, B. S., A. B.,
Instructor in Animal Husbandry.

EDITH CARTER KUNEY, A. B.,
Instructor in Modern Languages.

WILLIAM EVANS LAWRENCE, B. S.,
Instructor in Botany.

LAWRENCE FISHER WOOSTER, B. S.,
Instructor in Electrical Engineering.

SAMUEL MICHAEL PATRICK DOLAN, C. E.,
Instructor in Civil Engineering.

ARTHUR MATHIAS SWARTLEY, B. S., M. E.,
Instructor in Mining Engineering.

LUCY MAY LEWIS, A. B., B. L. S.,
Library Cataloguer.

AMBROSE ELLIOTT RIDENOUR, B. S.,
Instructor in Foundry Practice.

EDGAR PERKINS WALLS, M. S.,
Instructor in Botany.

EDGAR ROSS STOCKWELL, B. S.,
Instructor in Dairy Husbandry.

CHARLES GEORGE WILTSHIRE,
Instructor in Plumbing and Steam Fitting.

CHARLES ELMER OWENS, M. A.,
Instructor in Botany.

ERWIN BERTRAN LEMON, B. S.,
Instructor in Commerce.

FLOYD ROWLAND, B. S.,*
Instructor in Chemistry.

JOSEPH BENJAMIN YODER, B. S.,
Instructor in Mechanical Drawing.

ALICE MARKS DOLMAN, M. S.,
Instructor in Domestic Science.

WILLIAM ALFRED BEVAN, B. S.,
Instructor in Physics.

*On leave of absence.

QUEEN INEZ JOHNSON,
Instructor in Music.

HILDA MILLER, B. S.,
Instructor in Chemistry.

SARAH LOUISE LEWIS,
Instructor in Domestic Science.

GILBERT BRUCE BLAIR, A. M.,
Instructor in Physics.

CAROLYN MARJORIE PLOCK,
Instructor in Physical Education for Women.

EMIL MARK DIEDRICH BRACKER, B. S.,
Instructor in Farm Mechanics.

GEORGE EDWARD GOODSPEED, Jr., B. S.,
Instructor in Mining Engineering.

HARVEY GODFREY McCOMB,
Instructor in Patternmaking.

KATHERINE MONELL HITCHCOCK.
Instructor in Domestic Art.

DARWIN GREENE THAYER, B. S.,
Instructor in Mechanical Engineering.

SIDNEY WILLIS FRENCH, E. Met.,
Instructor in Mining Engineering.

RUTH McNARY SMITH, B. S.,
Instructor in Domestic Science.

JOHN HARRISON BELKNAP, B. S.,*
Instructor in Physics.

BARBARA MOORE, B. S.,*
Instructor in Domestic Art.

GRACE CHRISTINE ROSAAEN,
Instructor in English.

*On leave of absence.

LILLIAN MABEL GEORGE,
Cataloguer in Library.

IRVINE HILL BLAKE, A. M.,
Instructor in Zoology and Physiology.

CATHERINE STUART VANCE, A. M.,
Secretary of College Y. W. C. A.
Instructor in English.

ORAN MILTON NELSON, B. S.,
Instructor in Animal Husbandry.

WINFRED McKENZIE ATWOOD, Ph. D.,
Instructor in Botany and Plant Pathology.

LYLE VALLINGTON HENDRICKS, Ph. D.,
Instructor in Pharmacy.

GEORGE DIACK HORTON, M. S.,
Instructor in Bacteriology.

MILTON JOHN SEELEY, Ph. C.,
Instructor in Chemistry.

RAYMOND ADAMS DUTCHER, M. S., A. M.,
Instructor in Agricultural Chemistry.

ALLISON MORRIS WOODMAN, B. S.,
Orchard Foreman.
Instructor in Horticulture.

EDNA MAY FLARIDA,
Instructor in Art.

JEANNE LEROUX, A. B.,
Instructor in Modern Languages.

WARREN PORTER TUFTS, M. S.,
Instructor in Horticulture.

LAWRENCE EUGENE ROBINSON, B. S.,
Instructor in Architecture.

ASA CHANDLER, Ph. D.,
Instructor in Zoology and Physiology.

CHARLES JUNIOUS CONOVER, M. S.,
Instructor in Forestry.

CHESTER MAXEY, A. M.,
Instructor in Economics and Political Science.

NEIL BURTON BALDWIN,
Instructor in Stenography.

JOHN EDWARD COOTER, B. S.,
Instructor in Agronomy.

HELEN PEER,
Instructor in Domestic Art

CHARLOTTE LEWIS,
Instructor in Physical Education for Women.

ETHEL CLEAVES,
Instructor in Physical Education for Women.

RUSSELL MARION HOWARD, B. S.,
Instructor in Accounting and Economics.

CHRISTIE MOORE, B. S.,
Instructor in Domestic Science.

CORINNE BLOUNT, B. M.,
Instructor in Piano.

E. HELLIER-COLLENS,
Instructor in Stringed Instruments.

RAY BOALS, B. S.,
Instructor in Experimental Engineering.

RACHAEL WEBB HAIGHT,*
Assistant in Library.

*Resigns September 1, 1914.

BERTHA HERSE, B. S.,*

Assistant in Library.

GODFREY VERNON COPSON, M. S.,*

Assistant in Bacteriology.

CYRUS FRANKLIN DUGGER,

Assistant in Military Science.

DOROTHY KEATLEY, B. S.,

Assistant in Domestic Art.

GEORGE HAROLD GODFREY, B. S.,

Assistant in Botany and Plant Pathology

BERT TREW JORDAN, B. S.,

Assistant in Chemistry.

LILA GRACE DOBELL, B. S.,

Assistant in Library.

GEORGE H. ROACH, A. B.,

Assistant in Library.

OLIVIA POHLAND-SCHILLING, B. S.,

Assistant in Domestic Art.

ROY EDGAR MARSHALL, B. S.,

Teaching Fellow in Horticulture.

JESSE HARRISON CORSAUT, B. S.,

Teaching Fellow in Botany.

CHRISTOPHER MARION SCHERER, A. B.,

Teaching Fellow in Botany.

HAROLD WILSON HYLAND, B. S.,

Teaching Fellow in Zoology.

CLARA NIXON, B. S.,

Research Fellow in Poultry Husbandry and Chemistry.

*On leave of absence.

EXTENSION SERVICE STAFF

WILLIAM JASPER KERR, D. Sc.,
President.

RALPH DORN HETZEL, A. B., LL. B.,
Director.

HIRAM TAYLOR FRENCH, M. S.,
State Leader of County Agricultural Agents.

FRED LLEWELLYN GRIFFIN, M. S.,
State Leader of Industrial Clubs.

GORDON VERNON SKELTON, C. E.,
Professor of Highway Engineering.

HECTOR MACPHERSON, Ph. D.,
Professor of Economics.

LULIE WILES ROBBINS, B. S.,
Assistant Professor of Home Economics.

WALTER SHELDON BROWN, A. B., M. S.,
Assistant Professor of Horticulture.

EDWARD BLODGETT FITTS,
Assistant Professor of Animal and Dairy Husbandry.

JOHN ELMER LARSON, B. S.,
Assistant Professor of Agronomy.

WILLIS ARCHER BARR, B. S.,
Field Dairyman.

RALPH ELMER REYNOLDS, M. S.,
Assistant Professor of Animal Husbandry.

PAUL MEREDITH COLLINS, A. B.,
Secretary.

CHARLES CHAUNCEY LAMB, B. S.,
Instructor in Poultry Husbandry.

SUMNER JOHN DAMON, B. S.,
Assistant Field Dairyman.

CHARLES JARVIS McINTOSH, B. S.,
Editor of Press Bulletins.

LEROY BREITHAUPT, B. S.,
Agricultural Agent for Harney County.

MAX ADAMS McCALL, B. S.,
Agricultural Agent for Klamath County.

CLAUDE CLIFTON CATE, B. S.,
Agricultural Agent for Union County.

LUTHER J. CHAPIN, B. S.,
Agricultural Agent for Marion County.

WILLIAM RICKETTS SHINN, B. S.,
Agricultural Agent for Malheur County.

FLOYD RADER, B. S.,
Agricultural Agent for Lane County.

ROY C. JONES, B. S.,
Agricultural Agent for Tillamook County.

JAY L. SMITH, B. S.,
Agricultural Agent for Coos County.

AMOS E. LOVETT, B. S.,
Agricultural Agent for Crook County.

JESSE RAY FLEMING, B. S.,
Assistant Agricultural Agent for Harney County.

F. C. REIMER, M. S.,
Agricultural Agent for Jackson County.

M. P. HENDERSON, Ph. D.,
Assistant Agricultural Agent for Jackson County.

STAFF OF AGRICULTURAL EXPERIMENT STATION

WILLIAM JASPER KERR, D. Sc.,
President

ARTHUR BURTON CORDLEY, M. S.,
Director.

CLAUDE ISAAC LEWIS, M. S. A.,
Vice-Director.
Horticulturist.

JAMES DRYDEN,
Poultry Husbandman.

HENRY DESBROUGH SCUDDER, B. S.,
Agronomist.

HERBERT SPENCER JACKSON, A. B.,
Botanist and Plant Pathologist.

THEODORE DAY BECKWITH, M. S.,
Bacteriologist.

ERMINE LAWRENCE POTTER, B. S.,
Animal Husbandman.

HERMAN VANCE TARTAR, B. S.,
Chemist.

HARLEY FROST WILSON, M. S.,
Entomologist.

ROY RALPH GRAVES, M. S.,
Dairy Husbandman.

VICTOR RAY GARDNER, M. S.,
Pomologist.

GEORGE ROBERT HYSLOP, B. Sc.,
Assistant Agronomist.

ARTHUR GEORGE BOUQUET, B. S.,
Olericulturist.

EDWARD JACOB KRAUS, B. S.,
Research Associate in Horticulture.

WILBUR LOUIS POWERS, M. S.,
Assistant Agronomist.

HOWARD PHILLIPS BARSS, A. B., M. S.,
Research Assistant in Chemistry.

MERRIS MICKEY McCOOL, Ph. D.,*
Assistant Agronomist.

BERT PILKINGTON, B. S.,
Research Assistant in Chemistry.

FRANK ROSS BROWN, B. S.,
Research Assistant in Horticulture.

FLOYD DOUGLAS BAILEY, M. S.,
Research Assistant in Plant Pathology.

FREDERICK CHARLES BRADFORD, M. S.,
Research Assistant in Horticulture.

LESTER LOVETT, B. S.,
Research Assistant in Entomology.

ALONZO F. VASS, M. S.,
Research Assistant in Bacteriology.

OTTO GERALD SIMPSON, B. S.,
Assistant Dairy Husbandman.

E. ROSS STOCKWELL, B. S.,
Assistant Dairy Husbandman.

REGINALD H. ROBINSON, A. B.,
Research Assistant in Chemistry.

ALDEN FORREST BARSS, M. S.,
Research Assistant in Entomology.

*Resigns, September 1, 1914.

RALPH FINNEY BEARD, B. S.,
Research Assistant in Chemistry.

GEORGE FRANKLIN MOZNETTE, B. S.,
Research Assistant in Entomology.

GEORGE ROY SAMSON, A. B., B. S.,
Assistant Animal Husbandman.

ORAN MILTON NELSON, B. S.,
Assistant Animal Husbandman.

ALLISON MORRIS WOODMAN, B. S.,
Orchard Foreman.

GEORGE HAROLD GODFREY, B. S.,
Research Assistant in Plant Pathology.

CHARLES EUGENE ROBINSON,
Foreman Stock Farm.

CHARLES STOCKTON BREWSTER, B. S.,
Foreman Poultry Plant.

UNION BRANCH EXPERIMENT STATION

ROBERT WITHYCOMBE, B. S.,
Superintendent.

UMATILLA BRANCH EXPERIMENT STATION

RALPH WILMER ALLEN, B. S.,
Superintendent.

**SHERMAN COUNTY DRY-FARM BRANCH EXPERIMENT
STATION**

DAVID E. STEPHENS, B. S.,
Superintendent.

SOUTHERN OREGON BRANCH EXPERIMENT STATION

F. C. REIMER, M. S.,
Superintendent.

M. P. HENDERSON, Ph. D.,
Pathologist.

HARNEY VALLEY BRANCH EXPERIMENT STATION

LEROY BREITHAUPT, B. S.,
Superintendent.

JOHN JACOB ASTOR BRANCH EXPERIMENT STATION

HARRY ARTHUR LINDGREN, B. S.,
Superintendent.

HOOD RIVER BRANCH EXPERIMENT STATION

JOHN ROBINSON WINSTON, M. S.,
Pathologist.

CLARENCE CECIL STARRING, B. S.,
Horticulturist.

OTHER OFFICERS

ELMER POLIC JACKSON, B. S.,
Superintendent of Buildings.

SIBYLLA HADWEN,
Housekeeper Women's Dormitories.

CHARLES LEWIS PARRISH,
Auditor.

KATHERINE HAIGHT,
Preceptress of Cauthorn Hall. -

HELEN LUCILE HOLGATE, B. S.,
Station Clerk.

NORMA WADDLE, B. S.,
Assistant in Seed Testing Laboratory.

DAVID MASTERTON,
Foreman Campus and Greenhouses.

F. H. CASE,
Foreman College Print Shop.

C. E. ROBINSON,
Animal Husbandry Foreman.

J. H. EDWARDS,
ELLSWORTH ERWIN,
Head Janitors.

STANDING COMMITTEES

(The President of the College is ex-officio a member of all standing committees.)

1. *Entrance Examinations*—Professors N. Tartar, McLouth, Mr. Baldwin.
2. *Scholarship and Graduation*—Professors Berchtold, Dubach, Weniger, Hillebrand, Mr. Tennant.
3. *Graduate Students and Advanced Degrees*—Professors Skelton, Weniger, Macpherson, Graves.
4. *Credentials, Advanced Standing, and Substitutions*—Professors Ressler, Gardner, Mr. Tennant.
5. *Schedules*—Professors Johnson, Beaty.
6. *Student Affairs*—Professors Peavy, Beckwith, Calvin, Reed, Thayer, Peterson, Kraus, Brodie.
7. *Student Domiciles*—Professors Horner, Simpson, Mrs. McElfresh, Miss Vance.
8. *Health and Sanitation*—Professors Beckwith, H. V. Tartar, Miss Hadwen.

Oregon Agricultural College

GENERAL INFORMATION

FOUNDATION AND ENDOWMENT

In pursuance of an Act of Congress, approved by President Lincoln, July 2, 1862, a grant of land to the amount of thirty thousand acres, or its equivalent, was made to each State in the Union for each Senator and Representative in Congress to which the State was entitled by the apportionment of the census of 1860. The proceeds under this Act were to constitute a perpetual fund. The principal of this fund was to remain forever undiminished; but the interest arising from the fund was to be inviolably applied by each State that should avail itself of the benefits of the Act, to the support and maintenance of a "College where the leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." Ninety thousand acres of land were apportioned to Oregon, and by an Act approved October 9, 1862, the Legislative Assembly of Oregon accepted the provisions of the Congressional law.

THE LAND-GRANT FUND. The subsequent sale of this land has netted the College approximately \$200,000. This at present is invested in securities bearing six per cent interest. The Act of Congress of 1862 explicitly demands that no part of the funds so appropriated, or the interest arising therefrom, shall be used for the purchase, erection, or maintenance of any building or buildings.

THE HATCH FUND. Under an Act of Congress, approved March 2, 1887, the College receives \$15,000 a year for the maintenance of an Agricultural Experiment Station, "to aid in acquiring and diffusing among the people useful and practical information on subjects connected with agriculture."

THE MORRILL FUND. On August 30, 1890, an Act was passed by Congress "to apply a portion of the proceeds of the public lands to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under the provisions of the Act of 1862." This Act provided that in 1890, \$15,000 should be paid to each of the land-grant colleges, and that the amount so appropriated should be increased by the sum of \$1,000 annually for ten years, and that thereafter the amount annually appropriated should continue to be \$25,000. Under an Act of Congress, approved March 4, 1907, known as the Nelson Amendment, this fund was increased by the sum of \$5,000 for the first fiscal year ending June 30, 1908, and by an additional \$5,000 for each succeeding year until the total annual amount in 1912 reached \$50,000.

THE ADAMS FUND. An Act of Congress, approved March 20, 1906, appropriated an initial \$5,000 for that year, and \$2,000 additional for each year thereafter until the annual amount should reach \$15,000. This fund is "to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry" of the State, and therefore supplements the Hatch Fund in the maintenance of the Experiment Station.

The College, therefore, receives annually from the National Government the following income: (a) interest on the land-grant sales fund, \$12,000; (b) the Hatch fund, \$15,000; (c) the Morrill fund, \$50,000; (d) the Adams fund, \$15,000.

In addition to this income derived from the National Government, the College is dependent upon the State Legislature for such appropriations as are required for the maintenance and development of the institution, in accordance with the provisions of the Acts of Congress, and in response to the industrial and educational demands of the State.

HISTORY

As there were no State colleges in Oregon in 1868, the Legislature of that year, which provided for the location of the land received under the Act of 1862, gave the interest on the funds derived from the sale of the land to the Corvallis College, a private institution in Benton County, which was then under the control of

the Methodist Episcopal Church, South. For a number of years, none of the land granted was sold, and the Legislature made small annual appropriations for the support of the school.

In 1885, the church voluntarily relinquished its claim on the funds of the College and the State assumed entire control of the institution. The Legislature of that year provided for the "permanent location of the State Agricultural College at Corvallis, in Benton County," on condition that the citizens of said county should within four years, erect on the "farm containing thirty-five acres in the immediate vicinity of said city, known as the Agricultural College Farm, brick buildings for the accommodation of said State Agricultural College at a cost of not less than \$20,000." During the summer of 1887, the corner stone of the building erected by the citizens of Benton County was laid by the Governor of Oregon amid imposing ceremonies.

This structure, now known as the Administration building, was the nucleus around which other buildings soon began to cluster as necessity and growing interest demanded. For a year or two there was ample room; but, as the institution grew, more land was needed and provided, and the institution now owns, instead of the thirty-five acres originally comprising campus and grounds, three hundred and sixty acres; and instead of one structure, thirty-five. There has also been a marked increase in the attendance, from ninety-seven to two thousand five hundred students. Twenty years ago, most of the students came from Benton and neighboring counties. Today, every county in Oregon, thirty-five other states, and eight foreign countries are represented. The increase in the number of students called for an increase in the number of the faculty. This body, from the number of five in 1884, has grown until it now closely approaches two hundred. Other features usually found in connection with progressive educational institutions have grown in equal ratio. The courses have been strengthened, the standard has been advanced, and other improvements have been made from time to time, which have added to the thoroughness and efficiency of the work.

GOVERNMENT

The general government of the College is vested primarily in the Board of Regents, and, under their control, in four other

administrative bodies—the Administrative Council, the College Council, the Faculty, and the Experiment Station Staff. These bodies, in the exercise of their respective duties, determine the questions of policy and regulate all matters relating to the interests of the institution.

THE BOARD OF REGENTS consists of thirteen members, of whom the Governor, the Secretary of State, the Superintendent of Public Instruction, and the Master of the State Grange, are ex-officio members. The nine other members are appointed by the Governor with the approval of the State Senate, and hold office for a term of nine years. Under a law of the State Legislature, passed in 1885, the Board of Regents constitutes a body corporate, under the name of "The Board of Regents of the State Agricultural College, * * * with power to sue and be sued, and to make contracts," and to enact such regulations as may be necessary for the maintenance and development of the College.

THE ADMINISTRATIVE COUNCIL consists of the President of the College, the Director of the Experiment Station, the Deans of the different Schools, the Director of the Summer School, the Dean of Women, and the Director of Extension. The function of this Council is to consider and determine the larger questions of policy and administration.

THE COLLEGE COUNCIL is composed of the President of the College and all officers of administration and instruction with the rank of professor, associate professor, or assistant professor. This body considers all general questions relating to the educational work and policy of the College; arranges and correlates the courses of study, and determines the requirements for admission and graduation. The different committees of the College Council, representing the several schools of instruction, have charge of the enrollment and progress of students in the respective schools, and investigate the records of all candidates for graduation.

THE COLLEGE FACULTY comprises members of the College Council and all other instructors and members of the Experiment Station Staff. It considers routine questions of method and discipline, a function for which it is particularly well adapted, being in close contact with all that pertains to student interests and student life.

THE EXPERIMENT STATION STAFF includes the President of the College, the Director of the Experiment Station, the heads of the

various departments of the School of Agriculture, and all assistants, engaged in research and experimental work. The members of this staff are engaged in the investigation of problems encountered in the development of the agricultural interests of the State. They also distribute information regarding their investigations by means of correspondence, circulars, and station bulletins.

THE STUDENTS. The College does not undertake to prescribe in detail either its requirements or prohibitions. Students are met on a plane of mutual regard and helpfulness. Since the advantages of the institution are provided at public expense, the students are under special obligation to perform faithfully all their duties, not only to the College, but also to the community and to the State. Whenever the deportment of any student is such that his influence is inimical to the interests of the institution, he will be relieved from further attendance.

PURPOSE AND SCOPE

The purpose of the College is to provide, in accordance with the Acts of Congress under which it is maintained, a liberal, thorough, and practical education—an education that will afford the training required for efficient service in different branches of industry. The distinctive technical work covers the three great fields of production, manufacture, and commerce. Special attention is given to the application of science. All the practical work in the laboratories, in the shops, in the orchards, and on the farm, is based on scientific principles. While the industrial or technical work is emphasized, the importance of a thorough general training, of mind development, and of culture, is recognized in all of the work throughout the institution. The object is to meet the demand for a broad and general education, supplemented by special technical training.

The work, therefore, covers a broad field, including technical courses along the different lines of agriculture, home economics, engineering, commerce, forestry, pharmacy, industrial pedagogy, and industrial arts; with the necessary training in the basic subjects of mathematics and the natural and physical sciences; and also the general training in language, literature, history, civics, and physical education, which constitutes an essential part of a liberal education.

In all the work of the institution, the object is to train the mind, the eye, and the hand to act in unison; to unfold and co-ordinate the faculties of mind and body; to develop a symmetrical manhood and womanhood, and a just appreciation of clean, upright citizenship.

LOCATION

The seat of the Oregon Agricultural College is Corvallis, a city of over five thousand inhabitants, situated at the head of navigation on the Willamette River. As the name implies, it is in the heart of the far-famed Willamette Valley. It is readily accessible by steam and electric railway from all parts of the State; it has free mail delivery; there are many churches and no saloons, and the moral tone is equal to that of any city within the boundaries of the State. It is a city of homes, and its people are justly proud of the great institution in the midst of them, and jealously guard its good name.

Situated on high, well-drained land, open to the invigorating sea-breeze, Corvallis is one of the most healthful cities in the State. It has never been visited by any dangerous epidemic disease, and the possibilities of such visitation in the future appear remote, for the city has a complete modern sewerage system and first-class gravity water system, supplied from springs high up the slope of Mary's Peak, the tallest mountain in the Coast Range, some fifteen miles away to the west. The city and its environs are conducive to wholesome student and home life. It has an ample supply of pure mountain water for all domestic and sanitary purposes. The atmosphere is purified and the climate ameliorated by almost constant ocean breezes—warm in winter and cool in summer. The surrounding landscape elicits praise from all who behold its delightful charms as viewed in the extensive area of fertile fields, gardens, and orchards. The wooded glens of the near-by foothills, and the lively mountain brooks, or the more pretentious streams frequented by canoe, yacht, and launch parties, are fruitful sources of recreation; while the magnificent distant views to the east, where the fir-clad Cascade Mountains, with their wealth of trees and the perennially snow-capped sentinels—Hood, Jefferson, and

the Three Sisters—present a constant panorama of picturesque mountain scenery. With such an environment, the city is truly an ideal location for a college and a home.

GROUND AND BUILDINGS

THE COLLEGE GROUNDS comprise three hundred forty-nine acres. That part of the grounds, ninety-one acres in extent, lying immediately about the several buildings, east of Cauthorn Avenue, and usually designated as the lawns and campus, is tastefully planted with both native and exotic ornamental trees, shrubs and herbs. The one hundred and forty-three acres used for the farm, garden, and orchard operations is so platted and planted as to meet the demands of the various lines of work and still conform to a general scheme of landscape embellishment. This portion occupies a slightly elevated and gently undulating site wholly within the western limits of the city of Corvallis. In addition to the above plot, one hundred and fifteen acres, comprising the College stock farm, lies just south of the city limits. Broad drives and walks traverse the campus in all directions, thus rendering every objective point easily accessible. The numerous magnificent specimen trees, groups of shrubbery, and massed borders are a source of enjoyment as well as of instruction to all those who frequent the grounds. The scheme of planting has been such as to give an air of peaceful activity, orderly effort, earnest purpose, and quiet refinement. Daily association with such scenes for a period of years, during the time when men and women are forming the habits of thought and action that will be theirs through life, is certain to have a deep-seated and subtle influence for good in moulding the character of future citizens.

The following brief descriptions will convey a general idea as to the principal buildings and the purposes for which they are used:

THE ADMINISTRATION BUILDING is a three-story brick structure, 90x120 feet, containing nine recitation rooms, the library, the offices of the President, the Registrar, and the Business Manager. Centrally located and on a slight eminence, it commands an unsurpassed view of the campus, the city of Corvallis, the course of the Willamette River, and the picturesque Cascades.

SCIENCE HALL, situated southeast of the Administration building, and constructed of gray granite and sandstone, covers a ground space of 85x125 feet, has three stories and basement, and contains fifty-five rooms. It is one of the most serviceable buildings on the ground, and within it, at present, are the School of Forestry, and the departments of Pharmacy and Chemistry, with their various laboratories, recitation rooms, and lecture halls, together with the offices and laboratories of the Experiment Station chemists.

AGRICULTURAL HALL, standing southwest of the Administration Building, is the largest structure on the campus. It is an imposing edifice of brick and sandstone, consisting of the central or Administrative building, the north or Agronomy wing, and the south or Horticultural wing.

The central or Administrative building is 66x140 feet, four stories and basement, and contains a total of forty-two conveniently arranged and well-lighted class rooms, laboratories, and offices. Upon the first floor are the offices of the Director of the Experiment Station and Dean of the School of Agriculture, the Professor of Poultry Husbandry, the Director of Extension Work, the Station mailing rooms, and the Agricultural library. The second floor is occupied by the department of Industrial Pedagogy, and the department of Animal Husbandry; the third floor, by the departments of Zoology and Entomology; and the fourth floor, by the departments of Bacteriology and Art, together with the general museums.

The north or Agronomy wing is 72x130 feet, three stories high. It faces north and east, commanding splendid views of the valley and the College grounds. It is thoroughly modern in all its equipment, and while intended solely for the work in Agronomy, at present accommodates, temporarily, two departments. The first and second floors occupied by the department of Agronomy, contain seventeen rooms, variously devoted to laboratory and class purposes in Agrostology, Soil Physics, and kindred subjects. The third floor, with eight rooms, is used by the School of Commerce.

The south or Horticultural wing is 72x130 feet, three stories high. In the basement are located laboratories for plant propagation, spraying, vegetable preparation, and fruit packing. The basement also contains the general storage rooms for the department, and rooms which are especially adapted for the storage of fruits. The first floor contains the offices of the department of

Horticulture, the research laboratory, systematic pomology laboratory, and three large lecture rooms. The second floor contains the offices of the department of Botany and Plant Pathology, three recitation rooms, and three student laboratories. The third floor contains the horticultural museum and horticultural herbarium, photograph room, large student lecture room, draughting rooms, lecture rooms, and office of the Landscape Gardening section. These rooms are all especially well lighted and contain every convenience for conducting the work with efficiency.

GREENHOUSES. A new range of greenhouses, modern in every respect, has recently been constructed with a view to aiding the student in his studies in commercial greenhouse work. The range is made up of five even-span houses, three ninety feet long by twenty feet wide, and two thirty-three feet long by twenty feet wide, making the total area under glass 6,720 square feet. A modern hot-water heating apparatus has been installed, with valves and pipes so arranged that different temperatures can be maintained in every separate thirty feet of house in the three long houses. Each of the large houses has been divided into sections thirty feet long, so that the entire space in each may be given up to a single crop. Of the two smaller houses, one is given up to research work, and one to the propagation of plants in general. The central building is large and conveniently arranged for all work that is to be met with in greenhouse establishments. Such crops as carnations, chrysanthemums, violets, palms, ferns, general pot plants, and forced vegetables, like tomatoes, lettuce, and cucumbers, are grown in these houses.

DAIRY BUILDING. About sixty feet to the northward of the Agricultural building is located the Dairy building. The general scheme of both outside and inside finish is similar to that of the Agricultural building. The structure is 54x141 feet, three stories high. On the first floor are located the offices of the Dairy department and commodious laboratories for butter-making, cheese-making, and market milk instruction, including a well-equipped boiler and engine room and student lockers. On the second floor are the testing laboratory, advanced laboratory, farm dairy and shop rooms, veterinary laboratories, etc. The third floor is temporarily

occupied by the department of mathematics, with the exception of a general lecture room, extending across the south end of this floor, and having a seating capacity of two hundred.

HOME ECONOMICS. The first wing of the new Home Economics building is occupied by the departments of Domestic Science and Domestic Art. This building is located directly west from the Dairy building. It consists of three stories above a high basement, and is finely built of brick and stone. The most modern type of heating and ventilating systems are installed, and all provisions are made for the comfort and convenience of the young women carrying the work in Home Economics. The Dean's office is on the first floor near the south entrance of the building. Excellent offices for the Professor of Domestic Art and the assistants in both Domestic Science and Domestic Art, are on the second and third floors.

The food laboratories are on the first and second floors, while the Domestic Art department has all of the third floor of the building and part of the second floor. An abundance of locker and dressing rooms are arranged for the convenience of the students, and hot and cold water is supplied in all parts of the building. The housing and equipment of the School of Home Economics, in short, are thoroughly modern and adequate.

THE MINES BUILDING, which is 65x81 feet, is located about 100 yards northwest of the Administration building, and is one of the newest buildings on the campus. This building forms the northern boundary of the quadrangle which is planned in the new building scheme on the College campus. It is a fine four-story structure, constructed of brick, trimmed with stone, and similar in type to Agricultural Hall. The first floor of the building contains the main offices, assaying, metallurgical and ore dressing laboratories. The basement contains the crushing and sampling rooms, the ceramic laboratory, and the stock rooms. On the second floor will be found the Bureau of Mines laboratory and lecture and class rooms. On the third floor is the geological museum, the mineralogical and petrological laboratories, and draughting room. All the laboratories are provided with water, gas, electric lights, and steam heat.

MECHANICAL HALL, about one hundred and fifty yards northeast of the Administration building, is 90x120 feet, two stories

high, and constructed of Oregon gray granite and sandstone. It is a fine, substantial building, well arranged and admirably adapted to the purpose for which it is used. Besides recitation and lecture rooms for the classes in Mechanical, Electrical, and Civil Engineering, it contains the Physical and Engineering Laboratories.

MECHANICAL ARTS BUILDING is a modern, well-lighted structure of brick, with cement foundations, 52x52 feet, two stories high, flanked by a one-story wing on the east, 40x220 feet, and a similar wing on the south, 40x200 feet. The central portion contains the office of the Dean, a display room for student work, a tool room for the machine shop, and a finishing room for the wood shop. On the second floor is a general draughting room, 30x50 feet, with a commodious blue-print room and a dark room adjoining. The south wing contains the main woodworking shop, 40x97 feet, a stock room, 30x40 feet, a carpenter shop, 20x40 feet, and the College printing plant, 40x50 feet. The east wing contains the machine shop, 40x80 feet, the blacksmith shop, 40x100 feet, store room for coal and iron, lockers, and toilet rooms.

THE FOUNDRY, which is located immediately south of the blacksmith shop, is built of brick. It contains one 35-inch Collian cupola for melting iron, one brass furnace, one portable core oven, one stationary core oven for larger work, one twelve-hundred-pound crane ladle, one eight-hundred-pound mining ladle, and several smaller ladles. One crucible brass furnace, one two-ton jib crane, one post crane, one No. 2 Delano pulley molding machine, one tumbling barrel for cleaning castings, and a liberal supply of smaller tools, flasks, etc.

THE WOMEN'S GYMNASIUM is situated about two hundred yards south of the Administration building, and is erected against a gently sloping bank on Jefferson street. The structure, 70x120 feet, is built of stone and wood, and comprises a high, airy basement, or first floor, facing east, with the main floor above it, having a bank entrance on the west end. The first floor of the building is devoted to locker rooms, dressing rooms, bathrooms, and offices, together with a rest room and a special room for corrective gymnastics. The second floor consists chiefly of one large gymnasium room, which is also frequently used as a lecture hall, assembly room, and social center for moderate-sized gatherings. This room, which comprises 8,000 feet of floor space, is surmounted

by a balcony running track, suspended from the trusses. It affords facilities, in a court of 79x54 feet dimensions, for basketball, indoor baseball, and various winter and indoor games. The building affords ample accommodations for the physical training of all the women of the institution.

THE MEN'S GYMNASIUM is situated immediately west of Waldo Hall on Jefferson street, adjoining the main athletic field. The structure is to consist of four units, the central part being 90x150 feet, with each wing 52x96 feet in dimensions. The fourth unit will provide a swimming pool 50x100 feet, of modern design and finish. Only two units are to be completed during 1914, the main hall and the east wing. The main hall may be used as a lecture and assembly room, or a place for entertainments when large audiences are to be accommodated. The showers and the baths are of modern design, providing hot and cold water throughout the year. The floor of the main hall with its 13,500 square feet of surface, is surmounted by a balcony running track, and provides space for three basketball courts, indoor baseball diamond, and space for various winter and indoor games. The east wing will provide boxing and wrestling rooms, and an auxiliary gymnasium equipped with special apparatus for use of the individual and for corrective gymnastics. When completed, the building will have accommodations for upwards of 2,000 men.

THE ARMORY is situated about three hundred yards south of the Administration building. It is one of the largest of its kind in the United States and is built of concrete and steel, 126x355 feet. The drill hall portion has an unobstructed area of 36,000 square feet. The arms room, offices, and drill hall afford facilities for the accommodation of 1,000 men.

THE POWER PLANT, a one-story brick building in the rear of Mechanical Hall, contains the requisite equipment for supplying the various buildings with heat, light, and power. The apparatus installed in this building serves the purpose also of demonstration equipment in these special lines.

THE NEW HEATING PLANT, located at the south end of the Armory, is a one-story reinforced concrete building, with a concrete tunnel and conduits leading to the various buildings on the south side of the campus. It contains three boilers, one two-hundred-ninety,

one two-hundred-fifty, and one one-hundred-fifty-five horse-power, with the necessary equipment for heating the buildings connected with it.

WALDO HALL, the women's dormitory, occupies a commanding site one hundred and fifty yards west of the Armory. It is a large building of striking appearance, with a cement foundation and basement wall, and a cream-colored, pressed-brick superstructure, three stories high. The dimensions are 96x240 feet; and it contains one hundred and twenty-five rooms for students, besides a kitchen, dining room, and parlors. It is modern in all its appointments and finished throughout in natural grain Douglas fir, stained to conform to the color scheme.

CAUTHORN HALL, the second women's dormitory, is a well-proportioned frame building, situated on a commanding spot in the western part of the campus. It is 160x50 feet, has three stories and basement, and contains sixty-two rooms, besides a large kitchen, dining room, and reception rooms. Its furnishings and appointments are adequate, modern, and in harmony with its use. Each floor is supplied with hot and cold water, baths, electric light, and steam heat.

SHEPARD HALL, the student building under the auspices of the Y. M. and Y. W. C. A., was completed at a cost of something over \$22,000. The original plans were somewhat modified, giving in many respects a better building than planned at first. This building contains in the basement a swimming pool, shower baths, lockers, banquet room, kitchen, wood room, and accessories. The first floor contains a large lobby which is used for a reading room, game room for social events, and general assembly. It also contains offices for the General Secretaries, a public office, a cabinet and check room combined, and a room for the Y. W. C. A. The second floor contains six rooms for the use of the literary societies, the Athletic Association, and the staffs of the different College papers. The third floor is devoted for the present to dormitory purposes. The building, known as Shepard Hall, is a fitting tribute to the memory of Clay Shepard, who gave his life to the cause of cleaner, higher, and truer citizenship as exemplified in student life.

FARM BUILDINGS. The College Farm is now well equipped with farm buildings, and modern facilities for conducting practical and scientific work in animal husbandry.

THE NEW BARN is commodious, modern, and attractive in design. It is a frame building, with cement foundation and brick pilasters. The main part is 50x100 feet, two stories high, with two wings extending to the south, each 46x80 feet, one story in height. There is also a milk room, an engine room, and a fuel room. The building is utilized as a general barn, and will accommodate nine horses and seventy cattle, with sufficient space for the storage of feed. On the first floor of the main portion are located the horse stalls, bins for storing the various grains and mill feeds, a seed room, and space for vehicles. The concrete basement is of sufficient dimensions to permit the storing of about one hundred tons of roots. The second floor has a storage capacity for one hundred tons of loose hay. A prominent feature of the barn is the cow stable. This is strictly modern, well lighted and ventilated, with concrete floor, thirty individual, tubular-iron adjustable stalls, and two commodious box stalls. The aisles are wide, and thus not only furnish an abundance of air space for the animals, but also afford visitors an excellent opportunity to view the stock. The milk and engine rooms are conveniently situated, but sufficiently isolated for proper sanitation. This building is lighted by electricity, well supplied with water, thoroughly sewerred, and furnished with an elaborate system of bell traps.

The old barns were moved and remodeled so as to harmonize with the new structure. They contain rooms for housing machinery, and a commodious piggery.

THE NEW CATTLE BARN. The department of Animal Husbandry is fortunate in having been able to erect in the past year a splendid new beef-cattle and sheep barn. This barn is located just west of the old barns and has a floor space of 52x120 feet for sheltering stock. The hay loft has a storage capacity for 300 tons of hay and straw. Adjoining the barn are several concrete floored exercise lots. Especial conveniences are provided for the feeding, watering, weighing, and handling of live stock. The west half of the barn is at present devoted to beef cattle and the east half to sheep, although it is planned that the entire barn be eventually used for beef cattle.

THE STOCK JUDGING PAVILION. The Animal Husbandry work of the College has been aided by the erection of a new judging pavilion. This pavilion provides very comfortable and commodious

quarters for all of the live stock work. The main room is 40x90 feet, well lighted and provided with heat. A movable partition is provided whereby this large room may be divided into two smaller ones, each large enough for all ordinary purposes. The live stock work in the past has been very much handicapped by crowded quarters without heat or good light, but these difficulties are now past and the department is in a position to do much better work than before.

FARM MECHANICS BUILDING. A modern building has recently been completed for the Farm Mechanics work. It is an attractive, well-lighted brick building, having a large operating floor, a class room, locker room, shop, and tool room on the first floor. This operating floor is of cement and is roomy enough for demonstration and for the operation of the heavier farm machines. Within this place is reserved space for the very heavy farm tractors. A gallery surrounds this operating floor and provides space for the lighter farm implements such as tillage, haying, and harvesting machines.

The building is equipped with shafting, belting, and power for the operating and testing of the various machines, and a large well is provided for making pump tests. A very complete equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest; so that the student has constantly before him and is working with and studying the very best classes of farm machinery of all types.

Representative machines are found in the laboratory as follows: plows, harrows, pulverizers, cultivators, plant setting machines, corn planters, potato planters, grain and grass seeders, mowers, rakes, binders, sprayers, manure spreaders, potato diggers, wagons, etc. Among the power machines are stationary gasoline engines, various types of pumps and pressure water systems, feed grinders, gasoline tractors, steam tractors, gang plows, and complete threshing machines. All of this expensive equipment is available to students in Farm Mechanics in the regular and short course work.

THE POULTRY HOUSES. On a ten-acre tract of land, lying south and west of Cauthorn Hall, there have been erected several buildings especially planned for the needs of the department of Poultry Husbandry. The main poultry building is a three-story structure and is used principally for class, laboratory, and demonstration pur-

poses. It contains a demonstrating room with desks and other necessary equipment; a shop, with the necessary tools, benches, and equipment for practice work in building poultry plant equipment; storage rooms, office, and wash rooms are also provided. In the basement, rooms are provided for fattening and killing fowls, an incubator room for student use, and a feed room with the necessary machinery for grinding and mixing poultry feeds. Besides the main poultry building there is an incubator house, with a capacity of twenty-four incubators and complementary apparatus; and a feed-storage building and a brooding house. There are also colony houses for laying and breeding stock and growing chicks. The colony houses are movable and constructed upon a plan that could be adopted by any farmer. The colony brooding coops are also portable, and are used for investigations in both natural and artificial brooding.

EQUIPMENT

It is impossible, in the brief space that is devoted to this topic, to give more than a bird's-eye view of the equipment of the institution. The following data have been so arranged, however, as to give the prospective student a very good general idea of the comprehensive equipment that the institution possesses for carrying forward its designated work.

AGRONOMY. The Agronomy wing of the Agricultural building, the Farm Mechanics building, and the Agronomy Greenhouse, provide large, well-lighted offices, class rooms, laboratories, storerooms, and other facilities for the work in Agronomy.

A large Soil laboratory is equipped with the necessary apparatus for the complete study of the physical properties of soils and problems of soil management. Ample desk room supplied with running water, gas, compressed air, and electricity, is available for sections of fifty students each. Electric centrifuges and shakers, electric bridge for alkali testing, electric air baths, analytic and torsion balances, microscopes, blast lamps, aspirators, percolators, capillary tubes, mulch cylinders, soil sieves, scales, solution balance, compression filters, soil sampling tubes, etc., form part of the equipment for the work in Soil Physics. Soil surveying and mapping

outfits, soil survey charts of the United States, and a collection of samples of the chief soil types of Oregon and the United States, are available.

A new Soil Preparation room equipped with benches, soil grinding and sifting machinery, large soil bins, and ample space for the drying, preparation, and storage of large quantities of the different soil types used in the laboratories, is available.

For the work in Field Crops, a large new laboratory on the second floor of the Agronomy building has been equipped with special compartment desks for advanced work sufficient to accommodate sections of thirty students each, and additional benches sufficient to allow for laboratory classes of one hundred or more during the Winter Short Course period. This laboratory is furnished with an excellent equipment for all the courses in Crops, consisting in part of grain sampling and mixing machines, compound and binocular microscopes, dissecting microscopes, field lenses, germinating chambers and various types of plain and farm germinators, grain testers, grain grading apparatus, moisture testing apparatus, grain receptacles and storage cases of many kinds, and complete sets of seed, crop plant, and weed specimens. Each student is provided with samples of both the seed and the plants of different varieties of all the important field crops, and weeds of Oregon and the United States.

The Seed Testing Laboratory, maintained jointly by the United States Department of Agriculture and the College, is in operation throughout the year. It is fully equipped for this work and is available for instruction of students specializing in Seed Testing.

A new Agronomy Exhibit Room and Museum has been provided and is being equipped for the coming year with exhibit cases and racks for the collections of grains, crop plants, weeds, soil samples, and other exhibits of interest and use in the different courses in Agronomy.

The work in Farm Mechanics is provided for in a separate building fitted with shafting and power and fully equipped with all classes and types of tillage implements; seeding, harvesting, pumping, and power machinery; farm engines and tractors of all kinds; self-registering dynamometer and other testing apparatus; shop; well; tools; forms for concrete construction; etc.

A laboratory for the work in draughting required in the various courses in Agronomy, such as Farm Drainage, Irrigation Farming, Farm Management, etc., is equipped with drawing tables, cabinets, blue-printing frames, etc.

For the work in Irrigation and Drainage, surveying instruments, tile and ditching tools, weirs, flume, hook gauges, water stage register, electric pumping plant, etc., are available. Weather recording instruments of different kinds supply equipment for the course in Climatology.

The Agronomy class rooms have demonstration desks, lantern facilities, illustrative charts of various kinds, and a well-stocked reference library.

For field work, the experimental plots and fields on the Experiment Station farms and cooperative experiments at Corvallis and in other parts of the state offer an exceptional opportunity for study and comparisons in such work as plant breeding as applied to the different kinds of field crops; soil fertility rotations; use of commercial fertilizers; use of irrigation waters; effects of tile drainage on different types of soils; growing of different soiling crop sequences; production of high grade seed on a commercial scale; harvesting, manufacturing, and storage of crops; management of the fields and crops as to tillage operations, seeding, etc. With both the Experiment Station and the College farm operations under his eyes, the student may observe the experimental trial of a method of crop or soil management in the experimental plots and then the practical application of the successful method in the commercial production carried on in the fields of the College farms. The yearly results obtained in the Agronomic investigations at the branch Experiment Station farms at Moro, Burns, and other parts of the state, furnish the latest data and object lessons with reference to the dry farming and irrigation farming methods in other parts of the state.

ANIMAL HUSBANDRY. The equipment of the department of Animal Husbandry consists essentially of live stock, barns, and the College stock farms. During the past year the live stock available for illustration and demonstration purposes has been very much improved in numbers and in quality. The College flocks and herds now include typical specimens of Shorthorn and Hereford

cattle, Cotswold and Shropshire sheep, Berkshire, Yorkshire, Poland China, and Duroc Jersey swine, Percheron, Belgian, Clydesdale, Shire and Standard bred horses, together with the live stock used in experimental work. In addition to the live stock regularly kept on the College farm, much good stock is loaned from time to time by the leading breeders of the State. During the winter carload lots illustrating the market classes are brought in for demonstration purposes. The department also possesses the necessary maps, charts, lantern slides, stud books, library, and other equipment for conducting laboratory, lecture, and recitation work in the several phases of Animal Husbandry. There is now in the department a complete animal husbandry library.

DAIRY HUSBANDRY. The Dairy building, with its three floors and its newly remodeled manufacturing facilities, affords convenient and modern resources for the work of this department. In the manufacturing work, it is the intention to give the student theory and practice in the manufacture of dairy products. Commodious quarters are provided for this department in the Dairy building. The equipment is such as to permit handling milk and cream on a commercial scale, thus giving the student practice under actual factory conditions. On the first floor, are the offices and manufacturing rooms, the latter including a boiler room equipped with a 15 H. P. internal furnace boiler and a 10 H. P. Jewel automatic steam engine; a farm butter making room, in which are found hand churns, butter workers, and the various types of separators found on the market; a churn room, which is equipped with modern ripeners, combined churns, various forms of butter molding appliances, refrigerating machine, cooling room, and ice cream freezer; a market milk room, with milk cooler, bottle filling machine, and bottle washer; a cheese room, which is equipped with cheese vats, automatic pressure cheese press, and other equipment used in the cheese factory; a cheese curing room; and a reading room.

On the second floor, are located recitation rooms, and advanced and general laboratories. The latter will accommodate two hundred students in sections of forty each, and are equipped with a full line of appliances for testing milk and milk products. In the advanced laboratory, will be found moisture tests, salt tests, curd tests, and various other forms of apparatus suited to the needs of the ad-

vanced student. A circulating hot water system connects the wash sinks in all of the laboratories. Both steam and electricity are used for power purposes.

The College dairy herd consists of thirty-five head of high-producing dairy cattle of the Jersey, Holstein-Friesian, Guernsey, and Ayrshire breeds. These cattle are housed in a modern dairy barn.

HORTICULTURE. The Horticultural wing of the Agricultural building contains many spacious rooms, and thoroughly modern equipment for teaching the various subjects. In the basement will be found a large spray laboratory furnished with gas and water and all the equipment, chemicals, and apparatus which are necessary to teach students the proper mixing and testing of the different sprays; accommodations are offered also for the testing of nozzles and spraying apparatus. The department has a large number of hand and power spraying outfits that are placed at the disposal of students.

A large, well-lighted plant propagation laboratory offers unexcelled opportunities for the study of plant propagation. Specially equipped cabinets, tables, and incubator have been constructed; so that the students can handle to advantage such topics as seedage, layerage, making of cuttings, and budding and grafting.

A laboratory has been especially fitted for the use of students in gardening. It contains large cement-set tubs, where students are taught the proper methods of preparing vegetables for market. This room also contains a demonstration earth bed for use during the winter, to show how the various tools for planting seed and for cultivation are used. The demonstration bed also allows the instructor to demonstrate the proper method of interplanting and transplanting of plants.

In the basement is also located a very large fruit packing laboratory equipped with fruit presses, packing and grading tables. The large storage rooms are also located in the basement and include a suite of rooms which are chilled by mechanical refrigeration.

On the first floor a systematic pomology laboratory is especially equipped for the study of nuts, fruits, etc. A special research laboratory, found on this floor, is used for the research assistants in the department, and is also at the disposal of advanced students. This room is completely equipped with ovens, microscopes, and similar apparatus necessary for extensive research work.

On the top floor is the horticultural museum, which is found to be of great value, as in this room are stored all sorts of equipment used in Horticulture, such as pruning shears, budding and grafting utensils, prune drying apparatus, fruit graders, etc. The department also has on this floor a herbarium which is especially supplied with the plants used in Horticulture. On this floor is also found a large draughting room, extending along the entire south end of the building, supplied with tables, cabinets, etc., for the use of students studying Floriculture, Landscape Gardening, and Greenhouse Construction, Orchard Planting, and Packing House Construction. In addition to these rooms, the department has four large lecture rooms. A balopticon with a good collection of lantern slides, and a large library, add materially to the equipment.

The department is also especially provided with tools and apparatus necessary for conducting field exercises in Truck Gardening, Floriculture, Landscape Gardening, and Pomology.

POULTRY HUSBANDRY. The equipment of this department consists of a number of poultry houses of different types; about 1,000 fowls of several breeds and varieties; twenty incubators of several different makes; brooders of different types; hatching, brooding, and colony coops; bone and clover cutters; feed grinders and mixers; cramming machine and fattening batteries; trap-nests; and various other appliances necessary for practical poultry keeping. There are also sets of charts, lantern slides, motion pictures, and photographs, illustrating breeds of fowls, poultry farms, and houses.

BACTERIOLOGY. This department occupies new and commodious quarters on the fourth floor of the Agricultural building. It has much more room at its disposal than heretofore, occupying at present three large laboratories, besides an incubator room, a smaller room for a library, and a large storeroom. The laboratories for general and advanced Bacteriology are completely equipped for work in this science. Apartment, lead-topped desks, individual wall lockers, cylindrical and square copper sterilizers, supplied with steam from the main heating plant, small and large hot-air sterilizers, a small and a large steam pressure horizontal sterilizer, the latter measuring 14x22 inches inside chamber, and arranged for "dry steam" sterilization, are conveniently arranged in the general

laboratory for the larger sections. Small incubators are used by the advanced students, while a large incubator room, steam heated, is within easy access to both general and advanced laboratories. For special work demanding an extraordinary degree of exactness, there is a large electrically controlled and heated incubator. Lead-topped tables with convenient drawers furnish ample working space. Hot and cold water is supplied to all laboratories and is fed by the main water system and by a 40-gallon hot water tank. Sinks are uniformly lead. Each desk and locker is equipped with a complete outfit of microscopes and accessories for high power centrifuge. There is a complete collection of common and precision glassware; and all the other necessary minor equipment for work in bacteriology is at the disposal of elementary and advanced students. There is a completely equipped dark room fully fitted up for work in photomicrography. In connection with this room there is an arc lamp for illumination purposes for this work.

BOTANY AND PLANT PATHOLOGY. This department occupies the entire second floor of the Horticultural wing of the Agricultural building. Besides three general student laboratories, a special laboratory for plant physiological work and an herbarium room, which is also used as an instructor's preparation room, are provided. This latter room is equipped with desks for special and graduate students. A large, well-lighted laboratory is provided for the experimental work in plant pathology. A small room for the department library and records is used also as an office for the instructors. A special physiological dark room for experimental work in plant physiology is provided. The student laboratories are equipped with large student tables, each of which will accommodate four students. Compound and dissecting microscopes are provided for each student. The physiological laboratory is equipped with the essential apparatus for modern laboratory courses. The research laboratory in Plant Pathology has the most modern equipment available.

The phanerogamic herbarium of several thousand mounted and many thousand unmounted plants is particularly rich in Oregon forms, while containing quite extensive collections of the New Mexico, California, Michigan, and Washington floras. The herbarium is being rapidly enlarged by purchase and exchange; particular attention is being given to the accumulation of economic ma-

terial including the forest and shade trees of North America, agricultural plants of the world, pharmaceutical plants, and weeds and grasses of economic importance. Large and miscellaneous collections of the various groups of cryptogamic plants are being assembled. Particular attention is being given to the collection of parasitic fungi, for use in the work in Plant Pathology. A private collection of about five thousand specimens of fungi particularly rich in parasitic forms has been temporarily loaned by H. S. Jackson for the use of students and instructors.

A large amount of class study material is preserved in alcohol for the use of students. A well-selected collection of microscopic slides, photographs, lantern slides, and charts is provided and is being rapidly enlarged.

ZOOLOGY. The laboratories of this department occupy the following rooms on the third floor of Agricultural Hall: offices, physiological laboratory, laboratory for embryology and histology, general laboratory for zoology, lecture room, vault and photographic dark room. The general laboratory is equipped with desks with individual drawers to accommodate 280 students; each desk is provided with compound microscopes, dissecting microscopes, and various minor pieces of apparatus. The physiological laboratory is similarly equipped for 225 students and in addition is provided with an articulated skeleton, a dissectible human skull, a complete Azoux model of the human body, greatly enlarged Azoux models of the brain, eye, ear, and other organs, a set of the celebrated Leukart zoological charts, and a good supply of specimens and dissections for illustrating the work in physiology. The laboratories are provided with high grade compound and dissecting microscopes, a Minot rotating microtome, a Minot automatic precision microtome, water bath, 5x7 view camera, laboratory balances, eye-piece, and stage micrometers, and an abundant supply of minor instruments.

The museum contains, in addition to a beautiful collection of native birds, a small collection of mounted mammals, the Ladd collection of bird skins, a large collection of eggs of native birds, a small collection of fishes and reptiles, a considerable number of marine invertebrates, including a small but beautiful collection of Philippine shells, and numerous specimens of a miscellaneous nature.

ENTOMOLOGY. This department now occupies three rooms on the third floor of Agricultural Hall—one office, one laboratory, and one class room. The entomological class room is equipped for twenty-four advanced students. It also contains the entomological collections and extension materials. The research laboratory is fully equipped with up-to-date apparatus for carrying on all kinds of research problems. The entomological library is exceedingly rich in old volumes and complete sets of entomological periodicals. Through the kindness of the librarian of the U. S. Department of Agriculture, students in this department have access to all publications contained in the library of the Department of Agriculture and the library of Congress.

FORESTRY. The department of Forestry occupies the third floor of Science Hall. It has a complete herbarium of the forest trees of the Pacific Coast, as well as a cone and seed collection representing the important commercial trees of the United States. It has apparatus for applying preservatives to timbers by the open tank method, timber testing machinery, incubators for testing tree seeds, wood specimens, stereopticon and slides, compound and low power microscopes, hypsometers, increment borers, scale sticks, calipers, Biltmon sticks, transits, surveyors' compasses and chains, pack outfits, axes, saws, draughting tables, and other equipment necessary for efficient laboratory and field work. Valuable collections of tools used in logging have been loaned the department by several commercial companies. The City Water Company of Corvallis has placed a timbered tract of eighty acres at the disposal of the College for demonstration purposes, while the entire city watershed of more than 7,000 acres is used as a basis for practical field work.

DOMESTIC SCIENCE. This department is located in the new Home Economics building and occupies the basement, first floor, and one-half of the second floor of the completed east wing of this structure. There are five large laboratories, with excellent modern equipment for all types of food preparation. A small laboratory is equipped with various kinds of cooking apparatus and is designed for experiment work. Adjoining the experimental laboratory is a dining room large enough to accommodate twenty people. This is used for meal serving and enables the students to put into actual practice the knowledge gained elsewhere.

The laundry in the basement is supplied with all modern conveniences and labor-saving devices. Ample class rooms, locker rooms and rest rooms are provided for the use of the students in the Home Economics course.

DOMESTIC ART. The entire third floor and half of the second floor of the new Domestic Science wing of the Home Economics building is allotted to the work in Domestic Art. There are six large laboratories with locker and dressing rooms adjoining each. The rooms are supplied with the best type of equipment available. The most improved sewing machines, good electric irons, ample wardrobes for unfinished work, and large display cabinets for finished work, are conveniently arranged. Excellent exhibit cabinets for the educational collections of cotton, wool, silk, and linen have been supplied.

CIVIL AND HIGHWAY ENGINEERING. In addition to joint use with the other engineering departments of the testing laboratories described elsewhere, this department has a suite of well-lighted rooms, suitably arranged on the second floor of Mechanical Hall. This suite includes an office, recitation, and lecture rooms; an instrument room, and draughting and designing rooms, together with a well-equipped blue-print room with a cylindrical electrical blue-print machine, sun frames, and washing pans.

The draughting and designing rooms are well lighted and fully equipped with thoroughly modern and convenient drawing tables, supplied with individual lockers for instruments and other apparatus. The instrument room is conveniently arranged, having an individual glass-front case for each instrument and its accompanying equipment, which includes marking pins, tape, range-poles, notebook, etc. The instrument equipment includes the following: twelve transits, four of which are provided with solar attachment; eight levels, four plane-tables, one compass and two current meters, all high-class instruments of various standard makes and styles; a sufficient supply of level and stadia rods, range-poles, tapes, chains, plain and prismatic compasses, aneroid barometers, clinometers, planimeters, plumb-bobs, hand levels, etc., together with a well-selected assortment of specifications and blue print plans of engineering structures for illustrative purposes.

IRRIGATION ENGINEERING. The excellent equipment of the Civil, Highway, and Experimental Engineering departments, as de-

scribed elsewhere under this caption, is available for use by the students in the Irrigation Engineering department. Besides the draughting rooms and laboratories, the student has the use of transits, levels, plane-tables, current meters, and tapes for practical work, as well as pumps, water meters, rams, and small water wheels of the Experimental Engineering laboratories for experimental work. Facilities for experiments with small weirs and orifices are also provided.

In addition to the above facilities, the proximity of the Wilamette and Mary's Rivers, Oak Creek, and the mill race of the Corvallis Flouring Mills affords excellent opportunity for practice in stream gauging.

ELECTRICAL ENGINEERING. The laboratory of this department occupies a large part of the west half of the first floor of Mechanical Hall, and is divided into several rooms, one for testing, one for instruments, and another for supplies. Besides the equipment therein, including generators, motors, and other apparatus, the machinery in the College Power Plant and sub-station, is available for study and testing purposes. Three-phase electrical energy is supplied by the long distance transmission line or by the local generating unit as desired.

In the laboratory is a $6\frac{1}{2} \times 15$ foot switchboard, consisting of three asbestos wood panels on which are mounted a number of voltmeters and ammeters for direct and alternating current; a power factor meter; a frequency meter, and synchroscope; a set of synchronizing lamps; circuit breakers; switches; and a large number of plug terminals, the leads of which extend to the four machine platforms; two slate panels with instruments and switches for direct current machines; and an arc light regulating panel. Immediately adjacent thereto is a controller, auto-transformer and rheostat rack, six feet high by sixteen feet in length.

The machine platforms just mentioned are four feet wide by fourteen feet long, and have upon them the following equipment: one five, one seven and one-half, one ten, and one fifteen horsepower, three-phase, induction motors; two five, two seven and one-half, two ten, and two twelve and one-half kilowatt, 125-volt direct current generators; one ten-kilowatt double current generator, and one two-kilowatt rotary converter; two two and one-half kilowatt induction motor generator sets; one two and one-half

kilowatt synchronous motor generator set; one seven and one-half kilowatt revolving field alternator, with three additional rotors, and one seven and one-half kilowatt revolving field alternator, from both of which current of one-, two-, three-, four-, and six-phases may be taken; one five-arc light regulating, one ten-kilowatt 110,000-volt high tension testing, one ten-volt 1000-ampere welding, one five kilowatt 15,000 volt wireless, three $7\frac{1}{2}$ kilowatt, 2200-220,110-volt transformers with ten taps each in the secondary, giving nine different voltages from 24 to 220 volts, with 87% taps in both primary and secondary for transformation from three- to two-phases or the reverse, and a number of ordinary transformers and compensators.

The instruments available comprise standard portable volt, ampere, and watt meters which are divided into two groups, one of which is used for routine laboratory work, the other reserved for thesis and other tests in which greater accuracy is desired. In addition to this equipment, the departments of Physics and Electrical Engineering maintain an instrument standardization laboratory equipped with two one-hundred ampere storage cells and a group of dry cells to furnish potentials up to one hundred and fifty volts. The precision instruments and apparatus consist of a Leeds and Northrup potentiometer with certified standard cells and a complete line of standard shunts from one one-thousandth to ten ohms, a Weston laboratory standard voltmeter with ranges of 1, 100, and 200 volts and Siemens and Halske laboratory standard ammeters with ranges from 2.5 to 50 amperes and a similar wattmeter with five and ten ampere range.

Equipment for the study of illumination is described under the department of Physics.

MECHANICAL ENGINEERING. The laboratory equipment for this department in mechanics and power measurement, is described under Experimental Engineering. The shops are under the supervision of the department of Industrial Arts.

In addition to equipment listed under these two departments, there are two large draughting rooms, each with 40 drawing tables, drawing boards for each student, and a blue-print room, with printing frame, wash trays, etc.

EXPERIMENTAL ENGINEERING. Appropriate portions of the equipment for this work are utilized by all departments in Engineer-

ing and Forestry. The equipment comprises the following divisions: a materials testing laboratory, a cement testing laboratory, a steam laboratory, and a gas engine and hydraulic laboratory. These divisions have in common the equipment for the preliminary work, such as calculating devices, planimeters, Amsler integrator, micrometers, and other general apparatus.

The materials testing laboratory occupies the northwest corner of the first floor of Mechanical Hall and contains the following: a 150,000-pound Riehle universal testing machine fitted with extension table for beams up to 16 feet in length; a 50,000-pound Riehle automatic and autographic testing machine; a 60,000-pound-inch Olsen torsion testing machine; a 400-foot-pound drop testing machine and a static load testing machine, both of which were built in the College shops; a Case tempering furnace with pyrometer; Scleroscope and Brinell ball hardness testers; and auxiliary apparatus including a deformeter, torsion indicator, compression micrometers, several extensometers, deflectometers, and other minor pieces.

A part of the materials laboratory also is devoted to the testing of materials for highway construction. This equipment includes the following: Olsen impact machine for toughness tests; Riehle machine for hardness tests; ball mill, molding machine, and impact machine for cementing value tests on rock dust; rattler for abrasion tests on macadam or paving-rock, another for paving-brick; core drills and saw for cutting stone specimens; sieves for mechanical analysis of sand and aggregates, including a set of Tyler standard screen scale sieves. Penetrometer, viscosimeter, float test, centrifuge, and other appliances for making physical tests of bituminous cements and road oils.

The cement testing laboratory, also located in Mechanical Hall, is equipped with convenient glass-topped tables for mixing, intended to accommodate two students each. Apparatus is provided sufficient to make all the standard A. S. C. E. tests, as well as for some additional experiments. There are a large number of briquette, cube, and special cylinder molds, three Vicat needles, Gillmore needles, screens, including a standardized set, damp closet, aging tanks, boiling test apparatus, briquette molding machine, a 1000-pound Fairbanks cement testing machine, permeability apparatus for testing various mixtures or water-proofing compounds, and

small apparatus including balances, specific gravity flasks, trowels, sampling irons, etc.

The steam laboratory, located in the New Heating Plant, contains the following machines: a 7x8 throttling engine used principally for experiments on valve setting, a 9x10 Ideal automatic high-speed engine driving a 30 KVA, 3-phase generator, a 15 BHP, two stage Kerr turbine, an 8x18 simple Murray Corliss engine, and a 6- $\frac{1}{4}$ and 10- $\frac{1}{2}$ x6- $\frac{1}{4}$ Sturtevant vertical compound engine. The last three of these are so arranged that they may be run either condensing or with atmospheric exhaust. The condenser and vacuum pump are so equipped that the cooling water may be measured by means of a Venturi meter and the condensed steam by a Kennicott water-weigher. The engines are all fitted with gauges, sampling pipes, indicator connections, and brakes of various types.

For tests on boilers and their auxiliaries there are available the equipments of both the new and the old heating plants. The former consists of three Flanner water-tube boilers aggregating 700 horsepower; these are oil fired and fitted with modern auxiliary equipment, including feed water and oil meters, thermometer wells, flue gas sampler, etc. In the old plant there are three fire-tube boilers of about 170 horse-power total capacity, for which cord wood, and waste from the College wood shop are used for fuel.

Of smaller power laboratory equipment there may be mentioned a General Electric steam meter, pressure gauge tester, Schaeffer and Budenberg indicator calibrating device, seven indicators including a Trill instrument for continuous diagrams, several reducing wheels, two steam calorimeters, flue gas analysis apparatus, two pyrometers, draught gauges, recording and indicating pressure gauges, etc.

For work on power transmission, a transmission dynamometer and a special belt testing machine are provided. Tests may also be made on lubricants, bearing metals, and different types of bearings, by means of a Golden bearing and oil dynamometer, or a pendulum type oil testing machine. There are also at hand the usual minor pieces, as flash point apparatus, viscosimeter, etc.

The gas engine and hydraulic laboratory is located in the old Power Plant building. The gas engine equipment consists of three four-cycle and two two-cycle gasoline and oil engines, and an 8-inch Reeco-Ericson hot-air engine. All of these are specially fitted

for testing and demonstration. In the same room are also installed a Gardner air compressor and two centrifugal blowers for work on air compression and transmission. The hydraulic section contains the following: a centrifugal pump driven by a rated variable speed motor, several steam pumps, a 4x6 Goulds triplex pump, 12-inch Doble laboratory water motor, hydraulic ram, 2-inch Venturi meter, current meter, two ordinary service meters, calibrating tanks, orifice boxes with suitable plates and orifices, weirs, hook gauge, and other small apparatus. In addition to work in the laboratory, measurements and tests of neighboring streams and installations may be made.

THE WOOD SHOP, supplied with the best machines and tools the market affords, contains twenty-four double benches of modern design, accommodating forty-eight students. Each bench is provided with patent rapid action vises for holding the work, and is furnished with two sets of hand tools, consisting of rip saws, cut-off saws and backsaws, planes, chisels, paring gouges, marking gauges, try-squares, hammers, dividers, and oilstones. The machine equipment of this shop consists of fifteen wood-turning lathes, each furnished with a set of tools; one iron saw-table with rip and cut-off saws, one band saw, one jig saw, 24-inch surface planer, 16-inch glue joiner, post boring machine, and two grindstones. There are also two glue tables with clamps of various sizes and one steam and gas glue heater of three gallons capacity. The power is furnished by two three-phase induction motors of 15-horse-power each.

THE FORGE SHOP contains forty-two down draught forges of the most improved pattern. Blast is furnished by a steel pressure blower driven by a 10-horse-power induction motor, and the smoke and gases are removed by an 80-inch exhaust fan, driven by a 20-horse-power motor. Each forge is provided with anvil, hammers, hardies, tongs, and other small tools. There are also swedge blocks and vises at convenient points in the room for general use.

THE MACHINE SHOP contains one 24x24-inch iron planer, one 15-inch shaper, one 12-inch shaper, one universal milling machine, one universal tool grinder, one wet tool grinder, one radial drill, one 20-inch drill press, one sensitive drill press, one 20-inch engine lathe, one 16-inch engine lathe, one 16-inch universal turret lathe, one 14-inch modern geared lathe, five 14-inch engine lathes, two 10-inch speed lathes, one shop saw, one automatic knife grinder,

and twelve bench vises. A 20-horse-power induction motor furnishes the power. A tool room adjacent contains the small tools, such as twist drills, taps, dies, reamers, calipers, gauges and scales. These tools are given out to the students on the check plan.

The Plumbing and Steam Fitting Shop is equipped with all of the hand tools necessary for cutting, threading, and general pipe work, as well as gasoline torches, soldering outfits, and other apparatus for making lead pipe connections and wiped joints.

MINING ENGINEERING. The new Mines building provides spacious and well-lighted offices, laboratories, and lecture rooms for work in this department.

The Assaying and Metallurgical laboratory is a cement-floored room 30 feet wide and 60 feet long on the first floor of the building extending across the entire east end. It is amply lighted by windows on one side and both ends. At the south end of the room are the most modern type of oil-, and gasoline-fire furnaces for fusion and other fire work. Conveniently arranged nearby are suitable lockers and work tables with the necessary tools, fluxes, etc. The north end of the room is adequately equipped with sinks, ventilating hoods, gas burners, electric hot plates, and other paraphernalia for carrying on the various operations involved in parting buttons, assaying solutions, making cyanide tests, etc. One corner of the laboratory is partitioned off for a balance room and provided with the most delicate balances obtainable for weighing the gold beads. Balances of both the Keller and Ainsworth makes are available. These are mounted on a specially constructed table not connected with the floor, in order to avoid vibration.

The Crushing and Sampling laboratory in the basement is 25 feet by 30 feet. It contains a power driven sampler crusher of the latest design and one of the recently modeled disk grinders, for properly pulverizing samples for assay or other purposes. The usual bucking board and muller and other hand grinding devices are also available for use of the students at any time, together with the Jones sampler and other appliances used in preparing samples. Such work will all be done here, so as to keep dust and disturbance occasioned by such work out of the assay laboratory.

The Ore Testing laboratory is a room 25 feet wide by 30 feet long on the first floor of the building. It is equipped with appliances for studying the behavior of ores when subjected to the

various concentrating operations of jigging, vanner, table, and magnetic concentration.

The Ceramic laboratory occupies a room about 30 by 60 feet in the basement of the Mines building. There are also store and supply rooms contiguous to this laboratory. The equipment for the ceramics work consists of a laboratory for ceramic chemistry and apparatus for making physical tests of clays and other ceramic materials; a complete mechanical outfit for the preparation of clays for the manufacture of brick, tile, terra cotta, etc., and equipment for compounding of bodies, glazes, enamels for stone- and ironware, and all of the higher grade of pottery and porcelain. This outfit includes a combination dry-wet-pan, pug-mill, blunger, filter press, ball mills and other grinding machines, rolls, screens, potter's wheel, and an auger machine provided with dies for side- and end-cut brick, hollow block, drain tile, and roofing tile; a hand-power screw press with dies for dry press brick and flat tile; and an electric furnace for high temperature work.

In the ceramic laboratory are two kilns, a down draught burning crude petroleum, and a Caulkins pottery kiln; a steam dryer in which drying conditions can be accurately controlled; an electric and a radiation pyrometer; Seger volumeter; balances and other apparatus.

A ceramic library which contains the best works in both English and foreign languages and a ceramic museum are also important features of the working equipment of the department.

The Geological and Mining Museum on the third floor is fitted up with twelve glass-top cases and sixty feet of wall cases, in which are exhibited large and attractive specimens of minerals, rocks, and fossils, not only from our own State, but from all over the United States. In the museum will also be found large collections of the different manufactured geological products, including samples of all the different grades of brick, tile, pottery, terra cotta, and cement manufactured products, together with the raw materials from which the same are manufactured.

The Mining Draughting room is equipped with convenient desks and tables and all necessary equipment for the use of Mining students.

The Mineralogical laboratory possesses the following collections: No. 1, the Mineral Type Collection, consisting of about 1500

characteristic and labeled specimens used by the students for the purpose of study and comparison.

No. 2, an Exhibit Collection of minerals, consisting of large and attractive specimens.

No. 3, a Working Collection of minerals, consisting of about 7000 unlabeled specimens similar to those in the Type Collection.

No. 4, a Crystal Collection, containing about 1000 natural crystal forms.

No. 5, a Crystal Model Collection, consisting of 48 large glass crystal models and about 750 smaller wooden models used by the students in the study of crystallography.

No. 6, a Blowpipe Collection, containing minerals and metals used in blowpiping.

The Petrological laboratory contains the following collections:

No. 1, the United States Geological Survey Education Series of rocks, containing 165 characteristic rock specimens from all over the United States.

No. 2, the Foote Rock Collection, containing 150 specimens of characteristic rock types.

No. 3, the Structural Mineral Series, containing about 100 specimens of all the different rocks used for structural purposes.

No. 4, the Working Collection of rocks, containing about 2000 unlabeled specimens for the use of the students in the work of petrology.

COMMERCE. The School of Commerce, which occupies the top floor of the Agronomy wing of Agricultural Hall, is completely equipped for thorough and efficient work in modern business courses. Each room is specially designed and furnished for the work to be conducted in it. The furniture of the department consists of individual desks and counters, a complete set of modern banking fixtures, a wholesale house, a retail house, a commission house, freight, real estate and insurance offices. Permanent blank books, letter files, rubber stamps, copying presses, college currency, blanks, and similar material are provided by the College. A Burroughs Adding Machine is in constant use in the department. The room for typewriting contains twenty standard machines, each provided with approved conveniences for the operator. The room for stenography is furnished with tables designed for conveniences in practical work, as well as in equipment for illustrating

various systems of filing. The department of Political Economy is developing a commercial museum for use in the various courses in social science.

PHARMACY. This department has its lecture rooms and laboratories in Science Hall, a building which amply meets the needs for space, light, and ventilation.

In the way of equipment, in addition to the usual permanent fixtures such as desks and apparatus for the individual students, the department is supplied with a number of special pieces of apparatus for general use, such as pharmaceutical stills, from the simple retort to the complicated vacuum still; drug mills, for hand and power; suppository machines, for fusion and for compression; tablet machines, mold and compression; pill machines; tincture presses; capsule filling machine; percolators and much minor apparatus.

ART AND ARCHITECTURE. (*a*) *Art.*—The department occupies three commodious, well-lighted studios on the fourth floor of Agricultural Hall. The rooms have north light, are well heated and ventilated, and furnished with suitable studio material, such as easels, drawing tables, portfolio racks, cast forms for models, architectural pieces, and a number of figure pieces in full and bas-relief. There is also a good collection of still life objects. (*b*) *Architecture.*—The department is temporarily accommodated on the third floor of the Mines building, where an office, which also serves as a draughting room for the instructor, is provided, together with a large drawing room, fitted with suitable desks, and facilities for recitation purposes. The department is well supplied with wall drawings, pictures, and portfolios illustrating different phases of the work.

The College Library has a well-selected and growing reserve in art and architecture.

CHEMISTRY. The department of Chemistry occupies nearly the whole of Science Hall, except the fourth floor, which is occupied by the department of Pharmacy, and a few rooms on the third floor that are at present used by the Forestry department. The Chemical department of the Experiment Station has four rooms on the second floor.

The largest room in the building is the main general laboratory, which will accommodate 550 students in four sections. Adja-

cent to this laboratory is the general stock room, that in itself is a division of the department. It is well stocked with all the necessary apparatus and chemicals required for all the courses given in the department. One of the greatest improvements in the Chemical department is the new gas machine; this, when working at its full capacity, can supply gas for 800 burners.

The new organic laboratory has been increased in size until it now contains room for 240 students. The equipment is of the best.

The new qualitative analysis room now has accommodations for 96 students in four sections. Its equipment of hot and cold water, gas, pressure pumps, etc., makes it as good as the best.

The quantitative analysis room can accommodate 50 students in three sections. Great pains have been taken to make this room as nearly an actual chemical work room as possible.

In the balance room there are 23 analytical balances, most of which are used by the students in agricultural chemistry, and in food chemistry.

The main lecture room which is situated on the third floor, has a seating capacity of 150. It is provided with lecture tables that are supplied with gas, electricity, and water. Adjoining the lecture room is a small preparation room, in which is kept all special apparatus used for lecture demonstration, as well as supplies for the agricultural laboratory. This room is supplied with all the necessary apparatus for the proper elucidation of the principles of this branch of chemistry.

For work in Agricultural Chemistry an entire room is set aside. This room is fitted with gas, water, and electricity; condensers for distilled water; batteries; extraction apparatus for fats; nitrometers; Kjeldahl apparatus; hot water filtering apparatus; grinders for fodders, steam and air baths, calorimeter, polariscope, Westphal and analytical balances; coarse balance for rough work, hot-plates, and minor apparatus. This is one of the strongest divisions in the department and is lacking in nothing that makes a fully equipped agricultural chemical laboratory.

PHYSICS. The physical laboratory has a good working equipment for the study of general physics, the apparatus being such as to allow a qualitative or quantitative verification of all of the im-

portant laws by the student in the laboratory and by the instructor in the lecture room. In addition to the general laboratory, the department has two special laboratories, one equipped for electrical measurements and the other for photometry. A partial list of the apparatus found in these follows: standard cells, shunts, capacities and inductances; secohmeter; Leeds and Northrup potentiometer; Siemens and Halske standard ammeters, voltmeter, and portable testing set; Paul unipivot testing set; storage cells of large current capacity for ammeter and wattmeter calibrations; 10½-inch spark coil; Gaede pump; large Tesla coil; Leeds and Northrup photometer fitted with lamp rotator, rotating sector, Lummer-Brodhun screen, and Bechstein flicker photometer.

THE WOMEN'S GYMNASIUM is equipped with lockers and dressing rooms having accommodations for every College woman. A room for corrective gymnastics and a rest room, on the ground floor, are adequately equipped for their respective purposes. In the shower-bath room, hot and cold water are available throughout the year, and free towels are furnished to the students. The floor of the gymnasium is surmounted by a balcony running-track, and a capital playing space is provided for basketball and other indoor games.

The equipment includes horizontal bars, vaulting horses and bucks, parallel bars, swinging rings, traveling rings, Swedish boom, Swedish stall bars, climbing ropes, dumb-bells, Indian clubs, and wands.

The girls' athletic field provides facilities for such games as cross ball, basketball, soccer, hockey, and tennis.

THE MEN'S GYMNASIUM is equipped with lockers and dressing rooms having accommodations for all of the men of the College. In the shower-bath room, hot and cold water are available throughout the year, and free towels are furnished to the students. The main floor of the Gymnasium is surmounted by a balcony running track, 12 feet wide and 14 laps to the mile. The main floor space provides for basketball and other indoor games. The equipment includes horizontal bars, parallel bars, vaulting horses and bucks, swinging rings, traveling rings and ladders, Swedish wands and stall bars, climbing ropes, mats, dumb-bells, Indian clubs, and chest weights. The athletic field adjoining the gymnasium on the south, has within its bounds a quarter-mile running track, football grid-

iron, and baseball diamond. Bleachers and grandstand accommodate the spectators.

THE EXPERIMENT STATION

The Station bears an important relation to the College, as the scientific investigations conducted at the Station strongly support the instruction given in the class room. Aside from the original investigations of economic significance to agriculture, the work of the Station affords daily object lessons in modern farm methods.

About 300 acres of land are devoted to the use of the Station workers. This land is utilized by the various departments represented in Station organization, including the departments of Chemistry, Agronomy, Horticulture, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Entomology, Bacteriology, and Botany and Plant Pathology. Each department is actively engaged in the scientific investigation of problems presented by the different branches of agriculture.

As an illustration of the comprehensive character of this work, the following investigations, taken at random from the list of those now being conducted by the Station workers, may be cited. The value of such work, as an object lesson to the students in the various fields of agriculture, can hardly be overestimated. There are experiments with long and short rotation systems for the improvement of soil fertility; tests to determine and develop the best varieties of corn for Oregon conditions; tests to ascertain the adaptability and value of alfalfa for soiling and pasture; tests to determine the adaptability of kale as a winter succulent feed for dairy cows and other stock; experiments in breeding wheat for increase in both quantity and quality of yield, and improvement in adaptation to soil and climatic conditions of the Willamette Valley; experiments in testing the value of irrigation in Western Oregon for general farm crops; tests for comparing the merits of Loganberries and phenomenal berries; tests in utilizing fruit and vegetable by-products, with especial attention given to the Loganberry; variety tests of strawberries; experiments in cross pollination of apples; investigation of gummosis of the cherry; a study of the effects of the lime-sulphur spray under varying conditions; investigations of apple tree anthracnose; peach spot, potato blight, and

celery leaf blight; investigations as to the relation of speed, the temperature, and the fat content of milk, to the cream produced by cream separators; cooperative investigations with the department of bacteriology relative to the best manner of using "cultures" in butter and cheese making; breeding for egg production; experiments in incubation to discover, if possible, the cause or causes of the great losses in artificial incubation; comparisons between hen-hatching and incubator-hatching; the humidity conditions of natural and artificial methods of incubation; carbonic acid gas as a factor in incubation; feeding experiments to determine the value of various forage crops and cereals for the growing and fattening of hogs; experiments in the feeding of dairy cows; experiments in grazing and fattening swine; investigations in the economical production of beef and mutton.

COLLEGE ORGANIZATIONS

One of the most important factors in rounding out the results and benefits of a college course is the society, club, or association work. As a result of the diverse interests of college life and the varied tastes of the students, the following organizations are maintained by students and faculty:

THE STUDENT BODY ASSEMBLY. This is an organization of the entire student body, working under a constitution and by-laws approved by the faculty, and having general authority over all student enterprises. In order to secure an effective administration of the business coming within its jurisdiction, there are permanent committees on athletics, publications, oratory and debate, and such special committees as the assembly may by vote determine. Officers are elected yearly, and nominations and elections are conducted in a manner similar to that of the State electorate.

STUDENT SELF-GOVERNMENT. A system of student self-government has been established at the College which places the general disciplinary powers of the institution in the hands of the students. The Student Council, an organization made up of thirteen students, seven of whom are seniors, three juniors, two sophomores and one freshman, has been created and vested with such powers as are necessary to enforce the rules and regulations adopted by the

students. Members of the Student Council are elected annually by popular vote of the student body.

THE LITERARY SOCIETIES. These six organizations—Utopian, Clinonian and Adelphae, for women; and Zetagathian, Athenaeum, and Shakopean, for men—have the common purpose of promoting literary work among the students. The weekly literary programs and occasional joint meetings tend to this end. To stimulate interest in debate and oratory, there are held during the year intersociety, intercollegiate, and interstate contests. Gold medals and cash prizes are presented to the winners in the contests, and the successful society in debate receives the "Gatch Cup." This is the silver cup that was presented in 1901 by Dr. Thomas M. Gatch, then president of the College, to the society that had received highest honors in the season's debates. Annually this cup is to go to the successful society in the debates, but it is ultimately to become the property of the society winning it three years in succession. Many and determined have been the battles for its possession, but the cup is still without a permanent home.

THE CHRISTIAN ASSOCIATIONS. The religious work of the College is well cared for by the Young Men's and Young Women's Christian Associations, these organizations being particularly strong. The construction of Shepard Hall, the new student building, has materially increased the scope and added to the effectiveness of the work. The Associations aim to provide a moral atmosphere and pleasant social advantages for the students. Religious meetings are held in the rooms of these organizations every Sunday afternoon, and Bible study classes are regularly conducted. On registration days, committees are on hand to assist students in adjusting their work satisfactorily, and in securing comfortable quarters in good homes. Those who wish to make their way through College, will find the employment agencies always ready and glad to assist them as far as possible in procuring positions.

THE ATHLETIC ASSOCIATION. This organization, maintained by the students through the student body assembly, encourages wholesome competition in the various outdoor and indoor sports and pastimes. It has charge of all details pertaining to the conduct of intercollegiate athletics in which the College may be interested. A

committee of the faculty has general supervision over the whole subject of athletics, thus insuring a sound and conservative management.

COLLEGE FOLK CLUB. This club was organized in October, 1908; membership is open to all women of the faculty and other women employees of the institution, and to the women members of the immediate families of the faculty and other employees. The object of the club is social diversion, general culture, and the promotion of the best interests of the College. The organization at this time is divided into three sections: Art and Music Section, Sociology Section, and Mothers' Section. Aside from the semi-monthly meetings of the various sections, the general club convenes on the first Saturday of each month, at which time an address is given by an outside speaker, or a musical or literary program is furnished by members of the club, to which the public is invited. In January, 1913, the organization became affiliated with the Oregon State Federation of Women's Clubs. It is the purpose so to extend the work of the club as to effect the greatest possible good to the College and to the city.

THE MASK AND DAGGER. This club was organized for the purpose of offering special training in dramatic art. An annual "try out" is held in which all students of the institution may participate, and any who possess talent in this direction may be elected to membership in the club. No student, however, will be permitted to take part in a public production who has not an average for all of his College work, at the time the play is being prepared, of 80 per cent. Platform exhibitions will be given and standard plays presented during the College year.

THE ORATORICAL ASSOCIATION. This body has immediate charge of all business pertaining to the competitive work in oratory and debate. Schedules, dates, prizes, conditions of competition, and all similar matters are in its care.

INTERCOLLEGIATE DEBATE AND ORATORY. Each year the Oregon Agricultural College has at least one intercollegiate debate, putting into the field two teams, one supporting the negative and the other the affirmative of the same question. The College also sends one representative each year into the State Oratorical Contest in which

eight colleges take part. Gold medals are awarded to the men who represent the College in these events.

LOCAL DEBATE AND ORATORY. A local peace oratorical contest is held annually, to the winner of which the Cosmopolitan Club of the College presents a \$10 prize. There are also interclass contests in Declamation, Debate, Oratory, and Extempore Speaking, prizes being awarded by the Oratorical Association to the winners of these events. These latter contests are forensic events in the annual Interclass Forensic-Athletic Championship Contest, wherein the four classes compete for individual prizes and three loving cups—the Shakopean Cup, which becomes the permanent property of the highest individual forensic point-winner of the class winning the championship; the Orange O Cup, which becomes the property of the best athlete in that class; and the Barometer Cup, which is held one year by the class winning the interclass championship.

THE SPHINX. This is the senior honor society. Membership is acquired by election based on prominence in student activities and scholastic excellence.

THE JUNIOR AND SENIOR HONOR SOCIETY. This society was organized by the junior and senior classes in the spring of 1914, its primary purpose being to recognize efficiency in scholarship among junior and senior students. Election is made to the society by its own membership. The fact that high standards of general excellence have been set by charter members makes it a decided honor to any student to be elected to membership.

THE COSMOPOLITAN CLUB. This is an organization of foreign and American students. It is a local chapter of the Association of Cosmopolitan Clubs of the World. Its purpose is to provide social and educational advantages for its members and to promote international friendship. At present, nine nations are represented in the local chapter.

THE AGRICULTURAL CLUB. This club was established for the purpose of advancing interest in the various phases of agriculture, and promoting the investigation and discussion of both general and special agricultural subjects. Suitable programs are prepared for each meeting, and whenever practicable, leading authorities on practical agriculture are engaged to address the members.

THE LEWELLING CLUB. This is the Horticultural Club conducted under the auspices of the Horticultural department. There

is no regular organization, except an executive committee, which has power to transact such business as requires action on the part of the club. It is open to all students interested in horticulture.

DELTA THETA SIGMA. There is established at the College a local chapter of this national honorary agricultural fraternity. The aim of the society is to advance the study of agricultural subjects by giving honorable recognition to students taking the lead in the work. Elections to membership are made by the members of the local chapter from the junior and senior classes.

THE FOREST CLUB. This is an association of students and instructors "formed for the purpose of promoting the forestry interests of the State." In order to carry out its purposes, it meets twice each month. The first meeting of each month is purely of a social nature, with each alternate meeting for the discussion of current forestry literature, magazine articles, news items, legislation, and general progress movements pertaining to forests, forest service, forest products, forest industries, lumbering, and the lumber trade.

THE CIVIL ENGINEERING CLUB. This is an organization within the department of Civil Engineering. The active membership is drawn from the junior and senior classes, and the privilege of associate membership is extended to the members of the two lower classes. It meets weekly for the discussion of subjects of interest to the civil engineer.

THE ELECTRICAL ENGINEERS. This is a College branch of the American Institute of Electrical Engineers. The aim of the organization is to discuss the topics contained in the monthly proceedings of the A. I. E. E., and in this way develop in the student an intimate knowledge of the activities of the national organization, thereby coming into closer touch with the practical problems in the engineering world and becoming better fitted for their life work.

THE MINERS' ASSOCIATION. This body has for its object the discussion of technical engineering subjects; the review of current mining literature; the presentation of original papers by the active members; and occasional lectures on special mining topics by men outside of the College.

MECHANICAL ENGINEERS. This is a local College society of students and faculty people interested in Mechanical Engineering. The

purpose of the association is to keep in touch with the practical problems of the engineering world.

SIGMA TAU. This is a local chapter of the national honorary engineering fraternity, chapters of which are at nearly all of the recognized technical schools of the United States. Membership in the fraternity is restricted to junior and senior students in Engineering and Forestry, election to membership being based principally upon excellence in scholarship.

THE HOME ECONOMICS CLUB. This is an organization for the purpose of bringing all the women of the School of Home Economics into closer touch with one another than is possible without a central organization. The aim of the club is to give, by a series of monthly meetings, a general survey of Home Economics questions not covered in regular class room work. The aim is carried out by means of well-directed discussions and by securing outside lecturers who by virtue of their training and experience are considered authorities on subjects relating to Home Economics.

THETA chapter of Alpha Kappa Psi, a national fraternity devoted to the profession of Commerce, was organized during the school year of 1913-14. The purpose of the fraternity is to promote investigation along scientific lines in all phases of commercial work. Membership is open only to students in the junior and senior year in the School of Commerce; and in order to become a member, the student must have shown himself a leader both in scholarship and in student activities.

THE COMMERCIAL CLUB. This is a student organization within the School of Commerce. The purpose of the club is to bring its members into close relation with current methods and events in the commercial world. This is accomplished by discussions of topics pertaining to commerce by members of the club, and by addresses at various times during the year by men prominent in the fields of law and business. Active membership is open to all members of the School of Commerce.

THE PHARMACEUTICAL ASSOCIATION. The main purpose of this organization, which consists of the pharmacy students, is to bring its members into closer relation with the current events of the pharmaceutical world. This is brought about by discussions in

the meetings of topics pertaining to pharmacy, and by addresses at various times during the year by prominent pharmacists and salesmen of the State.

THE EASTERNERS' CLUB. Membership in the Easterners' Club is open to all students and faculty people who have at any time resided in those states situated east of the Mississippi River, or in those provinces of Canada east of Manitoba. The objects of the club are to promote the interests of the College throughout the East, to encourage prospective students from the East and to offer social diversion to its members by providing occasions for the mingling of ideas on such current events as the sports, and politics, which are represented by the various states included within the membership.

THE EASTERN OREGON CLUB. This is an organization effected for the purpose of promoting the mutual interests of the College and the people of the eastern part of the State. Its members are afforded many social and intellectual advantages from the regular club meetings. Membership is open to all students from Eastern Oregon.

THE CALIFORNIA CLUB is, as the name implies, composed of students whose homes are in California. It is for the purpose of bringing "Californians" together socially that the club meets.

THE PORTLAND CLUB is composed of all of the students registering at the College from Portland, the primary object of the club being social diversion among those students who have been associated in their high school work in previous years.

COLLEGE PUBLICATIONS

Two classes of publications are issued from the College; one, official, published by the College authorities; the other, unofficial, published by the various student organizations.

The College publications include:

THE CATALOGUE. The General Catalogue is published at the close of the College year, and contains much general and specific information as to the courses of study, equipment, and instruction, and gives a list of faculty members and students for the year.

THE ALUMNI DIRECTORY. This publication gives in each edition revised information as to the name, year of graduation, degree, present occupation, and present address of each graduate of the College.

THE BULLETINS OF THE SUMMER SCHOOL. These announcements contain specific information of expenses, courses of instruction, character of the work presented, and the requirements that prospective students must meet.

THE BULLETINS OF THE WINTER SCHOOL. These announcements carry such information regarding the winter courses as may fully present the advantages of these courses to the public.

EXTENSION BULLETINS. These bulletins consist of monographs on the various phases of Agriculture, Domestic Science and Art, Engineering, Mining, and Commerce, together with the bulletins and circulars issued in connection with the Industrial Club work for boys and girls in the public schools. They are written in such style as to be easily understood, thus meeting the popular demand for scientific knowledge and giving it in such form that the people of the State may profit by its application to the problems of everyday life.

THE STATION BULLETINS. These publications comprise two series. The first, or standard series, includes reports upon experimental investigations in agronomy, horticulture, dairying, animal husbandry, poultry husbandry, insect pests, plant diseases, and special subjects of interest to the husbandman. The second, or research series, includes publications dealing with special research problems.

STUDENT PUBLICATIONS

The student publications comprise:

THE BAROMETER. In March, 1896, the literary societies of the College began the publication of a monthly periodical, the "O. A. C. Barometer." The enterprise has met with deserved success, and "the organ of the student body" is now issued as a four-page, five-column semi-weekly. It publishes the "news of the College," and is of general public importance as representing the interests, character, and accomplishments of the student body of the College. By action of the Board of Regents, resulting from a unanimous recommendation of the Student Body, a portion of the regular semester student fee of \$2.50 will be devoted to the "Barometer," and every student will regularly receive the paper.

THE ORANGE. This is the annual publication of the junior class, and made its initial appearance in 1907. It is a high-class

publication, substantially bound, and fully illustrated with photo-engravings, pen and ink sketches, line and wash drawings. It is a full dress carnival of the year's life, representing the dignity, the beauty, the versatility, the gaiety, the traditions, the sentiment, and the solidarity of the Oregon Agricultural College.

THE OREGON COUNTRYMAN. This is an illustrated monthly magazine, published by the Agricultural and Home Economics students under the supervision of the faculties of these courses. Besides dealing with the work of the various departments in a practical manner, it contains articles of scientific value contributed by the Experiment Station workers. Successful men and women of the State contribute articles for each issue.

THE STUDENT ENGINEER. This is a magazine devoted to engineering and mechanic arts. Its purposes are to record the engineering progress in the Northwest; to furnish news; to discuss methods relating to the mechanic arts; to publish records of scientific work done by the students in this institution; and to publish any matter of special technical and scientific interest. Items of interest will be found for civil, mining, mechanical, and electrical engineers, and for others who are engaged in technical pursuits. The journal is under the supervision of the faculty of the School of Engineering and Mechanic Arts, but the work and responsibilities of the publication are borne by the staff, elected by the students of the School of Engineering.

THE C-P JOURNAL. This magazine, published quarterly by the students of the Commerce and Pharmacy departments under the supervision of the faculty of the two schools, is devoted to the commercial and pharmaceutical interests of the school and State. Articles of merit are contributed for each issue by students, faculty, and prominent business men of the State. One distinguishing feature of the C-P Journal is the publication each semester of a complete directory of all the members of the institution, students, faculty, and employees.

STUDENT EXPENSES

GENERAL FEES

Tuition is free to all students, regardless of the place of residence. The regular College fees required of all students, with the

exception of special students in music who take no other College work, are as follows:

Entrance fee, payable annually on registration....	\$5.00
Incidental (Student) fee, payable each semester..	2.50
Diploma fee on graduation.....	5.00
Binding fee for graduation thesis.....	1.00

LABORATORY FEES AND DEPOSITS

Students are charged small fees in the different laboratory courses to cover the cost of material used; and deposits are required to cover cost of breakage in laboratory courses where breakages are likely to occur. These fees are payable at the beginning of each semester. At the end of the semester, deduction is made for actual breakage, and the balance of the deposit is refunded to the student. The fees and deposits charged each semester in the different courses are as follows:

AGRONOMY:

Fees Deposits

Courses A, B, 101, 105, 201, 202, 203, 204, 205,		
208, 211, 301, 302, 303, 306, 404, 505.....	\$.50	\$
Courses C, 103, 104, 111, 304, 311, 401, 402, 405..	1.00	1.00
Courses 102, 403, 411.....	1.00	2.00

ANIMAL HUSBANDRY:

Courses 1, 16.....	.25
Courses 210, 220, 230, 240.....	.50
Course 2.....	1.50

ART AND ARCHITECTURE:

Art—

Courses 102, 103, 204, 205, 206, 305, 306, 409,	
410, 411, 412, 503, 504, 505, 506, 522, 526.....	.50
Courses 413, 414, 525, 600, 601.....	1.00

Architecture—

Courses 503, 504, 505, 506, 507, 508, 509, 512,	
513, 514, 515, 518, 521, 522, 525, 526, 527,	
528, 531, 532, 533.....	.50
Courses 501, 502, 510, 511, 516, 517.....	.75
Courses 519, 520, 529, 530.....	1.00
Courses 523, 524.....	2.00

BACTERIOLOGY:*Fees Deposits*

Courses 101, 102, 201, 202, 204, 205, 300, 302, 401, 406, 501, 502, 600.....	2.00	1.00
Courses 111, 112, 701.....	2.50	1.00

BOTANY:

Courses 82, 83 (per credit).....	.50	
Course 105.....	1.00	
Courses 30, 31, 41, 42, 45, 62, 66, 70, 71, 101, 102, 104.....	1.50	
Courses 22, 36, 64, 111, 115, 116.....	2.00	
Courses 50, 51.....	2.50	2.00

CERAMICS:

(See Engineering—Mining.)

CHEMICAL ENGINEERING:

(See Engineering—Mining.)

CHEMISTRY:

Courses 100, 101, 102, 103, 200, 201, 202, 300, 301, 400, 401, 402, 409, 500, 501, 502.....	3.00	2.00
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CIVIL ENGINEERING:

(See Engineering.)

COMMERCE:

Courses B, C, 100, 101, 102, 103, 404, 405, 410, 411, 412, 413.....	1.00	
Courses R, S, 400, 401, 402, 403.....	2.00	

DAIRY HUSBANDRY:

Courses A, 1.....	1.00	2.00
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DOMESTIC SCIENCE:

Courses E, K, 510.....	.50	
Courses M, 190, 202.....	2.00	
Course 180.....	2.50	
Courses C, D, 101, 102, 103.....	3.00	
Courses 104, 105.....	3.50	
Course 201.....	4.00	
Courses H, I.....	6.00	

DOMESTIC ART:

Courses 101, 102, 103, 201, 202, 203, 204, 501, 502, 601, 801, 802.....	.50	
Courses 301, 701.....	1.00	
Courses 401, 404.....	3.00	

ENGINEERING:

*Fees Deposits**Civil—*

Courses 105, 111, 511.....	.50	
Courses 222, 223, 232, 233, 242, 243, 251, 272, 274, 513, 514, 553.....	1.00	

Electrical—

Courses 101, 102, 103, 105, 106, 108, 110.....	.50	
Courses 201, 202, 203, 402.....	2.50	3.00

Experimental—

Courses 207, 208, 210, 237, 238, 262, 272.....	2.00	
Courses 201, 202, 203, 204, 205, 206, 231, 232, 233, 235, 240.....	3.00	
Courses 291, 292 arranged according to work undertaken.		

Irrigation—

Courses 204, 301, 402.....	1.00	
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Mining—

Courses 161, 171.....	1.00	
Courses 111, 112.....	3.00	
Course 401.....	7.50	
Courses 212, 323.....		2.00
Courses 301, 423.....		5.00

ENTOMOLOGY:

Courses 301, 302, 303, 304, 305, 306, 308, 309, 312, 317.....	1.00	
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FORESTRY:

Courses 201, 202, 203, 204, 301, 302, 303.....	1.00	
Course 504.....	1.50	
Courses 501, 502.....	2.00	

GEOLOGY:

(See Engineering—Mining.)

HORTICULTURE:

Course 123 .....	.50	
Courses 101, 103, 104, 105, 201, 401.....	1.00	
Course 125.....	3.00	

INDUSTRIAL ARTS:

Fees Deposits

Courses 116, 152, 153, 202.....	1.50	2.00
Courses G, L, 105, 111, 112, 113, 114, 115, 116, 131, 132, 134, 154, 155, 156, 171, 202, 203, 204, 206, 207, 208, 209.....	3.00	2.00
Courses 103, 104, 135, 136, 175.....	4.50	2.00
Courses A-1, A-2, A-3, B-1, B-2, B-3, E-1, E-2, E-3, F-1, F-2, F-3, J-1, J-2, J-3, K-1, K-2, K-3, M-1, M-2, M-3, N-1, N-2, N-3, P-1, P-2, P-3, Q-1, Q-2, Q-3, T-1, T-2, T-3, U-1, U-2, U-3, V-1, V-2, V-3, W-1, W-2, W-3.....	6.00	2.00

IRRIGATION ENGINEERING:

(See Engineering.)

MINING ENGINEERING:

(See Engineering.)

PHARMACY:

Courses 130, 140.....	.50	
Courses 160, 161.....	3.50	
Courses 111, 112, 151.....	5.00	1.00

PHYSICAL EDUCATION:

All courses.....	1.50	
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(All students using the Gymnasium pay the fee of \$1.50 per semester, for which they are given use of all equipment, baths, and are furnished with towels, soap, and medical supplies for injuries.)

PHYSICS:

All courses.....	2.00	
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POULTRY HUSBANDRY:

Courses 1, 2, 6.....	1.00	
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VETERINARY MEDICINE:

Courses 3, 4, 11, 14, 15, 18.....	.50	
Courses 2, 5, 6.....	1.00	
Course 1.....	2.00	

ZOOLOGY:

Courses 101, 102, 103, 104, 105, 108, 109, 201, 202, 204, 206, 207, 208.....	1.00	
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BOARD AND ROOM

WOMEN'S DORMITORIES. Waldo Hall and Cauthorn Hall, with their large airy parlors, halls, music and play rooms, are pleasant residences for the young women who come from distant homes. The buildings are supplied throughout with pure mountain water, both hot and cold, electric lights, steam heat, and all modern conveniences. The rooms are furnished with an iron bedstead, a mattress, a chiffonier, a table, and chairs. Such other materials as are needed to make the furnishings complete, including pillows, pillow cases, sheets, blankets, bedspread, are furnished by the student; and many of the students prefer to make the rooms more homelike by bringing rugs, curtains, pictures, sofa cushions, etc. These latter articles, however, are not at all necessary. The rooms are cheerful and comfortable without additional furniture. The bedrooms average about 12 feet by 15 feet, with one window 3 feet by 7 feet. Many of the rooms are larger, and a few of them have two windows. Each student also furnishes her own towels and table napkins. Students who room together may choose to have a double bed or two single ones. Their preference must be indicated with application for a room. No definite promise for a single room can be made, the privilege of rooming alone depending upon the number of applications for rooms. The many advantages of having a roommate should not be overlooked by the student in making her plans for college life.

The conditions of living in Waldo Hall and Cauthorn Hall are such that the College considers it a distinct advantage to the women students to live in these halls of residence. A wholesome, busy, student atmosphere is maintained. Reasonable freedom is allowed, but week nights are reserved for study. All girls entering the College are expected to live either in one of the dormitories or in homes selected by the College Officials, unless their parents reside in the city, or they are given special permission to live with relatives or friends who assume the responsibility of their care.

The expenses of living for each student in the dormitories are as follows:

Room deposit	\$ 3.00
Room rent per semester—	
Single room	20.00
Double room	10.00
Board per week, payable monthly in advance.....	3.50
Incidentals, such as laundry fee, electric iron fee, etc., per semester.....	2.00

The deposit is returned to the student at the close of the semester or school year, in case the room is maintained in a condition satisfactory to the Preceptress.

Young ladies wishing to reserve rooms should send the deposit to the Registrar, Corvallis, Oregon.

Students who are planning to enter the School of Home Economics, or to live in one of the dormitories, are asked to write to the Registrar for special circulars giving more detailed information than will be found in the Catalogue.

The dormitories will be open for students September 17, 1914.

Students who wish to arrive in Corvallis previous to the opening day should make arrangements to board and lodge in town until the morning of that date, when the dormitories will be opened to receive them.

PRIVATE BOARD FOR MEN STUDENTS. No dormitory accommodations are available for men students. Board and room may be secured in private families in the city of Corvallis for from \$4.00 to \$5.50 per week. Good accommodations for self-boardings, or for club-boardings, can also be secured in the city. By clubbing, or renting rooms and boarding themselves, students materially reduce the cost of living. Students, however, will not be permitted to live at places not approved by the Faculty.

Lists of private boarding places can be secured from the Secretary of the Y. M. C. A. after the student arrives at the College.

PERSONAL EXPENSES

The personal expenses of students vary. Many students are able to go through the college year on a comparatively small income.

Each male student, immediately upon registration, is required to supply himself with a military uniform, the cost of which will be approximately as follows: Suit and cap, \$11; leggins, 90c; hat band and breast cord, \$1.15; collar ornaments, 25c; gloves, 40c per pair; total, \$13.70. Tan shoes (the regulation style, costing \$3.75) and a drab shirt (costing \$2.00) are appropriate elements of the uniform. The uniform is very serviceable and is more economical than civilian clothing; with reasonable care, it should serve for two or more years.

In physical education women are required to provide themselves with a gymnasium suit, consisting of blouse-waist and bloomers of regulation style, and with regulation gymnasium shoes. Good second-hand uniforms of outgoing girls will be on sale for about \$4.00, while new uniforms cost \$5.00. These suits should be ordered at the gymnasium office at the time of registration.

Male students are expected to supply themselves with a gymnasium suit and the regulation gymnasium shoes. The cost of the gymnasium uniform complete, including shoes, need not exceed \$2.75.

COST OF A YEAR IN COLLEGE

One of the most perplexing questions that confronts a prospective student is what the course is going to cost him a year. The necessary cost of a year at the College will vary slightly with the particular course pursued by the student. In general, it may be said that the legitimate cost per year averages about \$224. An estimate of the average cost per year for the main expense items is given below. The cost for room and board is estimated at a safe average price. The board and room items are sometimes slightly reduced, where two students occupy the same room or where boarding clubs are economically managed.

Registration fee.....	\$ 5.00
Incidental (Student) fee.....	5.00
Laboratory fees and deposits.....	18.00
Textbooks and supplies	26.00
Board (for eight months).....	*120.00
Room rent (nine months).....	30.00

*On account of Christmas and other vacations which most students spend at home, the cost for board is estimated for eight months only.

In addition to the above, would be the cost to men of the military uniform and the regulation gymnasium suit, and to women of the gymnasium suit and shoes. Uniforms, however, as already indicated, should serve for more than one year. Personal expenses such as clothing, car fare, laundry, etc., vary greatly with the individual.

It is not recommended that any student come to the College without sufficient funds available to purchase his books and college stationery for the entire semester, pay his first month's board and room rent in advance, and pay his first semester entrance fees. For the average student, this initial outlay will be approximately \$70.00, the balance of the annual expenses being distributed about evenly throughout the remaining months of the school year.

SELF-SUPPORT

A considerable number of students manage, in one way or another, to earn the whole or a part of their expenses while attending the College. Such opportunities occur in the line of office and laboratory assistance, personal services of numerous kinds, the management of various student enterprises, agencies for laundries, etc.

The Student Employment Bureau (in charge of the Christian Associations) registers without charge all students who apply for employment after they arrive at the College, and supplies employers with student labor as demanded. In general, the demand and supply are nearly equal, but the attention of new students who intend to earn the whole or part of their living is called to the following results of past experience:

1. There is a constant *over-supply* of those wishing to do teaching and clerical work. None but those having superior qualifications and experience are likely to secure employment the first semester.

2. There is a considerable demand for efficient stenographers; also for men and especially women students who can do domestic labor of any kind; board and room rent may be earned by table service, dish washing, general housework, house cleaning, gardening, etc.

3. Students who can do any kind of domestic or manual labor well, and who have thoroughly good health, can earn their board by three hours' work per day, or board and room by four hours' work per day. *But no student should come to the College without resources sufficient for the expenses of one semester.* (See "Personal Expenses.")

4. No student should come expecting to earn money, who can do nothing well; skill is essential, as competition is quite as severe in the College community as elsewhere.

5. Opportunities for earning money during the summer vacations can usually be counted on, the demand for forest rangers, for field workers in engineering and mining, for skilled workmen in engineering shops, factories, canneries, and hop-yards, and for horticultural, farm, and forestry laborers being most constant.

Upon arrival at the College, new students should report for information to the Information Bureau of the Christian Associations.

STUDENT LOAN FUND

Through the liberality of friends of the Oregon Agricultural College, an irreducible student loan fund aggregating \$3,750.61, (June, 1914), has been established. The purpose, as expressed by one of the donors, is "not to induce students to attend school by providing money that can be easily obtained, but rather to aid those who have determined to secure an education and are paying the cost wholly or in part from their own earnings."

The fund consists of the following contributions:

1. One thousand dollars (\$1,000) from Hon. R. A. Booth of Eugene, restricted to students studying:

(a) Agriculture in its various phases, with a view to becoming producers from the soil.

(b) Such branches of mechanics as properly relate to agriculture.

(c) Home Economics.

2. Five hundred dollars (\$500) known as the Ashby Pierce Student Loan Fund.

3. Two thousand two hundred and fifty dollars and sixty-one cents (\$2,250.61), without restriction, from various College organizations, such as Folk Club, Philadelphian and Feronian Literary

societies, the Barometer, the Oregon Countryman, the Cosmopolitan Club, the Faculty, the Christian Associations, the Winter Short Course students of 1914, Chapter A. of P. E. O., Portland, and by various individuals including Mrs. Clara H. Waldo, Portland, and Hon. Thomas Kay, Salem.

PRIZE FUND

The Clara H. Waldo Prize of one hundred dollars is an award annually made in the proportions of forty, thirty, twenty, and ten dollars respectively, to the woman of highest standing registered as a regular student in one of the degree courses in the senior, junior, sophomore, and freshman year. In the distribution of the prizes, the committee is guided by the following points:

- (a) Proficiency in literary and scholastic attainments.
- (b) Success in student activities.
- (c) Qualities of womanhood.
- (d) Qualities of leadership.

ADMISSION TO THE COLLEGE

A student who wishes to be admitted to the Oregon Agricultural College may do so in one of two ways: (1) By examination, (2) by certificate.

Students who seek admission by examination must present themselves for examination at the College on registration days, September 18, 19, 20.

Students who seek admission by certificate may do so in one of the following ways:

FOR ADMISSION TO THE VOCATIONAL COURSES—By presenting properly certified evidence of the completion of the eighth grade course of study in the public schools, and by meeting the other requirements for admission specified in the paragraph on *Vocational Courses*, under *Entrance Requirements*.

FOR ADMISSION TO THE DEGREE COURSES—By presenting (for the year 1914-1915) properly certified evidence of the completion of three years of the course of study (12 units) in an accredited or standard high school, and by meeting the other requirements for admission specified in the paragraph on *Degree Courses*, under *Entrance Requirements*.

FOR ADMISSION AS A SPECIAL STUDENT—By presenting properly certified evidence of suitable preparation for the studies desired, and by meeting the other requirements specified under *Special Students*.

FOR ADMISSION AS AN OPTIONAL STUDENT—By presenting properly certified evidence of meeting all the regular entrance requirements, and by meeting the other requirements specified under *Optional Students*.

FOR ADMISSION TO ADVANCED STANDING—By presenting properly certified evidence of the completion, in other institutions of recognized standing, of such work as is equivalent to corresponding work required in the College courses, and by meeting the other requirements specified under *Advanced Standing*.

FOR ADMISSION TO GRADUATE STUDY—By presenting properly certified evidence of graduation from this or other educational institutions of equal rank, and by meeting the other requirements for admission specified under *Graduate Study*.

ENTRANCE REQUIREMENTS

VOCATIONAL COURSES

For admission to the vocational courses in Agriculture, Dairying, Forestry, Home Economics, and Commerce, applicants must be at least 18 years of age, and in addition to having completed the eighth grade course of study, must be of good moral character. For admission to the vocational course in Mechanic Arts, applicants must be at least 16 years of age, and in addition to having completed the eighth grade course of study, must be of good moral character. Applicants who have not completed the eighth grade course of study, but who are 21 years of age or over, and of good moral character, may be admitted to any of the vocational courses at the discretion of the dean of the school in which the work is to be carried on. For a statement of the length and character of the vocational courses, see *Courses of Study*.

DEGREE COURSES

Applicants for admission to the degree courses must be 16 years of age or over and of good moral character. In 1914-15 they will be required to present twelve units of entrance credits (three years) in a standard high school, and in 1915-16 fifteen units (four years) in a standard high school. The twelve units required for 1914-15, and the fifteen units required for 1915-16, distributed in the most advantageous way for admission to the various College courses in Agriculture, Home Economics, Forestry, Engineering, Commerce, and Pharmacy, are indicated in the table entitled "Prescribed Units for Admission." If the distribution of units presented by the matriculate does not correspond to that recommended, as indicated by the table, the student will be required to carry in College the courses lacking in his secondary credits, in order to make up his deficiency.

PRESCRIBED UNITS FOR ADMISSION	Agriculture		Home Economics		For. & Log. Engin'g		Engineering		Commerce		Pharmacy	
	14-15	15-16	14-15	15-16	14-15	15-16	14-15	15-16	14-15	15-16	14-15	15-16
English	3	3	3	3	3	3	3	3	3	3	3	3
Mathematics—												
Algebra	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½
Plane Geometry	1	1	1	1	1	1	1	1	1	1	1	1
Solid Geometry	0	0	0	0	0	0	½	½	0	0	0	0
Physics	0	0	0	0	0	0	0	1	0	0	0	0
Bookkeeping	0	0	0	0	0	0	0	0	1	0	0	0
Electives	6½	9½	6½	9½	6½	9½	6	8	6½	8½	6½	9½
Total units	12	15	12	15	12	15	12	15	12	15	12	15

A unit, as referred to in the table, implies one high school subject carried for five 45-minute periods a week throughout the school year.

The electives listed in the table may be selected from any of the subjects, except Music, offered in the "Oregon Course of Study" for high schools.

While History and Foreign Languages are not prescribed by the College as entrance requirements, students are urged to pursue these subjects in the high school. For credit involved in this work, see *Advanced Standing*.

To be admitted as an unconditioned freshman during the school year 1914-15, a student must not lack more than one and one-half of the total units listed above. To be admitted as an unconditioned freshman in 1915-16, a student must not lack more than two of the total number of entrance units listed for that year. All entrance conditions must be removed during the freshman year.

ENTRANCE REQUIREMENTS FOR ADMISSION TO THE FRESHMAN YEAR

IN ENGLISH

INTERPRETATION AND VALUE OF THE THREE UNITS

Unit 1 will be interpreted as signifying the candidate's ability to express himself in writing in a manner at once clear and accurate; as possessing the power to distinguish in a broad sense literary values; i. e., the qualities that stamp a work as being literature.

Unit 2 should signify that the candidate is proficient in spelling, punctuation, grammar, sentence structure, and the formation of the paragraph; and that his style is plain and natural.

Unit 3 should signify some acquaintance on the part of the candidate with recognized literature, in particular the books adopted by the National Conference on Uniform Entrance Requirements. Greater emphasis is placed on his power of intelligent appreciation than on his knowledge of specific books.

IN MATHEMATICS

The entrance requirements in Mathematics; namely, one and one-half units in Algebra and one unit in Plane Geometry, will be satisfied by the applicant's ability to pass a satisfactory examination in the following topics: addition, subtraction, multiplication, and division of positive and negative numbers; use of parentheses, factoring, highest common factor, lowest common multiple, fractions, fractional and literal equations, simultaneous equations, prob-

lems involving linear equations with one or more unknown numbers, graphical representation of simultaneous linear and quadratic equations, involution, evolution, theory of exponents, radical expressions, imaginary numbers, quadratic equations, problems involving quadratic equations with one unknown number, equations in the quadratic form, factoring of quadratic equations, solution of quadratic equations by factoring, simultaneous quadratic equations, problems involving simultaneous quadratic equations with two unknown numbers.

The requirements in Plane Geometry are the five books of Wentworth's Plane Geometry, or any other standard text on the subject. That the student may be trained to think for himself and not be dependent upon the published proofs of the text, much importance is placed upon the proving of original exercises. It is distinctly advised that students preparing for entrance examination in Geometry devote considerable time to the study of original exercises.

IN PHYSICS

The "one unit" entrance requirement in Physics for the year 1915-16 will be satisfied by one school year's work in physics, using the State text, Millikan and Gale, or any other of the standard high school texts. The class should meet five times a week, each period being at least 45 minutes in length. At least one period each week should be devoted to laboratory work. In order to concentrate the attention upon the fundamental principles, rather than upon manipulation and computation, it is well frequently to make the experiments qualitative rather than quantitative in nature. A neat report should be required upon every experiment; each report should include: (1) a concise statement of the *object* of the experiment; (2) a brief description of the *apparatus* and the *method*; and (3) *data* and *results*, tabulated whenever possible. These reports should be criticised by the teacher, and the student should be compelled to correct not only mistakes in physics, but also mistakes in grammar, rhetoric, and spelling, as it is certainly true that a correct form of expression is just as important to the student as correct ideas; clear expression and clear ideas go hand in hand.

IN BOOKKEEPING

The entrance requirements in bookkeeping for the year 1915-16 are the elements of double entry. The applicant must be familiar with the principles of debit and credit, the usual forms of entries, the standard books of entry, and of trial balances, balance sheets, and statements. He must be able to write a good, plain business hand, and be able to handle figures readily and accurately. Candidates who are deficient in these requirements must register conditioned in the subject, and remove the condition during the freshman year.

ACCREDITED SCHOOLS

Pending the preparation of a classified list of high schools by the Oregon State Department of Public Instruction, students who have completed the work of the tenth, eleventh, and twelfth grades of the Oregon high school course of study, or its equivalent, will be admitted to the degree courses on presentation of the diploma or a signed statement of the principal showing work completed. It is recommended that the Certificate of Record blank issued by the Oregon Agricultural College, be used. Copies will be sent by the Registrar on the application of either student or principal. These blanks must be filled out and signed by the principal or other authorized official of the school. The certificate, so authenticated, should be filed with the Registrar of the College on or before September 12, 1914. Acknowledgement of the receipt of such certificates will be made by the Registrar up to and including September 12.

SPECIAL STUDENTS

Students who have presented satisfactory evidence of suitable preparation for the studies they desire, who are 18 years of age and of good moral character, may be admitted as special students, provided they have neither already been admitted to the College, nor, having applied for admission, been rejected.

Special students may be allowed to graduate in any of the courses, on condition that they complete the required work and pass the necessary examinations.

Special students are expected to select their studies from courses open to freshmen. If they desire to take studies to which only advanced students are regularly admitted, they must show special preparation or special necessity for such courses.

Candidates applying for admission on the above basis should file with the Registrar before September 12, 1914, a detailed statement of their preparatory work.

OPTIONAL STUDENTS

Students who have presented satisfactory evidence of meeting all the entrance requirements for the freshman class, who are of mature years and of good moral character, may be admitted as optional students, provided they furnish satisfactory evidence that they are unable, because of poor health, or outside business, or professional duties, to take a full course. They should file with the Registrar, before September 12, 1914, a certified statement of all preparatory work.

ADVANCED STANDING

Students matriculating in the degree courses with more than the number of credits required for entrance to the freshman class, will be given advanced standing for any surplus credits, in so far as such credits may be equivalent to the requirements of the course in which the student matriculates.

No credit will be allowed either for any Science carried for less than one full year, or for any Foreign Language carried for less than two full years.

Students from accredited high schools presenting credits in one or more years of History, or two years of Foreign Languages, will be permitted to substitute such work for the History and Foreign Languages required in course.

ADMISSION FROM OTHER COLLEGES

Any student who has attended another college or university and desires to enter the Oregon Agricultural College, should file with the Registrar, on or before September 12, 1914, an official certificate from the college from which he wishes to transfer, giving evidence of: (1) his honorable dismissal; (2) a detailed

statement of the entrance credits presented at the time of his matriculation at the other college; (3) a detailed statement of the work pursued while in attendance at that college; and (4) a marked copy of the catalogue of the institution, showing by conspicuous markings the courses which he completed.

REGISTRATION

All candidates for admission should file with the Registrar a certificate of their preparatory record on or before September 12, 1914. Blank forms for such record may be secured from the Registrar. Such candidates should present themselves for registration at the College on September 18, 19, or 21, 1914. Registration at a later date will be permitted only on presentation of a satisfactory reason for the delay. Students in all courses register at the beginning of the collegiate year for the work of the entire year. Credit for work not so registered, and changes in registration, will be allowed only by special permission of the College Council.

Students who have not before registered at the College are advised to reach Corvallis not later than September 17, 1914, in order that they may secure a boarding and rooming place before the first day of registration.

GRADUATION

The degree of Bachelor of Science in Agriculture, in Forestry, in Logging Engineering, in Home Economics, in Civil Engineering, in Electrical Engineering, in Irrigation Engineering, in Highway Engineering, in Mechanical Engineering, in Mining Engineering, in Ceramics, in Chemical Engineering, in Commerce, in Pharmacy, and in Industrial Arts, are conferred upon those who have satisfactorily completed the respective four-year courses which in the aggregate comprise 136 credits of College work. A graduate in any of the courses may receive the bachelor's degree in any other course by completing the studies required in that course.

GRADUATE STUDY

The Oregon Agricultural College offers to its graduates and to those of other institutions of equal rank, work in Agriculture,

Home Economics, and Pharmacy leading to the degree of Master of Science, and work in Engineering, Mining, and Forestry, leading to the usual professional degrees.

This work is done in the several departments of the College under the general supervision of a standing committee of the Faculty known as the committee on "Graduate Students and Advanced Degrees."

REQUIREMENTS FOR THE HIGHER DEGREES

Candidates for any one of the higher degrees will be required to complete a certain minimum of resident work, to prepare a suitable thesis, and to pass an oral examination.

The resident work is planned so that it may be completed in a single year by a student who devotes full time to his studies; it consists of a minimum of 32 credits, including the preparation of the thesis. One credit requires approximately three hours of the student's time per week for one semester. From 16 to 24 of these credits will be devoted to the thesis and to allied subjects in the same department, and will constitute the candidate's major. From 8 to 16 of these 32 credits will be selected from other departments of the College and will constitute the minor. Undergraduate work may, at the discretion of the committee, be taken as part of the minor, but when so taken, the number of credits allowed for any course will be reduced to two-thirds of the number listed in the catalogue, the assumption being that the candidate can, in work of that grade, accomplish as much in two hours as the average undergraduate in three. Upon the suggestion of the professor in charge of the major, and at the option of the committee, a graduate student may be given additional work in an undergraduate course and granted credit accordingly. All graduate students taking regularly announced courses must attend the examinations given as part of such courses.

The thesis must embody the results of investigative, though not necessarily original research, and a typewritten copy of the thesis, prepared according to the specifications of the committee, must be deposited with the chairman of the committee not later than May 15 of the year in which the degree is desired.

After the thesis has been deposited, the chairman will appoint a special examining committee and set a date for the oral examina-

ation. This special committee will consist of: (1) the one or more professors in charge of the major; (2) the one or more professors in charge of the minor; and (3) one or more members of the Committee on Graduate Students and Advanced Degrees. The report of this committee will be presented to the College Council by the chairman of the Committee on Graduate Students and Advanced Degrees. The chairman will deposit the theses of successful students with the Librarian as soon as possible after the oral examination.

Higher degrees will be conferred only at the regular commencement exercises, but the committee may under exceptional circumstances allow the candidate to be absent from such exercises.

ADMISSION TO THE COLLEGE AS A GRADUATE STUDENT

All students who have been graduated from four-year courses in the Oregon Agricultural College or in other colleges of equal rank, will be considered graduate students and will be registered as such by the Registrar. Graduate students will present their registration certificates to the chairman of the Committee on Graduate Students and Advanced Degrees, and will receive from him detailed instructions regarding the completion of their registration.

FEEES

Graduate students will pay the same entrance, incidental, diploma, and binding fees as undergraduates. Laboratory fees will in each case be determined by the head of the department concerned, and must be paid at the beginning of the year in which the laboratory work is done.

COURSES OF STUDY

The Oregon Agricultural College offers the following courses of study, each of which extends over four years and leads to the degree of Bachelor of Science:

In the *School of Agriculture*, major courses in—

- | | |
|--------------------------|---------------------------------|
| (a) General Agriculture. | (g) Agricultural Chemistry. |
| (b) Agronomy. | (h) Agricultural Bacteriology. |
| (c) Animal Husbandry. | (i) Botany and Plant Pathology. |
| (d) Dairy Husbandry. | (j) Economic Zoology. |
| (e) Horticulture. | (k) Economic Entomology. |
| (f) Poultry Husbandry. | |

In the *School of Forestry*, major courses in—

- | | |
|-----------------------|--------------------------|
| (a) General Forestry. | (b) Logging Engineering. |
|-----------------------|--------------------------|

In the *School of Home Economics*, major courses in—

- | | |
|-----------------------|-------------------------------|
| (a) Domestic Science. | (c) Home Administration. |
| (b) Domestic Art. | (d) Institutional Management. |

In the *School of Engineering*, major courses in—

- | | |
|-----------------------------|-----------------------------|
| (a) Civil Engineering.* | (d) Highway Engineering. |
| (b) Electrical Engineering. | (e) Irrigation Engineering. |
| (c) Mechanical Engineering. | (f) Industrial Arts. |

In the *School of Mines*, major courses in—

- | | |
|-------------------------|---------------------------|
| (a) Mining Engineering. | (c) Chemical Engineering. |
| (b) Ceramics. | |

In the *School of Commerce*, a major course in—

- (a) Commerce.

In the department of *Pharmacy*, a course in—

- (a) Pharmacy.

In addition to the above baccalaureate courses, provision has been made for the following vocational courses:

- A. Agriculture (one year).
- B. Dairying (one year).
- C. Home Makers' Course (one year).
- D. Mechanic Arts (three years).
- E. Forestry (November 2 to April 16).
- F. Business Short Course (two years).

*No work below Sophomore grade will be given in Civil Engineering during the year 1914-15.

SCHOOL OF AGRICULTURE

The School of Agriculture offers the following courses of study: a one-year course in General Agriculture; a one-year course in Dairying; a three-months winter course in Dairying; a four-weeks winter course in Agronomy, Animal Husbandry, Horticulture, and Poultry Husbandry (known as the Winter Short Course); and eleven four-year courses, each of which leads to the degree of Bachelor of Science.

VOCATIONAL COURSES. The one-year courses are provided especially for those who have had no opportunity to pursue their public school courses beyond the eighth grade, or who, from necessity or choice, desire, upon completing the work of this grade, to obtain as quickly as possible a working knowledge of the principles of agricultural practice. They are also open to students with one or more years of high school preparation, and to men of mature years and practical experience, who may desire to familiarize themselves with the most modern thought on this subject. Those who pursue the one-year course in Agriculture will have the opportunity of specializing in general farm practice, live stock husbandry, horticulture, or poultry husbandry; and those who pursue the one-year course in Dairying will have the opportunity of specializing in Dairy Production or Dairy Manufacturing.

In this State there are thousands of young men who are to become future farmers and orchardists. It is to the interest both of the individual and of the State that these young men should keep pace with the rapid development of agriculture. Each and every one should have, if possible, the opportunity of obtaining an agricultural education. Many of these young men are so situated, however, that it is impossible for them to attend any of our regular four-year courses. There are also many mature men well past the usual school age, no doubt, who desire to acquaint themselves more fully with the more recent developments in agricultural science and practice. It is to meet the needs of such men, both young and old, that these one-year courses are offered. They are designed to provide the largest amount of practical information and training that can be given in one year.

THE DEGREE COURSES. The various degree courses in Agriculture are open only to those who have completed the equivalent of

at least three years of the Oregon State high school course (see *Admission to the College*). The aim of these courses is to train young men to become successful farmers, stockmen, and fruit growers; to equip them to become efficient managers of orchard and ranch properties and of agricultural cooperative organizations; to prepare them to become specialists in some branch of agricultural college or experiment station work, or to fit them to become teachers of agriculture in the public schools. In short, they offer to those who have faith in the farm and in rural life, opportunities for individual development and technical training equal to those provided for the educated in other professions.

The various subjects of instruction may be conveniently arranged into three groups, as follows:

(a) Sciences related to Agriculture; *i. e.*, Botany, Zoology, and Entomology; Chemistry, Physics, and Bacteriology; (b) Technical Agricultural subjects; *i. e.*, Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, Poultry Husbandry, and Veterinary Medicine; (c) non-technical subjects; *i. e.*, English Language and Literature, Modern Languages, Political Science, Rural Economy, Rural Sociology, and similar subjects.

The subjects of the first group are designed to furnish the student with an insight into the principles of agricultural science. Those of the second group teach him the application of these principles and give him also, both theoretically and practically, various subjects of agricultural technology. The subjects of the third group tend further to develop the student's intellect, broaden his view, and train him in good citizenship.

To indicate briefly the nature of the work, it may be stated that in the courses in Agronomy, the student studies the origin, structure, fertility, cultivation, and improvement of various soils; the history, growth, culture, improvement, and value of the different field crops; the structures, machinery, drainage, and irrigation of the farm; and the history, economics, methods, and business principles in farm management. Thorough courses in Business Administration, Rural Economy, and Sociology, and Political Science for Agricultural students are given by the School of Commerce. In the course in Animal Husbandry, consideration is given to the history and characteristics of the various breeds of livestock; the principles of breeding; the principles and practice of feeding, with

particular reference to conditions in this State. By constant practice in stock judging, the student is made familiar with the good points of the various breeds. In Horticulture the student studies the problems of the orchard and garden, such as choice of sites, soils, planting, pruning, choice of varieties, sprays and spraying, and thinning; he obtains instruction and practice in the propagation of plants by various methods; in the harvesting, packing, storage, and marketing of fruits; he may study the principles of plant breeding, or the construction and management of greenhouses, or the culture of small fruits and vegetables for market or canning purposes. In Dairy Husbandry he studies the secretion, composition, and separation of milk and cream; and obtains abundant practice in the use of the Babcock and other tests, in butter and cheese making, and in creamery practice. A department of Poultry Husbandry offers to students exceptional opportunities to specialize in this line. The instruction will include a study of breeds, the principles of feeding, housing, and incubation, and will be supplemented by practical work on the farm. In Veterinary Medicine the student is taught to prevent disease, diagnose existing pathological conditions, arrest outbreaks of contagious and infectious diseases among domestic animals, give medical attention in emergency cases, and take care of the sick.

In response to the demand for special teachers of Agriculture in the high schools, an opportunity is given students to major in agricultural education. Certain courses are prescribed in the junior and senior years to broaden the general agricultural training of the first two years, so that the teacher may be prepared to meet the conditions in any section of the State. Courses in Pedagogy provide the necessary principles and methods of teaching. Some election is also allowed in order that the student may specialize along the lines of his greatest interest.

The degree courses in Agriculture can be conveniently arranged into a farm practice group, including the various courses in the departments of Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, and Poultry Husbandry, and Agriculture for Teachers; and an Agricultural science group, including the courses in the departments of Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology. As indicated in the following outlines, all can-

didates for the degree of Bachelor of Science in Agriculture will be required to pursue the prescribed studies of one of these groups during the first two years of the course, in order that each may become well grounded in the fundamentals of Agricultural science and practice. During the remaining two years of his course, each student will be given an opportunity to become proficient in some one branch of Agricultural practice, or of Agricultural science, by taking major work in one of the above mentioned subjects; or, if preferred, the student may elect to pursue a course in General Agriculture.

All students working for a degree will be required to carry at least seventeen credits through the junior year, and sixteen credits through the senior year. Subjects other than those prescribed in the following outlines must be selected with the advice of the head of the department in which the major is taken, except in the case of students who elect to pursue the course in General Agriculture. Minors may be selected from any of the above mentioned departments, or from the departments of English, Mathematics, Physics, Commerce, Industrial Pedagogy, Civil Engineering, Highway Engineering, Architecture, Modern Language, or Forestry.

One-Year Course in Agriculture

	Semester	
	1st	2nd
*Elementary Constructive English (Eng. A)	3	
*Composition (Eng. B)		3
Farm Accounting (Com. E)		3
Business and Social Organization (Com. I)	3	
Woodwork (Shop G)	2	
Blacksmithing (Shop L)		2
Soils (Agron. A)	3	
Farm Crops (Agron. B)		3
Agronomy (Optional)—		
Farm Machines and Engines (Agron. C)	3	
Farm Drainage (Agron. D)		2
Dry Farming Practice (Agron. E)	2	
Irrigation Farming Practice (Agron. F)		2
Animal Husbandry (Optional)—		
Stock Judging (A. H. A.)	2	
Feeding and Management (A. H. B.)		5
Elements of Stock Feeding (A. H. E.)	2	
Diseases of Domestic Animals (V. M. 15)	3	
Horticulture (Optional)—		
Horticultural Practice (Hort. A, B)	5	5
Poultry Husbandry (Optional)—		
Practical Poultry Keeping (P. H. A. B.)	5	5
**Drill (Military A, B)	1	1
**Gymnasium (Phys. Ed. 11, 12)	½	½

*Students who have a satisfactory knowledge of English may elect an equivalent amount of other work.

**Mature men may be excused from Military Drill and Gymnasium work.

One-Year Course in Dairying

	<i>Semester</i>	
	1st	2nd
*Elementary Constructive English (Eng. A)	3	
*Composition (Eng. B)		3
Dairy Accounting (Com. D)		3
Dairy Mechanics (Ind. Arts 230)		2
Testing Dairy Products (D. H. A)	2	
Dairy Bacteriology (Bact. 406)		2
Dairy Manufacturing (Optional)—		
Buttermaking and Factory Management (D. H. B)....	4	
Cheesemaking (D. H. C)		4
Ice Cream (D. H. D)		1
Judging Butter and Cheese (D. H. H, I).....	1	1
Dairy Practice (D. H. N, O)	1	1
Special Tests, Creamery Practice (D. H. E, F)	2	2
Dairy Production (Optional)—		
Diseases of Dairy Cattle (Vet. Med. 17, 18)	2	2
Farm Crops (Agron. B)		3
Judging Dairy Cattle (D. H. L, M)	1	1
Feeding, Breeding, and Managing Dairy Cattle (D. H. J, K)	2	2
Dairy Practice (D. H. N, O)	1	1
**Drill (Military, A, B)	1	1
**Gymnasium (Phys. Ed. 11, 12)	½	½

*Students who have a satisfactory knowledge of English may elect an equivalent amount of other work.

**Mature men may be excused from Military Drill and Gymnasium work.

DEGREE COURSES IN AGRICULTURE

	Semester	
	1st	2nd
FRESHMAN YEAR		
Modern English Prose (Eng. 81, 82)	3	3
General Chemistry (Chem. 100, 101)	3	3
General Physics (Phys. 1, 2)	3	3
Agricultural Botany (Bot. 41, 42)	3	3
Soils (Agron. 101)	3	
Crop Production (Agron. 201)		3
Stock Judging (A. H. 1)	2	
Woodwork (Shop 106)		1
Library Practice (Libr. 1)		$\frac{1}{2}$
Hygiene (Phys. Ed. 10)		$\frac{1}{2}$
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 18 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$
SOPHOMORE YEAR		
Farm Accts. & Business Methods (Com. 109)	2	
Principles of Economic Zoology (Zool. 108, 109)	3	3
Agricultural Chemistry (Chem. 500, 501)	3	3
Elementary Bacteriology (Bact. 101)	3	
Principles of Fruit Growing (Hort. 101)	3	
Vegetable Growing (Hort. 201)		2
Elements of Dairying (D. H. 1)		3
Live Stock Management (A. H. 2)		3
Farm Surveying and Leveling (C. E. 242)		2
Practical Poultry Keeping (P. H. 6)	2	
Blacksmithing (Shop 153)	1	
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 18 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

JUNIOR YEAR

Semester
1st. 2nd.

Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Major and Minor Electives	12	15
	—	—
	17	17

SENIOR YEAR

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Major and Minor Electives	13	13
	—	—
	16	16

RECOMMENDED COURSES

JUNIOR AND SENIOR OUTLINES. The following outlines are intended to indicate the courses which it is recommended that students pursue who wish to major in any particular subject, such as Field Crops, Dairy Manufacturing, Pomology, Poultry Husbandry, etc. While it is expected that students will adhere rather closely to these outlines, the courses may be altered to suit the needs of individual students on consultation with the head of the department in which the major is taken.

COURSES IN AGRONOMY

(a) General Agronomy

	<i>Semester</i>	
	1st.	2nd.
JUNIOR YEAR		
Agricultural Economics (Com. 219)	3	
Cereal Crops (Agron. 202)	4	
Field Machinery (Agron. 401)	2	
Land Drainage (Agron. 301)		3
Soil Physics (Agron. 102)		4
Farm Power Machinery (Agron. 402)		3
Junior Seminar (Agron. 503)		1
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	6	4
	—	—
	17	17
SENIOR YEAR		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Agrostology (Agron. 205)	4	
Soil Fertility (Agron. 104)	4	
Crop Improvement (Agron. 204)		3
Farm Management (Agron. 505)		3
Senior Seminar (Agron. 504)		1
Approved Electives	5	6
	—	—
	16	16

(b) Soils

JUNIOR YEAR	<i>Semester</i>	
	1st.	2nd.
Agricultural Economics (Com. 219)	3	
Forage Crops (Agron. 203)	2	
Cereal Crop Lectures (Agron. 202)	2	
Agricultural Bacteriology (Bact. 501, 502)	3	3
Land Drainage (Agron. 301)		3
Soil Chemistry (Chem. 503)	3	
Soil Physics (Agron. 102)		4
Junior Seminar (Agron. 503)		1
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	2	4
	—	—
	17	17

SENIOR YEAR

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Agricultural Geology (Min. 171)	3	
Soil Fertility (Agron. 104)	4	
Crop Improvement (Agron. 204)		3
Farm Management (Agron. 505)		3
Soil Surveying (Agron. 106)		2
Senior Seminar (Agron. 504)		1
Approved Electives	6	4
	—	—
	16	16

(c) Field Crops

	Semester	
	1st.	2nd.
JUNIOR YEAR		
Agricultural Economics (Com. 219)	3	
Agricultural Bacteriology (Bact. 501)	3	
Introductory Entomology (Ento. 301)	2	
Cereal Crops (Agron. 202)	4	
Land Drainage (Agron. 301)		3
Crop Improvement (Agron. 204)		3
Soil Physics (Agron. 102)		4
Junior Seminar (Agron. 503)		1
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	3	4
	—	—
	17	17
SENIOR YEAR		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Agrostology (Agron. 205)	4	
Soil Fertility (Agron. 104)	4	
Farm Management (Agron. 505)		3
Advanced Crop Work (Agron. 211)		2
Senior Seminar (Agron. 504)		1
Feeds and Feeding (A. H. 23)		3
Approved Electives	5	4
	—	—
	16	16

(d) Irrigation Farming		Semester	
JUNIOR YEAR		1st.	2nd.
Agricultural Economics (Com. 219)	3		
Irrigation Farming (Agron. 302)	3		
Climatology (Agron. 303)			1
Topographic Surveying (C. E. 243)	2		
Elementary Bacteriology (Bact. 101)	3		
Land Drainage (Agron. 301)			3
Elements of Dairying (D. H. 1)			3
Crop Improvement (Agron. 204)			3
Junior Seminar (Agron. 503)			1
Farm Power Machinery (Agron. 402)			3
Military Science (Theo. Inst. 1, 2)	1	1	
Drill (Military 5, 6)	1	1	
Approved Electives	4	1	
	17	17	
SENIOR YEAR			
National Government (Com. 320)	3		
State and Municipal Government (Com. 322)			3
Hydraulics (I. E. 101)	3		
Irrigation Institutions (Agron. 305)	2		
Soil Fertility (Agron. 104)	4		
Advanced Drainage and Irrigation Work (Agron. 311)	2		
Farm Management (Agron. 505)			3
Senior Seminar (Agron. 504)			1
Feeds and Feeding (A. H. 23)			3
Dairy Herd Management (D. H. 2) (Lectures only)			3
Approved Electives	2	3	
	16	16	

*In the sophomore year students electing Irrigation Farming are required to take Trigonometry (Math. 11, 3 credits, 1st semester), and Soil Physics (Agron. 102, 4 credits, 2nd semester), instead of Elementary Bacteriology (3 credits, 1st semester), and Elements of Dairying (3 credits, 2nd semester).

(e) Farm Management

	Semester	
	1st.	2nd.
JUNIOR YEAR		
Forage Crops (Agron. 203)	2	
Cereal Crops (Agron. 202) (Lectures only)	2	
Diseases of Live Stock (Vet. Med. 14)		3
Typewriting (Com. 410a)	1	
Commercial Law (Com. 306)	3	
Weed Eradication (Agron. 501)	1	
Practical Pomology (Hort. 102)	2	
Soil Physics (Agron. 102)		4
Farm Management (Agron. 505)		3
Farm Power Machinery (Agron. 402)		3
Junior Seminar (Agron. 503)		1
Land Drainage or Irrigation Farming (Agron. 311 or 302)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	1	1
	17	17

SENIOR YEAR

Soil Fertility Lecture (Agron. 104)	3	
Semi-Arid Crop Production (Agron. 207)		1
Introductory Entomology (Ento. 301)	2	
Principles of Plant Pathology (Bot. 101)	2	
Cooperative Accounting and Management (Com. 130)	3	
Economic Organization of Agriculture (Com. 264)	3	
Composition of Addresses (Eng. 103)	2	
Advanced Farm Management (Agron. 511)		3
Senior Seminar (Agron. 504)		1
Feeds and Feeding (A. H. 23)		3
Dairy Herd Management (D. H. 2) (Lectures only)		3
Rural Finance (Com. 265)		3
Soil Surveying (Agron. 106)		2
Approved Electives	1	0
	16	16

COURSE IN ANIMAL HUSBANDRY

	Semester	
	1st.	2nd.
JUNIOR YEAR		
Advanced Commercial Law (Com. 300, 301)	3	3
Agricultural Economics (Com. 219)	3	
Comparative Anatomy (Vet. Med. 1)	3	
Comparative Physiology (Vet. Med. 2)		3
Types and Breeds of Horses (A. H. 210)	2	
Types and Breeds of Cattle (A. H. 220)	2	
Types and Breeds of Sheep (A. H. 230)		2
Types and Breeds of Hogs (A. H. 240)		2
Soil Physics (Agron. 103)		3
Forage Crops (Agron. 203)	2	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Elective		2
	—	—
	17	17

SENIOR YEAR

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Diseases of Live Stock (Vet. Med. 3, 4)	3	3
Animal Chemistry (Chem. 509)	2	
Animal Nutrition (A. H. 7)	2	
Principles of Breeding (A. H. 6)		3
Feeds and Feeding (A. H. 21)		5
Advanced Stock Judging (A. H. 16)	3	
Livestock Practice (A. H. 101, 102)	1	1
Seminar (A. H. 18, 19)	1	1
Approved Elective	1	
	—	—
	16	16

COURSES IN DAIRY HUSBANDRY

(a) Dairy Production

	Semester	
	1st.	2nd.
JUNIOR YEAR		
Agricultural Economics (Com. 219)	3	
Forage Crops (Agron. 203)	2	
Animal Nutrition (A. H. 7)	2	
Genetics (Zool. 120)	3	
Comparative Anatomy (Vet. Med. 1)	3	
Dairy Chemistry (Chem. 502)		3
Comparative Physiology (Vet. Med. 2)		3
Herd Management and Milk Production (D. H. 2)		5
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Electives	2	4
	17	17

SENIOR YEAR

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Dairy Bacteriology (Bact. 401)	3	
Breeds and Breeding of Dairy Cattle (D. H. 5)	3	
Diseases of Live Stock (Vet. Med. 3, 4)	3	3
Dairy Inspection and Dairy Farm Equipment (D. H. 6) ..	3	
Dairy Mechanics (Ind. Arts 230)		2
Buttermaking and Factory Management (D. H. 3)		5
Seminar (D. H. 8)		1
Advanced Judging (D. H. 10)	1	
Approved Elective		2
	16	16

(b) Dairy Manufacturing

	Semester	
	1st.	2nd.
JUNIOR YEAR		
Agricultural Economics (Com. 219)	3	
Forage Crops (Agron. 203)	2	
Animal Nutrition (A. H. 7)	2	
Business Organization and Management (Com. 110)	3	
Genetics (Zool. 120)	3	
Dairy Chemistry (Chem. 502)		3
Buttermaking and Factory Management (D. H. 3)		5
Milk Production and Herd Management (D. H. 2)		5
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	2	2
	—	—
	17	17
SENIOR YEAR		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Cheesemaking (D. H. 4)	4	
Dairy Bacteriology (Bact. 401)	3	
Breeds and Breeding of Dairy Cattle (D. H. 5)	3	
Dairy Inspection and Dairy Farm Equipment (D. H. 6) ..	3	
Ice cream and Ices (D. H. 7)		2
Dairy Mechanics (Ind. Arts 230)		2
Seminar (D. H. 8)		1
Butter and Cheese Judging (D. H. 9)		1
Electives		7
	—	—
	16	16

COURSES IN HORTICULTURE

(a) Pomology

	Semester	
	1st.	2nd.
JUNIOR YEAR		
Agricultural Economics (Com. 219)	3	
Floriculture (Hort. 401)	2	
Landscape Gardening (Hort. 301)		2
Plant Propagation (Hort. 105)		2
Practical Pomology (Hort. 102)	2	
Orchard Practice (Hort. 103, 104)	2	2
Plant Physiology (Bot. 50)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	6	6
	—	—
	17	17

SENIOR YEAR

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Systematic Pomology (Hort. 115)	4	
Commercial Pomology (Hort. 117)		2
Introductory Entomology (Ento. 301)	2	
Entomology of Orchard and Small Fruits (Ento. 302)....		2
History and Literature of Horticulture (Hort. 125).....		2
Seminar (Hort. 123, 124)	1	1
Principles of Plant Pathology (Bot. 101)	2	
Diseases of Orchards and Small Fruits (Bot. 102)		2
Approved Electives	5	5
	—	—
	17	17

(b) Olericulture

JUNIOR YEAR	<i>Semester</i>	
	1st.	2nd.
Agricultural Economics (Com. 219)	3	
Plant Propagation (Hort. 105)		2
Practical Vegetable Gardening (Hort. 203, 204)	2	3
Plant Breeding (Hort. 127)	3	
Floriculture (Hort. 401)	2	
Landscape Gardening (Hort. 301)		2
Introductory Entomology (Ento. 301)	2	
Entomology of Truck and Field Crops (Ento. 303)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	3	5
	—	—
	17	17

SENIOR YEAR

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Commercial Truck Gardening (Hort. 209, 210)	3	3
Forcing Vegetables (Hort. 205, 206)	2	2
Systematic Olericulture (Hort. 207)	1	
Seminar (Hort. 123, 124)	1	1
Principles of Plant Pathology (Bot. 101)	2	
Diseases of Vegetable Crops (Bot. 104)		2
Approved Electives	4	5
	—	—
	16	16

(c) Floriculture

	Semester	
	1st.	2nd.
JUNIOR YEAR		
Agricultural Economics (Com. 219)	3	
Floriculture (Hort. 401)	2	
Landscape Gardening (Hort. 301)		2
Plant Materials (Hort. 305, 306)	3	3
Greenhouse Construction (Hort. 403)		3
Introductory Entomology (Ento. 301)	2	
Entomology of Truck and Field Crops (Ento. 303)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	4	4
	—	—
	17	17
SENIOR YEAR		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Forcing Flowers (Hort. 405, 406)	3	3
Agricultural Bacteriology (Bact. 501)	3	
Forcing Vegetables (Hort. 205, 206)	2	2
Advanced Plant Breeding (Hort. 127, 128)	3	3
Diseases of Vegetable Crops (Bot. 104)		2
Approved Electives	2	3
	—	—
	16	16

(d) Landscape Gardening*

	Semester	
	1st.	2nd.
FRESHMAN YEAR		
Modern English Prose (Eng. 81, 82)	3	3
Plane Surveying (C. E. 222)		5
Modern Language (French, German or Spanish, first Yr.)	3	3
Library Practice (Libr. 1)		$\frac{1}{2}$
Hygiene (Phys. Ed. 10)		$\frac{1}{2}$
Agricultural Botany (Bot. 41, 42)	3	3
Trigonometry (Math. 11)	3	
Architectural Drawing (Arch. 501)	3	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Approved Elective	1	1
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
SOPHOMORE YEAR		
American Literature (Eng. 71, 72)	3	3
Modern Language (French, German or Spanish, second Yr.)	3	3
Topographical Surveying (C. E. 223)	5	
Railroad and Canal Surveying (C. E. 272)		5
Principles of Fruit Growing (Hort. 101)	3	
Landscape Gardening (Hort. 301)		2
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
Approved Electives	3	4
	<hr/> 18 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$

*Since freshman and sophomore outlines in Landscape Gardening differ from the corresponding outlines in the standard course in Agriculture, these outlines are included here with those for the junior and senior years.

	JUNIOR YEAR	Semester	
		1st.	2nd.
Agricultural Economics (Com. 219)		3	
Composition of Addresses (Eng. 103, 104)		2	2
Water Color Rendering (Arch. 505, 506)		2	2
Floriculture (Hort. 401)		2	
Plant Materials (Hort. 305, 306)		3	3
Hist. and Lit. of Landscape Architecture (Hort. 311) ..			2
Drill (Military 5, 6)		1	1
Military Science (Theo. Inst. 1, 2)		1	1
Approved Electives		3	6
		<hr/> 17	<hr/> 17
SENIOR YEAR			
National Government (Com. 320)		3	
Constitutional Law and Politics (Com. 322)			3
Theory and Design (Hort. 307, 308)		2	3
Town Planning (Hort. 313)		3	
Field Practice (Hort. 309, 310)		3	3
Approved Electives		5	7
		<hr/> 16	<hr/> 16

COURSES IN POULTRY HUSBANDRY

	<i>Semester</i>	
	1st.	2nd.
JUNIOR YEAR		
Agricultural Economics (Com. 219)	3	
Poultry Husbandry (Poultry Hus. 1, 2)	4	4
Embryology and Histology (Zool. 104, 105).....	3	3
Markets and Marketing (Poultry Hus. 7)	2	
Feeds and Feeding (Poultry Hus. 10)		2
Anatomy of the Fowl (Vet. Med. 11)	2	
Poultry Disease Bacteriology (Bact. 701)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	1	4
	—	—
	17	17
SENIOR YEAR		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Advanced Poultry Husbandry (Poultry Hus. 3, 4).....	4	6
Principles of Breeding (Animal Hus. 6).....		3
Farm Management (Agronomy 505)		3
Approved Electives	9	1
	—	—
	16	16

OTHER COURSES

In the courses of this group, which for convenience has been designated the agricultural science group as distinguished from the farm practice group already outlined, students are allowed to major in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology. The purpose of the courses is to train students for agricultural college and experiment station positions in these various sciences; for work in the scientific bureaus of the U. S. Department of Agriculture; for positions as fruit inspectors; and for technical positions in State and government fish and game propagation work.

	Semester	
	1st.	2nd.
FRESHMAN YEAR		
Modern English Prose (Eng. 81, 82)	3	2
Modern Language (German or French first year).....	3	3
Principles of Economic Zoology (Zool. 108, 109)	3	3
General Physics (Phys. 1, 2)	3	3
General Chemistry (Chem. 100, 101)	3	3
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Library practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Drill (Military 1, 2)	1	1
	<hr/>	<hr/>
	18 $\frac{1}{2}$	17 $\frac{1}{2}$
SOPHOMORE YEAR		
Modern Language (German or French, second year)..	3	3
Agricultural Botany (Bot. 41, 42)	3	3
Agricultural Chemistry (500, 501).....	3	3
Soils (Agron. 101).....	3	
Crop Production (Agron. 201)		3
Elementary Bacteriology (Bact. 101)	3	
Organic Chemistry (Chem. 201)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	16 $\frac{1}{2}$	16 $\frac{1}{2}$

	JUNIOR YEAR	Semester	
		1st.	2nd.
Agricultural Economics (Com. 219)	3		
Drill (Military 5, 6)	1		1
Military Science (Theo. Inst. 1, 2)	1		1
Major and Minor Electives	12		15
		<hr/>	<hr/>
		17	17
SENIOR YEAR			
National Government (Com. 320)	3		
State and Municipal Government (Com. 322)			3
*Major and Minor Electives	13		13
		<hr/>	<hr/>
		16	16

COURSE IN AGRICULTURE FOR TEACHERS

	JUNIOR YEAR	Semester	
		1st.	2nd.
Agricultural Economics (Com. 219)	3		
General Psychology (Ind. Ped. 101)	3		
School Management (Ind. Ped. 130)			3
Drill (Military 5, 6)	1		1
Military Science (Theo. Inst. 1, 2)	1		1
Approved Electives	9		12
		<hr/>	<hr/>
		17	17
SENIOR YEAR			
National Government (Com. 320)	3		
State and Municipal Government (Com. 322)			3
General Methods (Ind. Ped. 140)	3		
Special Methods in Agriculture (Ind. Ped. 150)			3
Extension Methods in Agriculture (Ind. Ped. 151)			1
Composition of Addresses (Eng. 103)	2		
Approved Electives	8		9
		<hr/>	<hr/>
		16	16

*Not less than five credits per semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

SCHOOL OF FORESTRY

The State of Oregon is the most important timber state in the Union. The present stumpage is estimated at more than 477 billion feet, board measure. This immense property represents approximately one-fifth of the standing timber remaining in the United States. About three-fourths of this amount is in private holdings. The greater part of this will doubtless be cut within the next twenty-five years. That held by the Federal government, in the National Forests, covering an area of more than 16,000,000 acres, will be cut as the needs of the people require, but the land will be devoted to the production of new timber crops, for all time to come.

The courses in Logging Engineering and in General Forestry are designed to prepare men to be of use in harvesting and in caring for this great forest crop. In both courses the student is given thorough training in plane and topographic surveying. In addition to these subjects, each course deals with matters pertaining to its particular field. The man who plans to engage in general forestry work receives instruction in forest botany, silviculture, dendrology, timber technology, and forest management; while the man who proposes to go into the logging business is instructed in railroad surveying, bridge construction, the principles of steam engines and electric motors, and general logging devices and equipment.

In addition to the purely technical subjects, the student is required to take courses in economics, sociology, and government; for it is realized that it is as much the duty of the college to develop good citizens as it is to create efficient producers.

The industrial work is shaped, so far as practicable, to fit the peculiar conditions existing in the Pacific Northwest, and in Oregon in particular. Men in both courses are expected to devote the summer months to practical work in the woods and in the camps. During the college year frequent trips are made to adjacent forests, to nearby logging operations, to mills, to wood distillation plants, creosote works, and factories. Practical work in timber cruising, map making, and inspection and planning of logging operations may be done by the student at very small cost. The watershed which supplies the city of Corvallis, is at the disposal of the School of

Forestry for the demonstration of scientific methods. All things considered, the School of Forestry offers exceptional advantages to the man who wishes to study forestry in a region of real forests.

Forester's Short Course

(November 2, 1914, to April 16, 1915)

This course is designed to be of assistance to those who wish to enter the non-technical branches of the Forest Service, and to those who wish to engage in State forestry work. The standard of work, both in the State and in the Federal Service, is constantly advancing. Every man who desires to continue in either of these branches must keep abreast of this advancing standard. He should be able to do this through the medium of some or all the subjects offered in this course.

	<i>Semester</i>	
	1st.	2nd.
Forest Protection (For. A. B.).....	3	3
Forest Measurements (For. C. D.).....	3	3
Forest Surveying and Mapping (For. E. F.).....	3	3
Forest Improvements (For. G. H.).....	3	3
Forest Administration (For. K. L.).....	1	1
	—	—
	13	13

DEGREE COURSE IN GENERAL FORESTRY

FRESHMAN YEAR	<i>Semester</i>	
	1st.	2nd.
Modern English Prose (Eng. 81, 82).....	3	3
Trigonometry (Math. 14).....	3	
Elementary Analysis (Math. 34).....		3
General Forestry (Forestry 101).....	4	
Surveying (C. E. 232).....		4
General Chemistry (Chem. 100-101).....	3	3
Forest Botany (Botany 30, 31).....	3	3
Library Practice (Lib. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	—	—
	18 $\frac{1}{2}$	17 $\frac{1}{2}$

SOPHOMORE YEAR	Semester	
	1st.	2nd.
General Physics (Physics 1, 2).....	3	3
General Zoology (Zool. 101, 102).....	3	3
Topographic Surveying (C. E. 233).....	4	
Forest Pathology and Taxonomy (Bot. 35).....		4
Silviculture (Forestry 201-202).....	3	3
Forest Geology (Mining 161).....	3	
Forest Protection (Forestry 505).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

JUNIOR YEAR		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Forest Mensuration (301-302).....	4	4
Forest Entomology (Zoology 304).....		3
Advanced Silviculture (Forestry 203, 204).....	3	2
Elementary Economics (Com. 210).....	3	
Forest History and Economics (Forestry 103).....		3
Forest Surveying and Mapping (Forestry 303).....	2	
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
	<hr/> 17	<hr/> 17

SENIOR YEAR		
Management (Forestry 401-402).....	5	4
Dendrology (Forestry 501).....	5	
Lumbering (Forestry 404).....		5
Forest Administration and Improvement (For. 405)....	3	
Timber Technology (Forestry 502).....		4
Timber Testing (Exp. E. 238).....		1
Seminar (Forestry 408-409).....	3	2
	<hr/> 16	<hr/> 16

DEGREE COURSE IN LOGGING ENGINEERING

FRESHMAN YEAR	Semester	
	1st.	2nd.
Modern English Prose (Eng. 81, 82).....	3	3
Trigonometry (Math. 14).....	3	
Elementary Analysis (Math. 34).....		3
General Forestry (Forestry 101).....	4	
Surveying (C. E. 232).....		4
General Chemistry (Chem. 100-101).....	3	3
Woodwork (Shop 105, 111).....	2	2
Library Practice (Lib. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$

SOPHOMORE YEAR		
Engineering Physics (Physics 101-102).....	4	4
Principles of Economics (Com. 210).....	3	
Labor Problems (Com. 213).....		3
Blacksmithing (Shop 151).....	2	
Toolmaking and Tempering (Shop 152).....		1
Machine Shop (Shop 202).....		1
Topographic Surveying (C. E. 233).....	4	
Railroad Surveying (C. E. 274).....		4
Mechanical Drawing (M. E. 151).....	2	
Forest Protection (Forestry 505).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	JUNIOR YEAR	Semester	
		1st.	2d.
National Government (Com. 320).....	3		
State and Municipal Government (Com. 322).....			3
Mensuration (Forestry 301-302).....	4		4
Logging Railroads (Forestry 601).....	3		
Dendrology (Forestry 504).....			3
Forest Surveying and Mapping (Forestry 303).....	2		2
Logging Materials (Exp. E. 240).....			2
Elements of Steam Engineering (M. E. 300).....	3		
Mechanism (M. E. 204).....			3
Military Science (Theo. Inst. 1, 2).....	1		1
Drill (Military 5, 6).....	1		1
		<hr/>	<hr/>
		17	17
SENIOR YEAR			
Logging Engines (Forestry 602).....	4		
Bridge Construction (Forestry 603).....			3
Logging Devices and Equipment (For. 604, 605).....	5		4
Lumbering (Forestry 404).....			5
Management (Forestry 407).....	3		
Timber Technology (Forestry 502).....			4
Timber Testing (Exp. E. 238).....			1
Electrical Machinery (E. E. 403).....	2		
Special Subjects (For. 606).....	2		
		<hr/>	<hr/>
		16	17

SCHOOL OF HOME ECONOMICS

The School of Home Economics offers the following courses of study: a one-year vocational course entitled the Home Makers' Course; a four-weeks course in Food Preparation, Dressmaking, Textiles, etc., which is offered in connection with the Winter Short Course; a six-weeks course for teachers, offered in connection with the work of the Summer School; a night course of twelve weeks for women of mature years; and four four-year courses, each of which leads to the degree of Bachelor of Science.

VOCATIONAL COURSES. The one-year course for Home Makers is provided especially for those women whose schooling may not qualify them to enter the degree courses, whose duties demand that they shall content themselves with a briefer period of training for their life work, or whose aim in seeking training at the College is exclusively technical or vocational. The purpose of the other short courses in Home Economics is quite similar to this—to provide, in the short time assigned to the particular courses, the fullest and most fruitful training that is possible to offer with the facilities of a thoroughly modern School of Home Economics, and to present this training in such a way that it shall be most immediately and constructively helpful to the particular patrons of the given course. Only the one-year vocational course and the regular degree courses are outlined here, the others being presented in the usual special bulletins issued for the Winter Short Course and the Summer School. Admission to any of the vocational courses demands an educational qualification not greater than an eighth grade or common school course; and in the instance of mature persons, otherwise capable of carrying on the work, even this qualification may be waived.

DEGREE COURSES. Admission to the degree courses requires the completion of at least three years' work in a standard high school. These courses are planned fundamentally to equip women for their normal life service, that of home makers. While the first three years of all the courses are identical, opportunity is given during the senior year to specialize in any one of four fields; namely, Domestic Science, Domestic Art, Home Administration, and Institutional Management.

Fundamentally, the young women in the School of Home Economics are offered such training as will help them to be prepared to adjust themselves readily to their environment. Since the relation of women to the economic world has undergone great changes during the last one or two decades, it follows that the education of young women must be such that it will prepare them to be efficient and serviceable to their community.

That the young women completing this course may be good citizens as well as good housekeepers; good business managers in their homes, as well as good cooks; broadly educated women, as well as specially trained workers, the courses of study in the School of Home Economics have been planned to give a liberal as well as a technical education.

Many opportunities are open for the woman capable of solving the problems of good food service for large numbers of people, and for experts in the management of large institutions. Equally attractive opportunities are available for the expert needlewoman, the tasteful designer of gowns, the competent dressmaker or milliner, the ladies' tailor, and the woman with artistic resources as a household decorator and furnisher. Opportunities for teaching Home Economics, not only in the high schools and colleges, but as supervisors in the common schools of cities, and in the consolidated community schools of progressive rural communities, are becoming more general and more desirable. Facilities for specializing in this work at the College are therefore given special attention.

More and more the life of the modern community is dependent upon institutions. Women are rapidly taking their places as executive and administrative leaders in the important functions of these institutions. Hospitals, Institutional Homes, Asylums, Educational Institutions, and Social Centers, are more and more demanding the service of the women of skilled technical accomplishments. There is a growing demand for dietiticians in the hospitals and large institutions. The training in dietetics, catering, and business management offered the young women at the College through the School of Home Economics, assists in the liberal and practical preparation for this employment.

Quartered in a new building, provided with a thoroughly practical modern heating, ventilating, and sanitary system, and equipped with the most approved facilities for conducting the work of the

various departments, the School of Home Economics is in a very fortunate position for making its courses of the utmost value to its patrons—not only to its resident students, but to the communities of the State at large wherever its extension activities may penetrate.

Home Makers' Course

	<i>Semester</i>	
	1st.	2nd.
Food Preparation (D. S. H, 1)	6	6
Care of Children (D. S. J)		1
Hand Sewing and Garment Making, Dressmaking (D. A. K, L)	5	5
Sanitation and Care of the Home (D. S. K)	3	
Personal Hygiene (D. S. L)	2	
Preventive Medicine (Bact. 307)	1	
Home Nursing and Invalid Cookery (D. S. M)		2
House Furnishing (D. A. N)		2
Gynasium (Phys. Ed. 1, 2)	1	1
	—	—
	18	18

DEGREE COURSE IN HOME ECONOMICS

FRESHMAN YEAR	<i>Semester</i>	
	1st.	2nd.
General Chemistry (Chem. 102, 103)	3	3
Hand Sewing, Garment Making (D. A. 101, 102)	3	3
Freehand Drawing, Beginning Composition (Art 102, 103)	2	2
College Rhetoric (Eng. 31, 32)	3	3
Principles of Botany (Bot. 20)	3	
Functional Zoology (Zool. 103)		3
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Home and Private Business Management (Com. 122)		2
Gymnasium (Phys. Ed. 5, 6)	1	1
	—	—
	16	17

	Semester	
	1st.	2nd.
SOPHOMORE YEAR		
Organic Chemistry, Chemistry of Foods (Chem. 200, 402)	4	4
Food Preparation (D. S. 101, 102)	3	3
Design and Color (Art 204)	2	
Household Physics (Phys. 131)	4	
Household Bacteriology (Bact. 300)		3
Home Nursing (D. S. 511)		3
Essay, Drama (Eng. 51, 52)	3	3
Gymnasium (Phys. Ed. 7, 8)	1	1
	17	17
JUNIOR YEAR		
Principles of Economics, Practical Sociology (Com. 211, 251)	2	2
*Modern Language (French, German, or Spanish first year)	3	3
Food Preparation (D. S. 104, 105)	3	3
Physiology (Zool. 207, 208)	3	3
House Sanitation (D. S. 301)	2	
Housewifery (D. S. 510)		2
Dressmaking (D. A. 201, 202)	3	3
	16	16
SENIOR YEAR		
*Modern Language (French, German, or Spanish second year)	3	3
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Psychology (Ind. Ped. 101)	3	
House Decoration and Furnishing (D. A. 501)	3	
House Administration (D. S. 501)		3
Electives	4	7
	16	16

*Students presenting credits for two years' study in any one foreign language may elect other subjects in place of modern language as required in the above course.

The following group electives are suggested. Other electives may be taken with the consent of the Dean of the School.

Semester

(a) DOMESTIC SCIENCE.

1st 2nd

Dietetics (D. S. 201)	4	
Invalid Cookery (D. S. 202)		2
Ind. Ped. (160, 162)	3	3

(b) DOMESTIC ART.

Adv. Dressmaking (D. A. 203, 204)	3	3
Adv. Textiles (D. A. 601)		2
Costume Design (D. A. 701)	2	
Ind. Ped. (160, 161)	3	3

(c) HOME ADMINISTRATION.

Dietetics (D. S. 201)	4	
Invalid Cookery (D. S. 202)		2
Adv. Dressmaking (D. A. 203, 204)	3	3
Handwork and Weaving (D. A. 405)		2

(d) INSTITUTIONAL MANAGEMENT.

Dietetics (D. S. 201)	4	
Invalid Cookery (D. S. 202)		2
Institutional Management (D. S. 504)	3	
Catering (D. S. 210)		6

(e) EDUCATION.

History of Education (Ind. Ped. 120)		3
General Methods (Ind. Ped. 140)	3	
Ind. Ped. (160, 161, 162)	3	6

(f) APPLIED DESIGN.

Basketry (D. A. 402)	2	
Handwork and Weaving (D. A. 405)		2
Design (Art 204)	2	
Clay Modeling (Art 413, 414)	2	2
Metal Work (Art 600, 601)	2	2

SCHOOL OF ENGINEERING

Four-year courses leading to the degree of Bachelor of Science are offered in the School of Engineering as follows:

- A course in Civil Engineering.*
- A course in Electrical Engineering.
- A course in Mechanical Engineering.
- A course in Highway Engineering.
- A course in Irrigation Engineering.
- A course in Industrial Arts.

A three-year vocational course in Mechanic Arts is also offered. While this course does not lead to a degree, a certificate or diploma will be awarded to those students who complete it.

COURSE IN CIVIL ENGINEERING*

The purpose of this course is to give the student thorough theoretical instruction, accompanied by as much laboratory and field practice as possible. The course includes such basic studies as English, Mathematics, Chemistry, Physics, Drawing, Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department. The student has the opportunity, during the senior year, to select his work along lines that he is most interested in.

Recognizing the value of drawing to the professional engineer, not only as a means of expressing his ideas and of carrying out his plans, but also as a means by which the young graduate may enter some of the most desirable positions, the department lays special emphasis upon this subject. Much drawing is also required in connection with the preparation of plans and working drawings, as part of the office work of the higher technical courses.

The work in Surveying begins with the freshman year, and continues through the sophomore year, with from six to nine hours of field practice a week. The student serves in subordinate positions at first, and gradually advances as a knowledge of the instruments is acquired. After having served his term as an apprentice, he is placed in charge of field parties and is held responsible for

*No work below sophomore grade will be given in Civil Engineering during the year 1914-15.

the results accomplished. During the freshman year he is given practice in land surveying and leveling, and during the sophomore year in topographic and railroad surveying. At all times, conscientious attention to duty, accuracy, and speed will be demanded. Every student keeps full and accurate notes of all work done in the field. These, after being criticised, are transcribed and filed with the instructor.

DEGREE COURSE IN CIVIL ENGINEERING

SOPHOMORE YEAR	Semester	
	1st.	2nd.
Differential Calculus, Integral Calculus (Math. 51, 52)	4	4
Engineering Physics (Phys. 101, 102)	4	4
Topographic Surveying (C. E. 223)	5	
Railroad and Canal Surveying (C. E. 272)		5
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4)	1	1
*Electives (Restricted)	3	3
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
JUNIOR YEAR		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Roads and Pavements (C. E. 405)	3	
Graphic Statics (C. E. 511)	2	
Hydraulics (I. E.)		3
Cement and Highway Laboratory (Exp. E. 231)	2	
Structural Materials Laboratory (Exp. E. 232)		3
Military Science (Theo. Inst. 1, 2)	1	1
Masonry and Foundations (C. E. 552)		3
*Electives (Restricted)	3	3
	<hr/> 17	<hr/> 17

*Approved Electives—English, Modern Language, Economics, Constitutional Law, State and Municipal Governments, Geology, Differential Equations, Least Squares.

The following group electives are suggested. Other studies may be arranged for by consultation with the head of the department.

SENIOR YEAR	Semester	
	1st.	2nd.
Highway Bridges (C. E. 513, 514)	4	4
Engineering Seminar (C. E. 605, 606)	1	1
Reinforced Concrete (C. E. 553)	3	
Contracts and Specifications (C. E. 607)		2
Electives (Either group 1, 2, 3, 4)	8	9
	<hr/>	<hr/>
	16	16

GROUP 1

Highway Engineering (C. E. 407)	5	
Economics of Highway Construction (C. E. 410)		2
Highway Laboratory (Advanced) (Exp. E. 233)	2	
Road Machinery (M. E. 302)		1
Precise Surveying and Geodesy (C. E. 252)		3
Electives	1	3
	<hr/>	<hr/>
	8	9

GROUP 2.

Sanitary Engineering (C. E. 301)	3	
Hydraulics Laboratory (Exp. E. 262)		2
Water Supply Engineering (I. E. 301)	4	
Hydraulic Pumps and Motors (I. E. 202) or Chem- istry of Water (Chem. 403)		2
Study of Electric Machinery (E. E. 402)		4
Electives	1	1
	<hr/>	<hr/>
	8	9

GROUP 3

Structural Engineering (C. E. 515, 516)	3	2
Study of Electric Machinery (E. E. 402)		4
Electives	5	3
	<hr/>	<hr/>
	8	9

	GROUP 4.	<i>Semester</i>	
		1st.	2nd.
Railway Engineering (C. E. 281, 282)		3	3
Study of Electric Machinery (E. E. 402)			4
Electives		5	2
		<hr/> 8	<hr/> 9

COURSE IN ELECTRICAL ENGINEERING

COURSES. Since the advent of steam as a motive power, it is probable that no agency has so deeply affected the course of history and the intimate life of a large portion of the human race as has the electric current, whether used in the transmission of intelligence, to furnish light, or to provide power for transportation and the industries.

Already the electrical industries are counted among the greatest in the world; their employees number more than a hundred thousand in the United States alone; their business in this country doubles every five years; and their field is ever expanding.

Notwithstanding this fact, most of the business is controlled by comparatively few corporations. The competition for desirable positions is therefore keen; and since the field in Electrical Engineering for the independent engineer is limited, only men of exceptional ability, energy, and character become more than salaried employees who are obliged to work very hard for comparatively small compensation.

Accordingly, no man is advised to take Electrical Engineering who does not consider himself, by taste and ability, exceptionally fitted therefor.

For men interested chiefly in the commercial, or business side of the profession, it is believed that the electrical supply and contracting business offers opportunities that are unusual, but which, nevertheless, have been practically overlooked by college graduates. Accordingly, special work in accounting, commercial law, the study of electrical appliances, and the principles of the contracting business are offered for those who would care to enter this field.

The College course is designed especially to train the young engineer in the theory of his profession, such practical work as is given in shop and laboratory being subordinated to this end. Prac-

tical acquaintance with actual conditions can be acquired only in the field, during vacation and after graduation. For this reason, and in order to supplement his college education, the student is urged to spend at least a part of his vacation in some line of electrical industry.

Starting with the foundation subjects of mathematics, science, drawing, and shopwork, the student proceeds through the study of form expression in Descriptive Geometry, Mechanism, the laws of Mechanics, Strength of Materials, stress in structures and machinery; through the study of electricity and its application to machinery, the characteristic performance of electrical apparatus, its design and operation; through the study of thermodynamics as applied to various types of heat engines, and finally to the composite power system involving the steam or hydro-electric power plant and the system for transmitting and distributing electrical energy.

ELECTIVES. The course in Electrical Engineering is designed to meet the needs of two classes of students, those who expect to become corporation employees, and those who desire to engage in the supply and contracting business on their own account. In the freshman year one of three elective subjects must be chosen, English, Modern Language, or Accounting. It is expected that the latter course will be elected by students who intend to prepare for the supply and contracting business.

DEGREE COURSE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR	Semester	
	1st.	2nd.
Trigonometry, College Algebra (Math. 11, 21)	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem. 10, 11)*	3	3
Mechanical Drawing (M. E. 151)	2	
Descriptive Geometry (M. E. 152)		3
Foundry (Ind. Arts 171)	2	
Patternmaking (Ind. Arts 131)		2
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Modern English Prose (Eng. 81, 82) or Adv. German or Adv. French (Mod. Lang. 207, 208 or 107, 108)** or Accounting (Commerce 100, 108)***	3	3
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

SOPHOMORE YEAR

Differential and Integral Calculus (Math. 51, 52)	4	4
Engineering Physics (Physics 101, 102)	4	4
Mechanical Drawing (M. E. 153)	3	
Mechanism (M. E. 204)		3
Blacksmithing (Ind. Arts 151)	2	
Machine Shop (Ind. Arts 206)		2
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
Approved Option†	3	3
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

*Students entering with credits in high school chemistry will be expected to register for Chemistry 100 and 101.

**By special permission a student may elect beginning German or French, (Modern Language 201, 202 or 101, 102). Modern language elected in the freshman year must be continued in the sophomore year.

***If accounting is elected in the Freshman year it must be followed by Commercial Law (Commerce 300, 301), in the sophomore year.

†Restricted to English, Modern Language, Economics, Commercial Law, Chemistry, Surveying, Shopwork. See foot notes under schedules for freshman year.

JUNIOR YEAR	Semester	
	1st.	2nd.
Principles of Applied Electricity (E. E. 101, 102).....	5	3
Electrical Engineering Laboratory (E. E. 201, 202)....	3	3
Electrical and Magnetic Measurements (Physics 201)	2	
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Theory and Practice of Steam Engineering (M. E. 305)		3
Hydraulics (I. E. 102)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	<hr/> 17	<hr/> 17

Students desiring to elect Differential Equations may defer Physics 201 to the second semester. This involves the carrying of an extra credit in the first semester and two extra credits in the second semester.

SENIOR YEAR	Semester	
	1st.	2nd.
Alternating Current Machinery (E. E. 103).....	3	
Power Plants, Transmission and Distribution Systems (E. E. 108)		3
Problems in Design (E. E. 105, 106)	2	2
Electrical Engineering Laboratory (E. E. 203)	3	
Applied Mechanics Laboratory (Exp. E. 205)	3	
Power and Hydraulic Laboratory (Exp. E. 206)		3
Advanced Steam Engineering (M. E. 306)	3	
Optional and Thesis	2	8
	<hr/> 16	<hr/> 16

One of the following optional groups must be selected:

RAILWAY	Semester	
	1st.	2nd.
Electric Railways (E. E. 308, 309)	2	3
Railway Signalling (E. E. 312)		2
Thesis (E. E. 306)		3
	<hr/> 2	<hr/> 8

	<i>Semester</i>	
	1st.	2nd.
POWER PLANTS		
Storage Batteries (E. E. 304)	1	
Periodical Literature (E. E. 301)	1	
Steam Power Plant Design (M. E. 316)		3
Illumination (Physics 212)		3
Thesis (E. E. 306)		2
	<hr/>	<hr/>
	2	8
ILLUMINATION AND CONTRACTING		
Elective	2	
Illumination (Physics 212)		3
Electrical Contracting (E. E. 110)		3
Thesis (E. E. 306)		2
	<hr/>	<hr/>
	2	8

COURSE IN MECHANICAL ENGINEERING

The course in Mechanical Engineering has for its purpose the preparation of young men for positions of usefulness and responsibility in the industrial life of the country.

The Pacific Northwest is just now entering upon a period of rapid progress in the building of railroads, the development of water power, the marketing of forest products, and the upbuilding of manufacturing, all of which require men conversant with the general principles of engineering. It is the purpose of all engineering courses to contribute to this general advancement, by turning out graduates equipped with the necessary knowledge and skill to make them active factors in this great work.

It is the general plan of the course in Mechanical Engineering to lay a broad foundation in English, Mathematics, Chemistry, and Physics, accompanied by Drawing and Shopwork, during the first two years of the course. The work of the last two years is more technical and professional in its nature, consisting in a study of the principles involved in the development of power by steam engines, water wheels, gas and gasoline engines, and steam turbines. It also involves a critical study of the design of machines and materials entering into their construction, as well as tests to determine their efficiency.

Instruction is given by means of lectures, recitations, and laboratory exercises. The scientific principles involved in machines and mechanical movements are taught in the class room, as well as the application of mathematics to the solution of problems in mechanical engineering. In the shops, the student learns the use of tools and the value of different methods of doing work from the standpoint of economical construction. In the draughting room, he learns to make working drawings and blueprints of machines, and to formulate designs of his own.

With these advantages to aid him, the ambitious student should be able to take and maintain a position in the general industrial and engineering development which is the leading and characteristic feature of the age in which we live.

DEGREE COURSE IN MECHANICAL ENGINEERING

FRESHMAN YEAR	Semester	
	1st.	2nd.
Modern English Prose (English 81, 82)*	3	3
Trigonometry, College Algebra (Math. 11, 21)	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem. 100, 101)	3	3
Mechanical Drawing (M. E. 151)	2	
Descriptive Geometry (M. E. 152)		3
Foundry (Ind. Arts 171)	2	
Patternmaking (Ind. Arts 131)		2
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

*Upon approval of the Dean, students may substitute a Modern Language for English in the freshman year and for Commercial Geography and the Principles of Economics in the sophomore year.

SOPHOMORE YEAR

Semester

1st. 2nd.

Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Physics 101, 102).....	4	4
Mechanical Drawing (M. E. 153).....	3	
Mechanism (M. E. 204).....		3
Commercial Geography (Com. 202)*	3	
Principles of Economics (Com. 212)*		3
Blacksmithing (Ind. Arts 151).....	2	
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind. Arts 202).....		1
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

JUNIOR YEAR

Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Theory and Practice of Steam Engineering (M. E. 305)	3	
Advanced Steam Engineering (M. E. 306).....		3
Applied Mechanics Laboratory (Exp. E. 201).....	3	
Power and Hydraulic Laboratory (Exp. E. 202).....		3
Study of Electrical Machinery (E. E. 402).....		4
Graphic Statics (C. E. 511).....	2	
Machine Shop (Ind. Arts 203, 204).....	2	2
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
	<hr/>	<hr/>
	17	17

*Upon approval of the Dean, students may substitute a Modern Language for English in the freshman year and for Commercial Geography and the Principles of Economics in the sophomore year.

SENIOR YEAR	Semester	
	1st.	2nd.
Machine Design (M. E. 205, 206)	4	3
Steam Boilers (M. E. 309)	2	
Steam Turbines (M. E. 312)		2
Hydraulics (I. E. 103)	3	
Steam Power Plant Design (M. E. 316)		3
Advanced Mechanics Laboratory (Exp. E. 203)	3	
Advanced Power Laboratory (Exp. E. 204)		3
Gas Engine Laboratory (Exp. E. 272)		2
Internal Combustion Motors (M. E. 346)		2
Heating and Ventilating (M. E. 331)	3	
Seminar (M. E. 351, 352)	1	1
	<hr/> 16	<hr/> 16

COURSE IN HIGHWAY ENGINEERING

There are few lines of public endeavor where more money is being spent, or where a higher degree of technical skill and training is required than in the field of highway engineering. The purpose of this course is to meet the demand in this State and throughout the Northwest for men equipped to take charge of road and city street construction and maintenance work. Aside from the opportunity for useful and honorable service, no field, it is believed, offers greater encouragement in a financial way to the young man of ambition and ability.

Thorough theoretical instruction is accompanied by as much laboratory and field practice as possible. The course includes such basic studies as English, Mathematics, Chemistry, Physics, Drawing, Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department.

The department of Experimental Engineering is equipped with complete and thoroughly up-to-date testing laboratories, including the very latest and best cement and highway testing machinery, thus affording students in Highway and in Civil Engineering courses the opportunity of studying first hand the strength and properties of the various engineering materials.

In the study of highways, special reference is made to the conditions and needs of Oregon. Due consideration is given to the construction and maintenance of dirt, gravel, and broken stone roads

as well as to the higher types. In consequence of the vast area of the State, this class of roads must, of necessity, constitute the greater part of its highways for many years.

DEGREE COURSE IN HIGHWAY ENGINEERING

FRESHMAN YEAR	Semester	
	1st.	2nd.
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100, 101).....	3	3
Mechanical Drawing (C. E. 105).....	4	
Engineering Drawing (C. E. 111).....		3
Descriptive Geometry (M. E. 152).....	3	
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Plane Surveying (C. E. 222).....		5
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2).....	1	1
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
SOPHOMORE YEAR		
Differential Calculus, Integral Calculus (Math. 51, 52)	4	4
Engineering Physics (Phys. 101, 102).....	4	4
Topographic Surveying (C. E. 223).....	5	
Railroad and Canal Surveying (C. E. 272).....		5
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
Electives (Restricted).....	3	3
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	JUNIOR YEAR	Semester	
		1st.	2nd.
Statics and Dynamics (M. E. 251).....	5		
Strength of Materials (M. E. 252).....			3
Roads and Pavements (C. E. 405).....	3		
Graphic Statics (C. E. 511).....	2		
Hydraulics (I. E. 102).....			3
Cement and Highway Laboratory (Exp. E. 231).....	2		
Structural Materials, Laboratory (Exp. E. 232).....			3
Military Science (Theo. Inst. 1, 2).....	1		1
Masonry and Foundations (C. E. 552).....			3
*Electives (Restricted)	3		3
		17	17
SENIOR YEAR			
Highway Bridges (C. E. 513, 514).....	4		4
Engineering Seminar (C. E. 605, 606).....	1		1
Reinforced Concrete (C. E. 553)	3		
Contracts and Specifications (C. E. 607).....			2
Road Machinery (M. E. 302).....	1		
Highway Engineering (C. E. 407, 408).....	4		4
Economy of Highway Construction (C. E. 410).....			2
Advanced Highway Laboratory (Exp. E. 233)	2		
**Electives	1		3
		16	16

IRRIGATION ENGINEERING

Successful agriculture in the arid parts of Oregon is based on the science of irrigation. The widespread development of irrigation lands in this and other states of the arid west, by means of both gravity supplies and pumping systems, has extended the necessary qualifications of the engineer to include a knowledge of irrigation methods, pumping, and power machinery. The province of the engineer, therefore, comprises the development, conservation, and economical use of limited water supplies. In recognition of the need,

*Approved Electives: English, Modern Language, Economics, National Government, State and Municipal Governments, Geology, Differential Equations, Least Squares.

**Chemistry of Road Materials, Design of Highway Structures or Materials Laboratory (Advanced Course).

in the Pacific Northwest, for Engineers trained in irrigation and hydraulics, the course in Irrigation Engineering has been established.

Realizing, however, that the young engineer is frequently obliged to take charge of work which properly falls outside of the field in which he has specialized, the course in Irrigation Engineering is arranged to cover as broad a field as practicable, in order that the graduate may experience little difficulty in accommodating himself to the available positions. The curriculum in this department has for its purpose, in the freshman and sophomore years, the laying of a foundation on which to build the more specialized and technical work of the junior and senior years. The last two years are intended to equip the student with a well-rounded knowledge of hydraulics and irrigation engineering—a knowledge which will enable the student to hold a responsible position in reclamation work.

The work of this department is designed to furnish a thorough course of theoretical instruction accompanied by practice in the various lines of irrigation engineering. The course, moreover, is made practical by a large proportion of laboratory and field practice in conjunction with the theoretical work. Special stress is laid on the solution of problems, and experiments in the laboratory. Emphasis is laid on skill in handling surveying and water-measuring instruments. The student is taught how to make stream measurements, design, lay out, and construct dams, canals, headworks, diversion weirs, flumes, pipe lines, and distributing systems.

Inspection trips are conducted in the junior and senior year to afford the students an opportunity to familiarize themselves with actual engineering work.

ELECTIVES. Ample opportunity is given the student to elect courses outside of the School of Engineering. This provision is made that the student may be encouraged to study Economics, Political Science, Accounting, English, and Modern Languages, a knowledge of each of which is helpful, if not essential, in the engineering profession.

DEGREE COURSE IN IRRIGATION ENGINEERING

FRESHMAN YEAR	Semester	
	1st.	2nd.
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chemistry 100, 101).....	3	3
Mechanical Drawing (C. E. 105).....	4	
Engineering Drawing (C. E. 111).....		3
Descriptive Geometry (M. E. 152).....	3	
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Plane Surveying (C. E. 222).....		5
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2)	1	1
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
SOPHOMORE YEAR		
Differential Calculus, Integral Calculus, (Math. 51, 52)	4	4
Engineering Physics (Physics 101, 102).....	4	4
Topographic Surveying (C. E. 223)	5	
Railroad and Canal Surveying (C. E. 272)		5
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
Electives (Restricted)	3	3
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

JUNIOR YEAR

Semester
1st 2nd

Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Roads and Pavements (C. E. 405)	3	
Graphic Statics (C. E. 511)	2	
Hydraulics (I. E. 102)		3
Cement and Highway Laboratory (Exp. E. 231)	2	
Structural Materials Laboratory (Exp. E. 232)		3
Masonry and Foundations (C. E. 552)		3
Military Science (Theo. Inst. 1, 2)	1	1
Drill (Military 5, 6)	1	1
Electives (Restricted)	3	3
	<hr/> 17	<hr/> 17

SENIOR YEAR

Engineering Seminar (C. E. 605, 606)	1	1
Reinforced Concrete (C. E. 553)	3	
Contracts and Specifications (C. E. 607)		2
Water Supply Engineering (I. E. 301)	4	
Irrigation Engineering (I. E. 401)	2	
Design of Irrigation Structures (I. E. 402)		2
Hydraulics Laboratory (Exp. E. 262)		2
Hydraulic Pumps and Motors (I. E. 202)		2
Soil Physics (Agron. 103)	3	
Irrigation Farming (Agron. 302)		3
Water Law (I. E. 602)		1
Electives (Approved)	3	3
	<hr/> 16	<hr/> 16

The following is a list of approved electives from which the student must choose three credit hours each semester in those years in which elective courses are offered. Unless the student has credit for at least three credit hours of modern languages, he will not be permitted to register for less than twelve credits of any modern language course. Unless satisfactory credits are produced, no student will be permitted to register for less than six credits of economics, when such electives are chosen.

	Semester	
	1st	2nd
SOPHOMORE AND JUNIOR YEARS		
Modern English Prose (Eng. 81, 82).....	3	3
French, German or Spanish (Mod. Lang. 101, 102, 103, 104, 201, 202, 203, 204, 301, 302, 304).....	3	3
Commercial Geography (Com. 202).....	3	
Principles of Economics (Com. 212)		3
General Accounting, Special Accounting (Com. 107, 108)	2	3
SENIOR YEAR		
Forage Crops (Agron. 203).....	2	
Land Drainage (Agron. 301).....		3
Highway Bridges (C. E. 513, 514).....	4	4
Water Power (I. E. 204).....		3
Electrical Machinery (E. E. 402).....		4
Advanced Materials Laboratory (Exp. E. 235).....		2
Climatology (Agron. 303)		1
Irrigation Institutions (Agron. 305).....	2	

COURSE IN INDUSTRIAL ARTS

There is a steadily increasing demand in Oregon for competent teachers of manual training. These instructors teach in both the elementary and high school grades. In fact, the up-to-date school provides for manual, or constructive work of various kinds from the first grade up. The well-trained teacher must therefore understand both the technique and theory of his subject as adapted to the needs of pupils.

Below the sixth grade this manual instruction for both boys and girls is given by the regular grade teachers; but the supervisor and special teacher of manual training should be able to organize this work and correlate it with the other school subjects, and particularly with the later formal course in manual arts. For the boys

this will take the form of instruction in woodworking, metals, machine shop, and in some schools, vocational training in the various trades. For the girls, it will lead to the study of the several phases of home economics.

A college degree course of the same general standard as the other B. S. courses is provided, in order that the young men who specialize in this field may receive a preparation that will place them on a par with the high school teachers in other branches. The relation of industrial instruction in the elementary and secondary schools to the industries of life, is more fundamental and direct than most of the other branches taught. It also has its important relations to higher education. It becomes necessary, therefore, to give these instructors a training that will make them more than masters of the mechanical processes.

The properly prepared teacher of industrial arts must have an appreciative understanding of the origin and development of the industries; their relation to economic, social, and political life; and a profound conviction of the importance and dignity of their contribution to the progress of mankind. He should also have the broad sympathies of the cultured man, in order to enable him to set before his pupils high and worthy ideals of life. The artisan, artist, or professional man is first of all a man and a citizen, and our schools must make him aware of his high privileges and responsibilities.

The Industrial Arts department is a part of the School of Engineering and has under its supervision all the shop courses offered in the other departments of the College.

DEGREE COURSE IN INDUSTRIAL ARTS

	FRESHMAN YEAR	
	Semester	
	1st	2nd
Modern English Prose (Eng. 81, 82).....	3	3
Trigonometry (Math. 12).....		3
Commercial Geography (Com. 202).....	3	
General Chemistry (Chem. 100, 101).....	3	3
Shop Drawing (Ind. Arts 301, 302).....	2	2
Manual Training (Ind. Arts 103, 104).....	3	3
Industrial Arts Drawing (Art 410, 411).....	1	2
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

SOPHOMORE YEAR

English, German, French or Spanish.....	3	3
General Physics (Phys. 1, 2).....	3	3
School Management (Ind. Ped. 130).....	3	
History of Education (Ind. Ped. 120).....		3
Patternmaking, Foundry (Ind. Arts 135, 171).....	3	3
Industrial Arts Design (Art 412).....		1
Drawing (M. E. 156).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Electives.....	4	
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

JUNIOR YEAR

Semester
1st 2nd

English, German, French or Spanish	3	3
General Psychology (Ind. Ped. 101).....	3	
General Method (Ind. Ped. 140).....		3
Forging (Ind. Arts 155)	2	
Hammered Metal Work (Ind. Arts 156).....		2
Architectural Drawing (Arch. 501)	3	
Descriptive Geometry (M. E. 152).....		3
Commercial Woods (For. 506).....		2
Plumbing (Ind. Arts M 1, N 1).....	2	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives	2	2
	<hr/> 17	<hr/> 17

SENIOR YEAR

Special Methods (Ind. Ped. 170).....		3
Machine Shop (Ind. Arts 208, 209).....	2	2
Manual Training for Elementary Grades (Ind. Arts 231)	2	2
Machine Design (M. E. 205).....	2	
Applied Mechanics Lab. (Exp. E. 207).....	2	
Power and Hydraulics Lab. (Exp. E. 208).....		2
Electrical Construction (E. E. 110, 111).....	2	2
Electives	6	5
	<hr/> 16	<hr/> 16

COURSE IN MECHANIC ARTS

This is a vocational course extending through three years, during which the student devotes at least one-third of his time to shop work and trade drawing. English, mathematics, chemistry, physics and elementary economics are also included in order to balance the course and give it educational value.

The student is permitted to specialize in the vocational work according to his individual preferences and qualifications. The choice of work includes Cabinetmaking, Patternmaking, Machine Shop Work, Electrical Construction, Plumbing, Blacksmithing and Foundry Work.

This is not to be regarded as a preparatory course for the degree courses in engineering. Such preparation can best be obtained in the regular accredited high schools of the State. Neither is it intended that this course shall entice students away from the high schools, but that it shall fill a need not generally provided for by the secondary schools of the State.

It is the purpose of this course to assist those who expect to make their way in the world by their manual skill in various lines of activity—those who feel that they cannot afford to take a degree course in college, but desire to get some vocational training in special lines, and at the same time secure the broadening influence of education in English, mathematics, and elementary science. While it is not the primary aim to train foremen and superintendents, it is believed that students after completing the course and gaining a few years of practical experience will be able to hold positions of responsibility, or to go into business for themselves.

The shops are equipped with the latest approved machinery and are well suited to carry on these practical courses.

This work is open to students who have completed the eighth grade, or equivalent, of the common schools, and who are sixteen years of age. Those who complete the three years of work and take all of the work outlined will be entitled to a diploma. In order to secure a diploma in Patternmaking, Carpentry and Cabinetmaking, Machine Shop Practice, Electrical Construction, or Plumbing, at least two years must be devoted to the desired subject. The other year may be devoted to selected courses subject to the approval of the head of the department. A general shop course may

be taken by combining one year of Machine Shop, one year of Blacksmithing, and one year of Foundry Work; or one year of Woodworking, one year of Foundry, and one year of Machine Shop.

Three-Year Course in Mechanic Arts

	FIRST YEAR	
	Semester 1st	2nd
Elementary Constructive English, Composition (Eng. A, B)	3	3
Algebra (Math. A, B)	5	5
History (Com. K)	2	2
Vocational Drawing (Ind. Arts A-1, B-1)	2	2
*Shop Work (According to trade selected)	4	4
Drill (Military, A, B)	1	1
Gymnasium (Phys. Ed. 11, 12)		
	17½	17½
	SECOND YEAR	
	Semester 1st	2nd
Advanced Composition and Literature (Eng. C, D)	3	3
Shop Arithmetic (Math. O)	4	
Plane Geometry (Math. L)		4
Trade Drawing (Ind. Arts A-2, B-2)	2	2
Chemistry (Chem. A, B)	3	3
*Shop Work (According to trade selected)	4	4
Drill (Military C, D)	1	1
Gymnasium Phys. Ed. 13, 14)	½	½
	17½	17½
	THIRD YEAR	
	Semester 1st	2nd
Geometry and Trigonometry (Math. T)	4	
Elementary Industrial Problems (Com. J)		3
Commercial Law (Com. L)	2	
Shop Accounting (Com. F)		2
Trade Drawing (Ind. Arts A-3, B-3)	2	2
Physics (Phys. A, B)	3	3
*Shop Work (According to trade selected)	4	4
Drill (Military E, F)	1	1
Electives	2	2
	18	17

*Shop Work. The student will choose the general line of shop work which he desires to pursue from the following: Cabinetmaking, Patternmaking, Machine Shop Work, Electrical Construction, Plumbing, Blacksmithing, and Foundry Work.

SCHOOL OF MINES

The course in Mining Engineering is designed to give the student a thorough training in the essential fundamentals of the sciences of Mining and Metallurgy. The course is of such a comprehensive character, however, that a graduate may choose his life work from a varied assortment of employments. He may earn a good salary as an assayer and chemist; a land or deputy mineral surveyor; a draughtsman and designer in an engineering establishment; on the geological staffs of great railroad, mining, or exploration companies; in the land classification work of the Government Forest Service; in the Government Geological or Coast and Geodetic Surveys; in state geological surveys; in many branches of actual mining, milling, and smelting operations; or, when the requisite experience and standing have been secured, as an expert examining and consulting engineer. Scientific prospecting is also a very promising possibility.

In order to fill properly positions calling for such varied qualifications, a student's training must be unusually broad and thorough. Close application during student days and a willingness to work hard and faithfully are, then, essential prerequisites to success in mining engineering; but if the apprentice period is somewhat arduous, the work is of a very interesting nature, and the rewards, both in money and satisfaction, are unusually great.

DEGREE COURSE IN MINING ENGINEERING

FRESHMAN YEAR	Semester.	
	1st	2nd
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100, 101).....	3	3
Mechanical Drawing (C. E. 105).....	4	
Dynamic and Structural Geology (Geol. 153).....	2	
Descriptive Geometry (M. E. 152).....		3
Plane Surveying (C. E. 232)		4
Woodwork (Ind. Arts 105).....	2	
Blacksmithing (Ind. Arts 152).....		1
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

SOPHOMORE YEAR

Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Phys. 101, 102)	4	4
Qualitative Analysis (Chem. 301).....	5	
Quantitative Analysis (Chem. 401).....		5
Crystallograph and Blowpipe Analysis (Geol. 111).....	3	
Determinative Mineralogy (Geol. 112)		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	JUNIOR YEAR	
	Semester 1st	2nd
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Hydraulics (I. E. 102)		3
Electrical Machinery (E. E. 402)		4
General Metallurgy (Chem. E. 411)	2½	
Historical Geology (Geol. 155)	1½	
Petrology (Geol. 131)		2
Fire Assaying (Chem. Eng. 401)	3	
Mine Surveying and Mining Law (Min. E. 212)		3
Ore Dressing (Min. E. 251)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	<hr/> 17	<hr/> 17
SENIOR YEAR		
Matallurgical Laboratory (Chem. E. 423)	2	
Cyanidation of Ores (Chem. E. 421)	3	
Matallurgy of Lead and Copper (Chem. E. 412)	3	
Design of Mine and Mill Structures (Min. E. 241)		3
Mining Methods (Min. E. 221)		3
Mining Geology (Geol. 181)	3	
Power Equipment (Min. E. 231)		3
Mine Economics (Min. E. 222)		3
Economic Geology (Geol. 182)		3
Mine Examinations and Reports (Min. E. 223)		1
General Engineering Laboratory (Exp. E. 210)	2	
Technical English (Eng. 141)	3	
	<hr/> 16	<hr/> 16

Note—Practical Work. All students in the School of Mines are required to do not less than two months' work in mines or industrial plants allied to the course chosen, or to take Geol. 190, before entering upon their senior year.

DEGREE COURSE IN CERAMICS

Freshman and sophomore years are identical with the freshman and sophomore years of the Degree Course in Mining Engineering.

JUNIOR YEAR	Semester	
	1st	2nd
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Hydraulics (I. E. 102)		3
Electrical Machinery (E. E. 402)		4
General Metallurgy (Chem. E. 411)	2½	
Historical Geology (Geol. 155)	1½	
Petrology (Geol. 131)		2
Ceramic Chemistry (Cer. 301)	3	
Ceramic Raw Materials (Cer. 303)	3	
Raw Materials Testing (Cer. 310)		2
Ceramic Calculations (Cer. 312)		1
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	<hr/> 17	<hr/> 17

SENIOR YEAR

Technical English (Eng. 141)	3	
Power Equipment (Min. E. 231)		3
General Engineering Laboratory (Exp. E. 210)	2	
Principles of Economic Geology (Geol. 181)	3	
Manufacture of Clay Products (Cer. 321)	4	
Clay Products Laboratory (Cer. 322)		3
Limes and Cements (Cer. 326)		3
Glasses, Glazes, and Enamels (Cer. 323)	4	
Ceramic Laboratory (Cer. 324)		2
Field Work and Report (Cer. 328)		1
Thesis (Cer. 330)		2
	<hr/> 16	<hr/> 16

(See note after Degree Course in Mining Engineering.)

DEGREE COURSE IN CHEMICAL ENGINEERING

Freshman and sophomore years are identical with the freshman and sophomore years of the Degree Course in Mining Engineering.

	JUNIOR YEAR	
	<i>Semester</i> 1st.	2nd.
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Hydraulics (I. E. 102)		3
Electrical Machinery (E. E. 402)		4
Physical Chemistry (Chem. 410)	3	
Organic Chemistry (Chem. 201)	4	3
Thermochemistry (Chem. E. 452)		3
Chemical and Metallurgical Processes (Chem. E. 431) ..	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	<hr/> 17	<hr/> 18
SENIOR YEAR		
Chemical Technology (Chem. E. 461, 462)	4	4
Electro-chemistry (Chem. 406)	3	
Electro-metallurgy (Chem. E. 442)		3
*Approved Electives	9	9
	<hr/> 16	<hr/> 16

(See note after the Degree Course in Mining Engineering.)

*Elective courses may be chosen in the departments of Physics and Chemistry, and the Schools of Engineering, Forestry, and Mines, upon the approval of the Dean of the School of Mines and the heads of the other departments or schools concerned.

THE SCHOOL OF COMMERCE

The School of Commerce offers two distinct courses of study; namely, (1) a four-year course leading to the degree of Bachelor of Science in Commerce; (2) a two-year vocational course leading to a Certificate of Business Proficiency. The practical side of every subject is especially emphasized, the constant aim being to train the student for service and efficiency.

THE VOCATIONAL COURSE

This course has been arranged primarily for the benefit of persons who have been unable to finish a high school course. The only entrance requirements are that the applicant must have had an eighth grade education, or its equivalent, and must be at least eighteen years of age. The student may emphasize bookkeeping and business methods, or stenography and typewriting; or he may have an opportunity to take both courses.

THE DEGREE COURSE

In the degree course all freshmen follow the same schedule; in the sophomore year, however, the student may choose as a major either accounting or secretarial studies, the latter including stenography and office practice. In the junior year, the student may further select a major course from one of the following: (1) Business Administration, (2) Economics, (3) Political Science and History, (4) Secretarial Studies. Instead of the above options, a liberal range of general electives is offered so that in the junior or senior year, the men may elect courses in Agriculture, Forestry, or Industrial Arts, while the women may elect courses in Home Economics.

DEPARTMENTS

For administrative purposes, the School of Commerce is organized into four distinct departments: (1) Business Administration, (2) Economics, (3) Political Science, and (4) Stenography and Office Training.

BUSINESS ADMINISTRATION

The distinctive work of the department of Business Administration in the School of Commerce is to train men and women for efficient business management. This includes thorough courses in the

various phases of Accounting, Auditing, Business Organization, Scientific Management, Advertising, and Salesmanship.

While the courses in Business Administration are primarily designed to fit students for the countinghouse and business office, including banking, it is found that such positions are generally only stepping stones to more advanced positions of trust and responsibility. A large percentage of the commercial students eventually engage in business of their own.

The School of Commerce has taken a leading part in developing courses in business methods especially adapted to the farm, the home, and cooperative enterprises. Such courses are given not only in residence but also by correspondence.

When it is remembered that every vocation has its business side, and that this phase of all pursuits is receiving increasing attention, it is apparent that the avenues for employment and the chances for promotion by the really competent business expert are almost unlimited. As a preparation for law or public accounting, this course, combined with economics and political science, is especially attractive. A large percentage of the graduates in commerce find employment as teachers of commercial subjects in state and private schools; to them the courses in business administration are very important.

ECONOMICS

The work of this department serves a three-fold purpose:

(1) *The training of men and women for citizenship.* Every citizen has business relations requiring a knowledge of the fundamental principles of political economy. The necessity of such knowledge is especially felt in a democracy where every man and woman has the right to vote, and is called upon to mold legislation directly. The basis for intelligently exercising this paramount duty of citizenship can only be supplied by a training in economics and sociology, the problems of which form the subject matter of all legislation.

(2) *To provide courses supplementary to the various branches of applied science.* To the agricultural college belongs the special task of developing the field of Agricultural Economics and Rural Sociology. It is the aim of this department to provide the necessary training for teachers in these subjects, to prepare specialists for research work in economic and social surveys of rural communities,

and to equip those who will make a life work of organizing farmers' associations for the more economical conduct of the business side of farming.

POLITICAL SCIENCE

The commercial work of the department of Political Science trains in the elements of business law, and prepares the student for ordinary business transactions. Politically, the department instructs in the composition and operation of our government, its relations with other nations, and indicates the need and field for individual participation in governmental affairs.

STENOGRAPHY AND OFFICE TRAINING

The courses offered by the department of Stenography and Office Training are for four classes of students: (a) those desiring a thorough training as stenographers and typists; (b) those desiring to go still further into the field of court reporting and secretarial training; (c) those desiring to enter the teaching profession; and (d) those commercial teachers desiring advanced training.

The ground covered by the special subjects offered by this department is as follows: Stenography and Typewriting, two years; Court Reporting, one year; Secretarial Training, one year; and Method of Teaching Commerce, one year.

Two-Year Business Course in Commerce

	FIRST YEAR		<i>Semester</i>	
	1st	2nd	1st	2nd
Elementary Constructive English and Composition				
(Eng. A, B)	3		3	
U. S. History (Hist. D).....	3			
Civics (Com. K)		3		
Stenography (Com. 400, 401)	4		4	
Commercial Arithmetic (Math. M, N)	3		3	
Bookkeeping (Com. B, C)	3		3	
Office Training and Typewriting (Com. R, S)	2		2	
Penmanship (Com. U, V)	2		2	
Gymnasium (Phys. Ed. 11, 12)	$\frac{1}{2}$		$\frac{1}{2}$	
Drill (Military A. B)	1		1	
	<hr/>		<hr/>	
	17 $\frac{1}{2}$		17 $\frac{1}{2}$	

	SECOND YEAR		Semester	
	1st	2nd	1st	2nd
Advanced Composition and Literature (Eng. C, D)....	3		3	
Business English (Eng. M)	3			
Accounting (Com. 100, 101)	3			4
or Stenography (Com. 402, 403)	4			4
Commercial Geography (Com. 200)	3			
History of Commerce (Com. 205)				3
Commercial Law (Com. L, M)	2			2
Technical English (Eng. N)				3
Penmanship (Com. W, X)	1			1
Gymnasium (Phys. Ed. 13, 14)	$\frac{1}{2}$			$\frac{1}{2}$
Drill (Military, C D)	1			1
	<hr/>		16 $\frac{1}{2}$	17 $\frac{1}{2}$

DEGREE COURSE IN COMMERCE

	FRESHMAN YEAR		Semester	
	1st	2nd	1st	2nd
Modern English Prose (Eng. 81, 82)*.....	3		3	
Science (Chem. 100, 101, or Phys. 1, 2, or Bact. 101, or Zool. 204, or Bot. 20)	3			3
Accounting (Com. 100, 101).....	3			4
Advanced Arithmetic (Math. 10)	3			
Contemporary American History (Hist. 62)				3
Commercial Geography (Com. 200)	3			
History of Commerce (Com. 205)				3
Library Practice (Libr. 1)	$\frac{1}{2}$			
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$			
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$			$\frac{1}{2}$
Drill (Military 1, 2)	1			1
	<hr/>		17 $\frac{1}{2}$	17 $\frac{1}{2}$

*Or French, German, Spanish (Mod. Lang. 103, 104; 203, 204; 303, 304).

	SOPHOMORE YEAR	
	Semester 1st	2nd
Technical English (Eng. 142)	3	
Practical Sociology (Com. 250)*		3
Economic History of United States (Com. 206)	3	
Principles of Economics (Com. 210)		3
Advanced Commercial Law (Com. 300, 301)	3	3
Accounting (Com. 102, 103) or Stenography (Com. 400, 401)	4	4
Modern European History (Hist. 40)		3
History of Oregon (Hist. 70)	3	
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4)	1	1
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

JUNIOR YEAR

Money and Banking (Com. 230)	3	
Labor Problems (Com. 213)**		3
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Business Organization and Management (Com. 110)**	3	
Advertising and Selling (Com. 112)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Electives †	6	6
	<hr/> 17	<hr/> 17

SENIOR YEAR

Public Finance (Com. 233)	3	
Transportation (Com. 240)		3
Comparative Study of Governments (Com. 325)		3
International Relations (Com. 302)	3	
Electives (see groups)	10	10
	<hr/> 16	<hr/> 16

*Or Modern Language continued. Credit will not be given for less than two years in any modern language.

**Students desiring formal training must substitute School Management (Ind. Ped. 130) for Labor Problems and Psychology. (Ind. Ped. 101) for Business Organization and Management.

†Students who elect Stenography in the sophomore year must take eight credits of advanced stenography in the junior year.

SUGGESTED ELECTIVE GROUPS

While the student may choose other subjects than those enumerated below, he is strongly urged to adopt one of the suggested groups.

Group 1		Semester	
JUNIOR YEAR		1st	2nd
Commercial Pharmacy (Phar. 160, 161)	3		3
Practical Public Speaking (Eng. 105, 106)	3		3
National Vitality (Com. 254)	1		
Journalism (Eng. 301)	1		
Bibliography (Com. 414)			1
	—	—	—
	8		7

SENIOR YEAR			
Accountancy Problems (Com. 105)	3		
Public Accounting and Auditing (Com. 106)			3
General Psychology (Ind. Ped. 101)	3		
History of Education (Ind. Ped. 120)			3
Economic Organization of Agriculture (Com. 264)....	3		
Insurance (Com. 235)			3
Thesis (Com. 111)	1		1
	—	—	—
	10		10

Group 2			
JUNIOR YEAR			
American Literature (Eng. 71, 72)	3		3
or Modern Language.			
Cooperation (Com. 260)			3
Science	3		
National Vitality (Com. 254)	1		
Bibliography (Com. 414)			1
	—	—	—
	7		7

	SENIOR YEAR	Semester	
		1st	2nd
Accountancy Problems (Com. 105)	3		
Public Accounting and Auditing (Com. 106)			3
Insurance (Com. 235)			3
Practical Public Speaking (Eng. 105)	3		
General Psychology (Ind. Ped. 101)	3		
History of Education (Ind. Ped. 120)			3
Thesis (Com. 111)	1		1
	—	—	—
	10		10

Group 3

JUNIOR YEAR			
History of English Literature (Eng. 61, 62)	3		3
Economic Organization of Agriculture (Com. 264)	3		
Insurance (Com. 235)			3
National Vitality (Com. 254)	1		
Bibliography (Com. 414)			1
	—	—	—
	7		7

SENIOR YEAR			
American Literature (Eng. 71, 72)	3		3
History of the British Empire (Hist. 52)	3		
American Diplomatic History (Hist. 80)			3
Accountancy Problems (Com. 105)	3		
Public Accounting and Auditing (Com. 106)			3
Journalism (Eng. 301)	1		
	—	—	—
	10		9

Group 4

JUNIOR YEAR			
Stenography (Com. 402, 403)	4		4
Office Training for Stenographers (Com. 412)	2		
Secretarial Training for Stenographers (Com. 413)			2
National Vitality (Com. 254)	1		
Bibliography (Com. 414)			1
	—	—	—
	7		7

	Semester	
	1st	2nd
SENIOR YEAR		
Special Methods (Ind. Ped. 180, 181) or Expert Speed		
Course (Com. 404, 405)	2	2
General Methods (Ind. Ped. 140)	3	
Business Organization and Management (Com. 110)	3	
History of Education (Ind. Ped. 120)		3
Labor Problems (Com. 213)		3
Public Speaking (Eng. 103, 104 or 201, 202)	2	2
	—	—
	10	10

Group 5

JUNIOR YEAR		
Soils (Agron. 101)	3	
Crops (Agron. 201)		3
Approved Electives	4	4
	—	—
	7	7

SENIOR YEAR

Stock Judging (An. Husb. 1)	2	
Live Stock Managing (An. Husb. 2)		3
Plant Propagation (Hort. 105)		2
Orchard and Garden Practice (Hort. 103)	2	
Approved Electives	6	5
	—	—
	10	10

Group 6

JUNIOR YEAR		
Food Preparation (D. S. 101)	3	
Food Preparation (D. S. 102)		3
Approved Electives	4	4
	—	—
	7	7

SENIOR YEAR

Dressmaking (D. A. 201)	3	
Dressmaking (D. A. 202)		3
Approved Electives	7	7
	—	—
	10	10

DEPARTMENT OF PHARMACY

It is now so generally recognized as to need but passing comment, that in order to attain to any degree of success in a scientific profession, it is necessary to be thoroughly trained in the science upon which the profession is based.

Pharmacy is one of the applied sciences; the pharmacist has constant use for a knowledge of the sciences of chemistry, physics, bacteriology, and botany. It is therefore of the utmost importance to the individual who has decided to enter pharmacy that he begin properly in the matter of an education. The institution in which the study of the natural sciences is prominently featured, is without doubt the one best qualified to afford him the training suited to his particular needs. In this connection, attention is directed to colleges of the land-grant or agricultural type. Financed by State and Federal Government, the material welfare of the institutions of this class is assured. With unusual facilities in the way of laboratories and equipment, and with an instructional force selected especially for the purpose, they are prepared to offer exceptional advantages for mental and manual training in those professions having for their foundation a knowledge of the sciences.

In recognition of the fitness of conditions and of an apparent need for such instruction, the Oregon Agricultural College, in 1898, added to its curricula a course in Pharmacy, the purpose of which is to afford the young men and women of the State an opportunity of obtaining a thorough training in the theoretical and practical features of this profession.

The course comprehends instruction in class and lecture room, extensive practice in the laboratory, and excursions afield in botany. The value of laboratory practice is fully appreciated; it is in this connection that facts mentioned in textbook and lecture are brought to the student's notice in such a way that their importance is emphasized, their significance demonstrated, and the facts themselves fixed in mind. In the pharmaceutical laboratories, the student becomes experienced in the manufacture of medicinal preparations and in filling prescriptions. In the laboratories of chemistry, botany, bacteriology, physics, and biology, he gains valuable experience in connection with each of these related sciences. It is

expected that owing to the nature and extent of the instruction given, graduates of this course will be qualified to assume positions of trust and responsibility in the professional world. Not only is this training of benefit to the pharmacist, but it forms an ideal pre-medical course.

The enactment of the Pure Food and Drug Law of 1906 has opened a new and attractive field for those who are proficient in chemical and pharmaceutical knowledge. Laboratories for the examination of food and drug samples are being established in the various large cities of the country by the Federal Government. Positions in these laboratories are in many instances held by graduates in pharmacy.

A four-year course, leading to the degree, Bachelor of Science in Pharmacy, is offered.

DEGREE COURSE IN PHARMACY

FRESHMAN YEAR	<i>Semester</i>	
	1st.	2nd.
Modern English Prose (Eng. 81, 82)	3	3
General Chemistry (Chem. 100, 101)	3	3
General Zoology (Zool. 101, 102)	3	3
Pharmaceutical Botany (Bot. 70, 71)	3	4
Modern Language (French, German, or Spanish).....	3	3
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	<i>Semester</i>	
	1st.	2nd.
SOPHOMORE YEAR		
Qualitative Analysis (Chem. 300)	3	
Organic Chemistry (Chem. 201)		3
Physiology and Anatomy (Zool. 201, 202)	3	3
Nomenclature (Phar. 100, 101)	2	2
Principles of Economics (Com. 210)		3
Business English (Eng. M)	3	
Commercial Law (Com. 306)	3	
Pharmacy Accounting (Com. 124)		2
Modern Language (French, German, or Spanish)	3	3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	18 $\frac{1}{2}$	17 $\frac{1}{2}$
JUNIOR YEAR		
General Pharmacy (Phar. 110, 111)	3	5
Pharmacognosy (Phar. 130, 131)	3	3
Therapeutics (Phar. 120)	2	
Quantitative Analysis (Chem. 400)	3	
Physiological Chemistry (Chem. 409)		4
Composition of Addresses (Eng. 103, 104)	2	2
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Drill (Military 5, 6)	1	1
	17	18
SENIOR YEAR		
*American Literature (Eng. 71, 72)	3	3
Pharmacy Bacteriology (Bact. 201, 202)	3	3
General Pharmacy (Phar. 112)	2	
Materia Medica (Phar. 140, 141)	3	3
Prescription Practice (Phar. 150, 151)	3	6
Military Science (Theo. Inst. 1, 2)	1	1
Electives, Approved	2	1
	17	17

*Note.—With the consent of the head of the department, certain other subjects may be elected in place of those in regular course indicated with an asterisk, thus *.

DEPARTMENTS OF INSTRUCTION

SCHOOL OF AGRICULTURE

AGRONOMY

PROFESSOR SCUDDER
ASSOCIATE PROFESSOR HYSLOP
ASSISTANT PROFESSOR POWERS
ASSISTANT PROFESSOR LARSON
MR. BRACKER
MR. COOTER

Agronomy is the science of the fields and the crops of the fields. Instruction in this science is offered by the department of Agronomy in the following subjects:

(a) Soils: Their origin, structure, fertility, cultivation, and improvement.

(b) Field Crops: Their history, growth, culture, improvement, and value.

(c) Irrigation and Drainage: The principles and methods of land drainage; the handling of land under irrigation.

(d) Farm Mechanics: The structure and machinery of the farm.

(e) Farm Management: Practical methods and systems for the operation of the farm under different conditions as a permanent money-making business.

In every subject, instruction is accomplished equally through class room, laboratory, and field work; theory is checked by practice. For the latter methods of instruction, the well-equipped laboratories of this department, the various soil conditions, numerous experimental crops, and extensive structures of the Experiment Station farms, offer excellent facilities. The large and newly equipped laboratories for the courses in Field Crops and the courses in Soils, in the Agronomy building, and for Farm Mechanics in the Farm Mechanics building, are not excelled by those of any institution in the west.

The one-year courses in Agronomy deal with the practical application of the underlying principles of agriculture to specific conditions—aiming to give the less prepared student as much information as possible in a short time concerning those practices most vital to successful farming—to send him back to the farm better prepared to cope with its problems.

The object of the collegiate courses in this department is to give the student such mastery of all the subjects relating to the soil, field crops, rural engineering, or farm management, as will help prepare him for the highest type of practical farming or farm management; or for a successful career in professional agriculture, such as is found in the U. S. Department of Agriculture, in the State Experiment Stations and Agricultural Colleges, or in Agricultural Extension work.

The farms of the Northwest offer even greater opportunities for men trained in knowledge of the soil, in the growing of crops, in irrigation and dry farming, and in farm management.

Agronomy 101 and 201 are prescribed for all collegiate agricultural students. The succeeding courses are the majors and minors offered to all upper classmen in Agriculture.

Those who elect Agronomy for their major work, may take any one of the following courses:

- (a) General Agronomy.
- (b) Soils.
- (c) Field Crops.
- (d) Irrigation Farming.
- (e) Farm Management.

Students majoring in Agronomy should confer with the head of the department to arrange for taking any one of the specialized courses named. Liberal elections in other departments are permitted wherever advisable.

One-Year Courses

A. FARM SOILS. A brief history of the origin of soils; the fertility of soils; the most valuable chemical constituents; their exhaustion and replenishment; the most important physical factors; their deterioration or improvement. The physical components; their relative value and amounts in soil mixtures. Practice in judging the chief soil types of Oregon. The effects upon soils of tillage, manuring, crop rotation, drainage, and irrigation.

One-year course; first semester; 3 credits; 2 recitations; 1 laboratory period.

B. FARM CROPS. A brief consideration of the adaptability, relative value, and best methods of growing the chief cereal, grass, legume, and succulent crops of Oregon for grain, pasture, meadow, soiling, silage, or seed purposes. Investigation of the sources of crop seed and the importance of seed purity and germinating power, with methods of testing seeds. Eradication of the most common weed enemies of field crops.

One-year course; second semester; 3 credits; 2 recitations; 1 laboratory period.

C. FARM MACHINES AND ENGINES. A general course in Farm Mechanics. The more important field machines and gasoline engines are studied. Farm buildings, concrete work, rope work, etc., are also given attention.

One-year course; first semester; 3 credits; 1 recitation; 2 laboratory periods.

D. PRACTICAL FARM DRAINAGE. The value of drainage, and the methods and cost of installing drainage systems under different soil and land conditions, district drainage, etc.

Elective in one-year course; second semester; 2 credits; 2 recitations; 1 laboratory period.

E. DRY FARMING PRACTICES. Soil and climatic conditions, and tillage and cropping methods as affecting successful dry farming practices.

Elective in one-year course; first semester; 2 credits; 2 recitations.

F. IRRIGATION FARMING PRACTICES. The most effective methods of handling irrigation waters and the different crops under irrigation, and the cost and profits thereof. Organization as affecting water use and control in irrigated districts.

One-year course; second semester; 2 credits; 2 recitations.

G. PRACTICAL FARM MANAGEMENT. The chief factors bearing on successful farming, such as the type of farming, factors of size, use of capital, handling of labor, proper equipment, cropping systems, marketing, etc., are given consideration from the practical standpoint.

One-year course; second semester; 2 credits; 2 recitations.

DEGREE COURSES

Soils

101. SOILS. Fundamental facts concerning the origin and formation of soils; soil moisture, heat and air; common soil processes, physical and chemical; plant foods and soil fertility; tillage, crop rotation, and manuring; the more important effects of bacteria on soil fertility; the benefits derived from drainage and irrigation; common farm machines, their use and care. The course will close with a brief survey of the agriculture of the State. Instruction will be given through lectures and notes, text and recitation, laboratory, and field observations.

Freshman year; first semester; 3 credits; 2 recitations; 1 laboratory period.

102. SOIL PHYSICS. Advanced study of the geology of soils, with their origin, formation, physical composition, and classification. Soil moisture and moisture movements and conservation. The various physical processes of the soil—surface tension, osmosis, capillarity, diffusion, etc. The effects of the various crops and the different methods of culture upon the texture, aeration, temperature, and moisture of the soil, and the resulting alteration in crop producing power. The influence of washing, drainage, and irrigation upon soils. Work in the laboratory will consist of the determination and comparison of such physical properties in the various soil types as, specific gravity, water retention, capillarity, organic content, etc.; the physical effect of mulches, rotations, and cropping; soil sampling and judging; the mechanical analysis of soils.

Elective; junior year; second semester; 4 credits; 2 recitations; two laboratory periods.*

103. SOIL PHYSICS. ELECTIVE. Similar to 102, but shorter, dealing with the more important phases of the subject. Designed as an elective for agricultural students unable to take the regular course in Soil Physics, and for students in Irrigation Engineering.

Elective; junior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

104. SOIL FERTILITY. The effect of the various crops upon the fertility of the soil. The maintenance or improvement of fertility by the use of fertilizers and manures. The composition and value

*By special arrangement students outside the Agronomy department may take this as a 3 credit course.

of the different fertilizers and manures. The effect of different rotations upon fertility. The fertility of the different types of Oregon soils; their plant food requirements and comparative values; methods of improvement of each. The effects of different systems of farming. Analysis, field plot, wire basket, and pot culture investigations. By arrangement, where necessary, the laboratory work may be omitted and the lecture work only, taken.

Prerequisite: Agronomy 102.

Elective; senior year; first semester; 5 credits; 3 recitations; 1 laboratory period.

105. DRY FARMING TILLAGE. One of the special courses given in Dry Farming, others of which are described under the Field Crops section as Semi-Arid Crop Production, and under the Farm Management section as Semi-Arid Farm Management. This course takes up the advanced study of the subject of moisture conservation, special tillage methods and machinery, soil and climatic conditions, etc., in dry farming regions, with particular reference to Oregon and the Northwestern states.

Prerequisite: Agronomy 102 or 103.

Elective; junior or senior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

106. SOIL SURVEYING. For the advanced student who wishes to specialize in soils for service in the state experiment stations or the Government Bureau of Soils. The course includes some advanced study of the classification of soils and soil areas of the United States, of Oregon, and of the Northwest, but most of the time is devoted to work in the field, making regular and completed soil surveys of assigned areas, with a report thereon.

Prerequisite: Agronomy 102 or 103.

Elective; senior year; second semester; 2 credits; 2 laboratory periods.

111. ADVANCED SOIL WORK. The advanced student specializing in soils may study the various soil types of Oregon through mechanical analysis, and other physical tests; may undertake field work in soil surveying and mapping; or, through wire basket, pot culture, and field plot tests, may determine the effects of various systems of cropping, or fertilizing, or of soil bacteria, upon soil fertility.

Prerequisites: Agronomy 101, 102, and 104.

Elective; senior or graduate year; either semester or both; 2 to 5 credits.

Field Crops

201. CROP PRODUCTION. The study of the chief field-crop seeds of Oregon; wheat, barley, oats, corn, vetch, clover, alfalfa, grasses, etc., their vitality, germination, preservation, growth and reproduction; preliminary judging; seed bed and seeding; climate and soil; culture and rotation; weed enemies, their prevention and eradication; harvesting, marketing, and profits; distribution and value to the State; methods of crop improvement. Class room, laboratory, and field work.

The course in Agriculture; freshman year; second semester; 3 credits; 2 recitations; 1 laboratory period.

202. CEREAL CROPS. A study of grains with special reference to those of Oregon, and the varying conditions of soil and climate under which they are grown; the culture and rotation best adapted to each; the various methods of harvesting and storage; the judging of grain; grading for market; markets and uses of each crop; improvement of crop seed; plant breeding.

Junior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

203. FORAGE CROPS. A less technical study of the legumes, grasses, and succulent crops, the course being especially adapted to the needs of the students in Animal and Dairy Husbandry. The adaptability and value of each of the forage plants as pasture, hay, soiling, or silage crops, together with the practical methods of growing each and the planning of rotations that will supply continuous green feed, will be fully discussed.

Elective; junior year; first semester; 2 credits; 2 recitations.

204. CROP IMPROVEMENT. A course dealing with the practical problems in the improvement of the quality and yield of the more important field crops, a knowledge of which would be necessary for the successful Oregon crop growers, especially those engaged in seed production. The different systems of breeding and the general principles of selection will be briefly discussed, and the best planting and cultural methods for the breeding plots studied. The work will be largely in the laboratory and field.

Junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

205. AGROSTOLOGY. A study of the grasses, legumes, and other forage crops. Methods of seeding for meadow, pasture, cover and soiling crops; maintenance of meadows and pastures; harvesting, curing, storing, baling, and using the various meadow crops; grazing, siloing, and soiling. The comparative structure and identification of the different forage plants, their adaptability to different conditions of soil and climate. Examination of commercial seed for viability and purity. The identification of weed seed. The production of forage crop seed.

Elective; senior year; first semester; 4 credits; 3 recitations; 1 laboratory period.

206. ADVANCED CROP BREEDING. A study of the laws, theories, and known facts concerning heredity, variation, and evolution in plant life. The causes of variation, behavior of characters in transmission, and the possibilities of inducing stability of character and establishing desirable types, will be discussed with special reference to field-crop improvement.

Prerequisite: Agronomy 204.

Senior year; second semester; 2 credits; 2 recitations.

207. SEMI-ARID CROP PRODUCTION. A course for students making a special study of Dry Farming or Irrigation Farming. Advanced work with the grain and forage crops adapted to the semi-arid regions of the United States, and the Northwest in particular. The course embraces the special methods of seeding, cultivating, and harvesting; comparison of water requirements, drouth and alkali resistance; special methods of seed production and plant breeding, etc., as applied to semi-arid production.

Prerequisite: Agronomy 202 and 205.

Elective; senior year; second semester; 1 credit; 1 recitation.

208. SEED TESTING. A course for students preparing themselves for positions as seed experts in Government, State, or commercial seed testing laboratories. The work accomplished by seed testing laboratories; the various methods and apparatus employed; details and operations of the pure seed laws of the different states. Most of the time of the student, however, is devoted to actual seed testing work, following the regulation Government methods and using the regulation equipment, forms, etc. Students expecting

to take this course should consult with the department of Agronomy at the beginning of their junior year, so that certain preparatory work in Agronomy and Botany may be taken prior to the course in Seed Testing.

Prerequisite: Courses in Agronomy and Botany during junior year, to be arranged by consultation.

Elective; senior year; first semester; 2 credits; 2 laboratory periods.

209. ADVANCED SEED TESTING. A continuation of the preceding course, consisting largely of actual work required in the Seed Testing laboratory to qualify the student for successful work as a seed expert.

Prerequisite: Courses in Agronomy and Botany during junior year, to be arranged by consultation.

Elective; senior year; second semester; 2 credits; 2 laboratory periods.

210. POTATO GROWING. Complete discussion of the potato crop in this country and abroad. The literature of this interesting subject is fully covered. Especial study is given to varieties, growing methods, harvesting, storing, marketing, and manufacturing, of the Oregon and Northwest potato crop. Seed selection, potato exhibiting and scoring, and potato statistics are given attention.

Elective; senior or graduate year; first semester; 1 credit; 1 recitation.

211. ADVANCED CROP WORK. In this subject, a complete study may be made of some special crop in which the student is interested, or on which information is lacking. Methods of field experimentation may be compared and carried out; or plant breeding theories and their practical use in commercial seed production may be made the subject of investigation or preparation for expert seed testing taken up.

Aside from these phases of advanced crop study, special one-hour lecture courses are offered (to groups of not less than five students) in each of the following specific subjects: Sugar Beets; Hops; Legume Seed Production.

Elective; senior or graduate year; first or second semester or both; 1 to 5 credits.

Drainage and Irrigation

301. LAND DRAINAGE. The history of drainage; road, field, and sanitary drainage on the farm; the different systems of drainage; methods of locating, installing, operating, and maintaining drainage conduits; cost, efficiency, and profits; the effect on crop and soil; laws governing. Lectures, notes, readings, and field work.

Elective; junior year; second semester; 3 credits; 2 recitation 1 laboratory period.

302. IRRIGATION FARMING. Methods of obtaining, distributing and conserving irrigation waters. Handling of different crops under irrigation. Cost and profits thereof, and duty of water in various districts of Oregon. Water rights and irrigation codes. Field and laboratory studies of irrigable quantities of different soils, laying out of irrigation systems, and field examinations, where possible, of some of the largest projects in the State.

Prerequisites: Agronomy 102 and 301.

Elective; junior or senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

303. CLIMATOLOGY. Practical meteorology; observing and recording local weather and forecasting; a study of the climate of Oregon and the effect of climate upon agriculture. Class room and laboratory work.

Elective; junior or senior year; second semester; 1 credit; 1 laboratory period.

304. ADVANCED LAND DRAINAGE. A study of drainage problems and conditions in the field. The actual surveying, laying out and draughting of plans, estimation of cost, and installation of drainage systems at different points in the State, is required of students taking this course. A complete report of the organization of a drainage district is prepared by each class.

Prerequisites: Agronomy 301 and 102, and C. E. 231 and 232

Elective; senior year; second semester; 3 credits; 1 recitation 2 laboratory periods.

305. IRRIGATION INSTITUTIONS. A brief history of the development of water laws. Riparian rights and irrigation codes in the different states, particularly in the Northwest and Oregon. Reclamation

mation and other Government and State land acts affecting irrigation development. Organization and administration of irrigation districts and projects; of water users' associations, etc.

Elective; senior year; first semester; 2 credits; 2 recitations.

306. IRRIGATION FARMING ELECTIVE. Special course for Irrigation Engineering students or other students who cannot take the regular course in Irrigation Farming the first semester. This course deals with the handling of irrigation water after it reaches the farm, and of the different crops under irrigation. The irrigable quality of different soils, the duty of water in various districts of Oregon, and water rights and irrigation codes from the standpoint of the farmer, are important features of the course.

Elective; junior or senior year; second semester; 2 credits; 2 recitations.

311. ADVANCED DRAINAGE AND IRRIGATION WORK. Under this head the student who has completed the courses offered may take up further study of special problems in either subject, such as the drainage of alkali lands, drainage against seepage, study of water table fluctuations, etc.; or field studies of the irrigation of a certain crop region, conservation of irrigation waters, effect of irrigation on soil moisture conditions, etc.

Prerequisites: Agronomy 102, 301, and 302 or 304, and C. E. 231 and 236.

Elective; senior or graduate students; either semester or both; 2 to 5 credits.

Farm Mechanics

401. FIELD MACHINERY. A detailed and comparative study of plows, harrows, rollers, packers, cultivators, seed cleaners, drills, mowers, rakes, binders, and manure spreaders. Factors having to do with the intelligent selection, use, and care of these machines are emphasized. Practical work in assembling, testing, and operating some of the more important field machines. Practice in splicing ropes, and tying useful knots and hitches.

Elective; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

402. FARM POWER MACHINERY. Special study of the gasoline engine, its construction and operation, with practice in adjusting,

testing, and trouble hunting. Feed grinding and cutting machinery pumps and hydraulic rams. Pipe fitting, babbitting, soldering, belacing, and valve grinding.

Elective; junior year; second semester; 3 credits; 1 recitation 2 laboratory periods.

403. FARM MOTORS AND TRACTORS. Study of gasoline and steam tractors. Practice in handling and operating. Gasoline tractor accessories, such as lubricators, carburetors, ignition system, etc., are especially considered, as is also valve setting on steam engines. Electricity in its adaptation to farm operations, and to threshing and pumping machinery, are given attention.

Prerequisites: Agronomy 401 and 402.

Elective; senior year; first semester; 3 credits; 1 recitation 2 laboratories.

404. FARM STRUCTURES. Farm buildings, fences, and roads. The design and construction of farm houses, barns, granaries, and silos; their arrangement and cost. The various kinds of fencing cost, construction, and quality. Road building, and maintenance and cost of same. The laboratory will include practical work in concrete construction and the rough sketching of building plans and specifications.

Elective; junior year; first semester; 2 credits; 1 recitation 1 laboratory period.

405. ORCHARD MACHINERY. The construction, proper adjustment, operation, and efficiency of the machinery most commonly used in orchard work—tillage and seeding implements, gasoline engines, spray pumps, etc. Practice work also for those that require it, in plowing, methods of hitching, etc. This is a shorter course in Farm Mechanics especially adapted to the needs of horticultural students who cannot take the regular courses in Farm Mechanics. The work is given altogether from the mechanical standpoint—not from the standpoint of the horticultural applications or uses of the various machines.

Elective; junior or senior year; second semester; 2 credits 2 laboratory periods.

406. FARM PRACTICE. A field practice course for students who have had no farm experience. All the time is spent in the field.

in actual practice work in carrying on ordinary farm operations, such as plowing and other tillage operations, seeding and harvesting work of different sorts, etc.

Elective; any year; first semester; 1 credit; 1 laboratory period.

407. FARM PRACTICE. Continuation of Course 406.

Second semester; 1 credit; 1 laboratory period.

411. ADVANCED FARM MECHANICS. For the student with inclinations toward mechanics, a wide field is offered in advanced work in testing the efficiency and cost of running various types of farm power machines and engines; or of becoming expert on harvesting machinery; or in the designing of a complete series of farm buildings or in practical work on cement construction for farm purposes, etc.

Elective; senior or graduate years; either semester or both; 2 to 5 credits.

Farm Management

501. WEED ERADICATION. A course designed for those specializing in crop production, dealing with the best farm practices of extermination of the more noxious or persistent weeds common to the United States, and particularly Oregon.

Elective; junior or senior year; first semester; 1 credit; 1 recitation.

503. SEMINAR. The preparation and discussion of papers or demonstrations on subjects of especial Agronomic interest. Inquiry into the development of different phases of the science at home and abroad. Joint fortnightly meetings, open to all agricultural students.

Junior year; second semester; 1 credit; 1 recitation.

504. SEMINAR. Senior year; second semester; 1 credit; 1 recitation.

505. FARM MANAGEMENT. A study of the various systems of extensive, intensive, and mixed farming, and the conditions under which each prospers or fails; methods of successful farmers; the application of business methods to farm operations; farm capital; farm labor; economic management of fields, work, stock, structures, crops, and machines; markets and marketing; relation of farming to other industries.

Elective; senior year; second semester; 3 credits; 3 recitations.

507. SEMI-ARID FARM MANAGEMENT. A study of the farm management problems of the dry farmer and irrigation farmer and the preparation of management plans dealing with fertility rotations, equipment, labor distribution, forms of production, marketing, etc., as adapted to semi-arid conditions. A special feature of this course, when circumstances permit, will be a field excursion into the dry farming and irrigated sections of Oregon.

Elective; senior year; second semester; 1 credit; 1 recitation.

511. ADVANCED FARM MANAGEMENT. There is a rapidly growing demand for men of special knowledge in the management of farms, or of farming areas of distinct types, where ordinary methods of crop production, crop rotations, and profit making do not suffice. In this course advanced study is made of different farming systems, or the management of special types of farming, such as dry land or irrigated areas, swamp or dyked lands, etc.

Elective; senior or graduate year; either semester or both; to 5 credits.

ANIMAL HUSBANDRY

PROFESSOR POTTER

ASSISTANT PROFESSOR KENNEDY

ASSISTANT PROFESSOR REYNOLDS (Ext.)

MR. SAMSON

MR. NELSON

The course in Animal Husbandry is planned to fit the student for the actual raising of live stock on the farm, so that he may produce the highest grade of stock in the most economical and business-like manner. The student is thoroughly grounded in the underlying principles in order that he may successfully continue his study after leaving school, but the practical details are thoroughly treated and a special effort is made to keep the student in close touch with the financial phases of the industry. Students who take this work as their specialty are not expected to devote their entire time to live stock; but, on the contrary, to familiarize themselves with crop production, soil fertility, and other phases of general Agriculture. They are expected also to study English, Economics, Commercial Law, and kindred subjects, all of which are so essential in the training of the young man who expects to

become not only an up-to-date business stockman, but a good, useful citizen.

A. STOCK JUDGING. A thorough drill in the judging of all kinds of farm animals, accompanied by textbook and lecture work on types and breeds of live stock.

First semester; 2 credits; 3 laboratory periods.

B. FEEDING AND MANAGEMENT. The practical details of the feeding, care, and management of all kinds of live stock, with special reference to practices common in the Northwest.

Second semester; 5 credits; 4 recitations; 1 laboratory period.

E. ELEMENTS OF STOCK FEEDING. This course gives the students a working knowledge of the elementary principles of stock feeding, and familiarizes them with the methods of balancing rations, with feeding standards, and with nutritive ratios.

First semester; 2 credits; 2 recitations.

1. STOCK JUDGING. The various types of farm animals are studied by score card and comparative methods, and the student is made familiar with the desirable and undesirable types of beef and dairy cattle, sheep, swine, and horses.

Freshman year; first semester; 2 credits; 3 laboratory periods.

2. LIVE STOCK MANAGEMENT. The practical details of the care and management of live stock, stabling, grooming, sanitation, practical feeding, and kindred details of live stock farming, all with especial reference to Oregon conditions.

Sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period.

6. PRINCIPLES OF BREEDING. The principles of breeding as related to the development of our domestic animals. Among the topics discussed are variation, transmission of variations and modifications, fecundity, inbreeding, crossing, and like topics.

Senior year; second semester; 3 credits; 3 recitations.

7. ANIMAL NUTRITION. The chemical and physiological principles of animal nutrition, including digestion, assimilation and metabolism; the composition of feed stuffs, and the function of the various classes of nutrients when taken into the animal body. Special attention is devoted to nutritive ratios, feeding standards, compounding rations, and the general significance of the chemical composition and energy ratio of the feeds.

Prerequisites: Chemistry 500 and 501.

Senior year; first semester; 2 credits; 2 recitations.

13. **RESEARCH WORK.** The student is expected to select some line for individual investigation, either by library methods or otherwise. The object is: first, to allow the student to study some particular subject in which he is especially interested; and, second, to give him training in working out problems for himself, such as he will have to do after leaving school. This course is open only to those who are taking Animal Husbandry as their major, or who have taken practically all of the regular courses in Animal Husbandry.

Elective; senior year; second semester; credits according to arrangement.

16. **ADVANCED STOCK JUDGING.** Practical judging of all kinds of live stock, with occasional trips to fairs and stock farms. Judging teams for the Pacific International Stock Show will be chosen from the most part from the class.

Prerequisites: At least two semesters of stock judging.

Senior year; first semester; 3 credits; 3 three-hour laboratory periods.

18. **SEMINAR.** Weekly meetings are held in which papers on Animal Husbandry subjects are read and discussed. These papers are prepared under the supervision of the department, although considerable latitude is allowed in the selection of subjects and the manner of presentation.

Junior or senior year; first semester; 1 credit.

19. **SEMINAR.** A continuation of Course 18.

Second semester; 1 credit.

21. **FEEDS AND FEEDING.** An advanced course in the feeding of horses, beef cattle, sheep, and swine, consisting of a thorough training in the most approved methods of stock feeding. Especial study is made of the practices of the best stockmen, and of the investigations carried on by the various experiment stations. Students desiring to take only such parts of the course as relate to certain lines of live stock will be permitted to do so by arrangement with the head of the department.

Prerequisite: Animal Husbandry 7.

Senior year; second semester; 5 credits; 5 recitations.

23. **FEEDS AND FEEDING.** A condensed course intended for those students who do not have the time necessary for Courses

and 21. While brief, the work is complete in itself and does not depend upon any other course. The feeding of beef cattle, sheep, hogs, and horses is studied, with reference to both principles of nutrition and farm practice.

Elective to juniors and seniors in all agricultural courses except Animal Husbandry; second semester; 3 credits; 3 recitations.

101. **LIVE STOCK PRACTICE.** A course in the details of live stock management, taking up the subject in a more advanced form than in Animal Husbandry 2. The laboratory hour will be devoted to such work as dipping, dehorning, hoof trimming, shearing, horse training, and other common operations of the stock farm.

Elective to senior Animal Husbandry students; first semester; 1 credit; 1 three-hour laboratory.

Note.—The department reserves the right to limit the number of students in this course.

102. **LIVE STOCK PRACTICE.** A continuation of Course 101.

Second semester; 1 credit; 1 three-hour laboratory.

210. **TYPES AND BREEDS OF HORSES.** A study of the leading types and breeds of both light and heavy horses, beginning with the market grades and classes, followed by the breeds. Each breed is studied with reference to its early history, the environment under which developed, the foundation stock, the men who were instrumental in establishing the breed, subsequent development, and present status. Careful consideration is given to the leading families, or strains, and the most prominent animals, both in the country at large and in the Northwest. While the work is not entirely local in its application, especial effort is made to make the students familiar with the herds and the breeders with which they will come in contact when they engage in practical work after graduation. The lecture work is accompanied by comparative judging, in which particular attention is given not merely to the general merits of the animal, but to its conformity to the type or breed in question.

Prerequisite: Animal Husbandry 1.

Junior year; first semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

220. **TYPES AND BREEDS OF BEEF CATTLE.** A study of the types and breeds of beef cattle as outlined under Course 210.

Prerequisite: Animal Husbandry 1.

Junior year; first semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

230. TYPES AND BREEDS OF SHEEP. A study of the types and breeds of sheep as outlined under Course 210.

Prerequisite: Animal Husbandry 1.

Junior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

240. TYPES AND BREEDS OF HOGS. A study of the types and breeds of hogs as outlined under Course 210.

Prerequisite: Animal Husbandry 1.

Junior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

DAIRY HUSBANDRY

PROFESSOR GRAVES

ASSISTANT PROFESSOR SIMPSON

MR. STOCKWELL

ASSISTANT PROFESSOR FITTS (Ext.)

Dairy Production and Dairy Manufacturing are the courses which the Dairy department will offer.

Dairying is rapidly becoming the leading animal industry of the United States. The last census report shows that there are more than twenty million dairy cows in the United States and the annual value of their products is approximately six hundred million dollars.

Since the population of the country is rapidly increasing, as is also the per capita consumption of dairy products, it seems likely that the importance of the Dairy Industry will continue to advance.

The Pacific Northwest, on account of its even temperature and abundant growth of forage crops, is peculiarly adapted to dairying; and the rapid growth of this industry is creating splendid opportunities for young men in the various fields of dairying, such as the breeding of pure bred dairy cattle, the management of dairy farms, and the management of creameries, cheese factories, and city milk plants. There are many other openings in government work, college work, and county advisory positions for those who do not care to enter the field of practical work.

The production and manufacturing courses are so arranged that the student may major in one course, and yet elect enough of the other course to enable him to have a working knowledge of that phase of the industry.

In the production work, it is the intention to give the student a thorough course in the breeding, feeding, judging, care, management, and diseases of dairy cattle.

In order to meet the needs of the industry and the demand for information, the department offers the following courses: A One-Year Course, designed to fit students for positions as operators of creameries and cheese factories or as managers of dairy farms. A Winter Short Course of three months in both Dairy Manufacturing and Dairy Production. The Four-Year Course, designed to qualify students for agricultural college and experiment station work; for inspectors of dairy products and dairy establishments in city, state, or government service; or as managers of creameries or large dairy farms.

A. TESTING DAIRY PRODUCTS. The testing of dairy products by the Babcock test, with special emphasis on conditions affecting the results of the test under practical conditions.

Required in one-year dairy course in Dairy Production, and in Dairy Manufacturing; first semester; 2 credits; 2 laboratory periods.

B. BUTTERMAKING AND FACTORY MANAGEMENT. The principles of creamery buttermaking; construction, management, and care of the creamery; a comparison of the various methods commonly used in the manufacture of butter in creameries.

LABORATORY. Practice in sampling and grading cream; pasteurization and ripening of cream; churning and packing butter.

Required in one-year course in Dairy Manufacturing; first semester; 4 credits; 2 lectures; 2 laboratory periods.

C. CHEESEMAKING. The commercial manufacture of cheddar cheese, covering the process in detail; a comparison of the different methods commonly employed; a study of other varieties of cheese; factory management and construction.

LABORATORY. Practice in making cheddar and other varieties of cheeses. Records are kept of the different operations to note their effect on the finished product.

Required in one-year course in Dairy Manufacturing; second semester; 4 credits; 2 lectures; 2 laboratory periods.

D. ICE CREAM. The preparation of mixes for various frozen products by different formulas; the freezing, packing, and sale of frozen products.

Required in one-year course in Dairy Manufacturing; second semester; 1 credit; 1 three-hour laboratory period.

E. CREAMERY PRACTICE. Work in the creamery, care of creamery machinery, repairing and cleaning apparatus, to familiarize the student with practical creamery work.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 2 three-hour laboratory periods.

F. CREAMERY PRACTICE. Continuation of E; second semester; 2 credits; 2 three-hour laboratory periods.

G. ADVANCED TESTING. Advanced work in the use of the Babcock test. Short cuts and conveniences for rapid and efficient testing; rapid tests for adulterants and preservatives; curd, acidity, and sediment tests.

Required in one-year course in Dairy Manufacturing; first semester; 1 credit; 1 three-hour laboratory period.

H. BUTTER AND CHEESE JUDGING. Judging butter and cheese with score card; discussion of the defects of body and flavor.

Required in one-year course in Dairy Manufacturing; first semester; 1 credit; 1 three-hour laboratory period.

I. BUTTER AND CHEESE JUDGING. Continuation of H; second semester; 1 credit; 1 three-hour laboratory period.

J. BREEDING, FEEDING, AND MANAGEMENT OF DAIRY CATTLE. The history and development of the dairy breeds; a study of the breeding of the principal families of the various breeds; the selection and use of the pure bred dairy sire in grading up the herd; the practice of inbreeding, linebreeding, and crossbreeding in improving dairy cattle. Feeding dairy cattle for economical milk production; feeding for records; developing the dairy calf; developing the dairy heifer; care of the dairy herd; care of the cow at time of parturition; methods of testing and record keeping; care and handling of the bull; the organization and purpose of cow testing, bull and community breeders' associations; the construction of dairy barns, milk houses, manure sheds, and silos; practical problems.

Required in one-year course in Dairy Production; first semester; 2 credits; 2 lectures.

K. BREEDING, FEEDING, AND MANAGEMENT OF DAIRY CATTLE. Continuation of J; second semester; 2 credits; 2 lectures.

L. JUDGING DAIRY CATTLE. Scoring animals by breeds and general score cards and placing classes of animals.

Required in one-year course in Dairy Production; first semester; 1 credit; 1 laboratory period.

M. JUDGING DAIRY CATTLE. Continuation of L; second semester; 1 credit; 1 laboratory period.

N. DAIRY PRACTICE. Practice in computing and mixing rations; tracing and compiling extended pedigrees; fitting animals for the show ring.

Required in one-year course in Dairy Production; first semester; 1 credit; 1 three-hour laboratory period.

O. DAIRY PRACTICE. Continuation of N; second semester; 1 credit; 1 three-hour laboratory period.

1. ELEMENTS OF DAIRYING. The secretion and composition of milk, and the causes of variation in composition; brief discussion of dairy cattle, and the factors in milk production; the Babcock test applied to milk and other products; use of the lactometer; the various methods of creaming; the operation of cream separators; the care of milk and cream; making butter under farm conditions. The general principles of cheesemaking; marketing of milk; dairy by-products; statistics and economics of the dairy industry.

LABORATORY. The use of the Babcock test applied to milk and dairy products, with special attention to conditions that may affect the accuracy of tests; use of the lactometer; churning and working butter; a study of the construction, operation, and efficiency of various makes of cream separators; practice in ascertaining the yield of milk and fat, and the cost of production of cows in the College herd.

Required in all courses in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period.

2. DAIRY HERD MANAGEMENT AND MILK PRODUCTION. Form and its relation to production; difference in the efficiency of dairy cows; improvement of dairy herds; methods of testing and record keeping; the use and importance of the pure bred dairy sire in

grading up the herd. *Care of the Dairy Herd*: care of the cow at time of parturition; the dairy calf and its successful development developing the dairy heifer; care of the bull; feeding for economical milk production and for records. Registered dairy cattle and their management, fitting for the show ring, advertising cattle, and sales. *Dairy Farm Economics*: the preservation and saving of manure; labor; crop systems for the dairy farm, soiling, pasturing feeds; silage crops and the making of silage; the organization and purpose of cow testing, bull, and community breeders' associations. *Milk Production*: the production of market and certified milk sources of infection and contamination of milk; the effect of different kinds of feed on flavor and healthfulness of milk; pasteurization of milk; contracts between milk companies and drivers.

LABORATORY. Judging dairy cattle; scoring animals by breed and general score cards and judging classes of animals. Animals of the College herd will be used; and trips to local dairies, and an annual trip to prominent dairy farms in the Willamette Valley will be taken by College classes.

Required in courses in Dairy Production and Dairy Manufacturing; junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods. Text: Eckles' Dairy Cattle and Milk Production

3. BUTTERMAKING AND FACTORY MANAGEMENT. The composition of milk and cream; the effects of condition of milk and cream on the quality and yield of butter; pasteurization; starters; ripening and churning cream; packing and marketing butter. The location, organization, and construction of creameries; creamery refrigeration and management; creamery accounting; and other studies designed to fit the student to manage and operate creameries.

LABORATORY. Practice in sampling and grading cream; pasteurization and ripening of cream; the use of starters; churning, with special attention to factors that control the composition of butter; packing and wrapping butter; the use of the acidity, moisture, and salt tests.

Prerequisites: Dairy Husbandry 1, Bacteriology 101.

Required in courses in Dairy Production; senior year; second semester; in course in Dairy Manufacturing; junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods.

4. **CHEESEMAKING.** The importance of quality and composition of milk in the manufacture of cheddar cheese; composition and characteristics of common American and European cheeses; ferments and fermentations and their control; factory management and construction; the making of cheddar cheese and some forms of soft cheeses.

LABORATORY. Practice work in receiving and sampling milk; the use of the various tests for acidity, ferments, fats, solids, and casein; the making and curing of cheddar and other varieties of cheeses; the computation of yields, cost of manufacture, and profit; the effect of different methods of manufacture on yield and quality.

Prerequisites: Dairy Husbandry 1, Chemistry 502.

Required in course in Dairy Manufacturing; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Text: Principles and Practice of Cheesemaking, by Van Slyke and Publow.

5. **BREEDS AND BREEDING OF DAIRY CATTLE.** The origin, history, and development of breeds of dairy cattle, their distribution and their characteristics. A study of the breeding of the principal families of the various breeds. Application of the principles of Genetics to the breeding of dairy cattle.

LABORATORY. Practice in the use of the breed herd books in tracing and making pedigrees. A study of methods of registering animals and advanced registry systems.

Required in courses in Dairy Production and in Dairy Manufacturing; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

6. **DAIRY INSPECTION AND DAIRY FARM EQUIPMENT.** A. Application of Babcock test; use of the lactometer in detecting adulterations; rapid tests for various preservatives and methods of detecting adulterations; moisture, acidity, salt, curd, casein, and sediment tests; the score card system of dairy inspection; study of federal, state, and city laws governing the production and sale of dairy products; city milk inspection. B. Arrangement, construction, and equipment of dairy barns, milk houses, milk bottling plants, silos, manure sheds, covered exercise sheds, ice houses, and in planning and laying out dairy plants for special purposes.

Prerequisite: General Bacteriology.

Required in courses in Dairy Production and Dairy Manufacturing; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Text: Farrington and Woll's Testing Milk and Its Products.

7. ICE CREAMS AND ICES. A study of the preparation, packing, and marketing of ice creams, sherbets, and related frozen products.

LABORATORY. Practice in selecting and aging of cream for ice cream; standardizing and preparing the mix for the various frozen products; the freezing, packing, bricking, molding, coloring, and sale of the various frozen products; judging ice cream and related frozen products by the score card.

Required in course in Dairy Manufacturing; senior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

8. SEMINAR. The study and review of new experiment station bulletins, and general dairy periodicals and literature. Papers are presented by the student on dairy subjects. Practice in outlining investigational work is given.

Required of all seniors and advanced students majoring in Dairy Production and Dairy Manufacturing; senior year; second semester; 1 credit.

9. BUTTER AND CHEESE JUDGING. Judging of butter and cheese with score cards; discussion of defects of body and flavor.

Required in course in Dairy Manufacturing; senior year; second semester; 1 credit; 1 three-hour laboratory period.

10. ADVANCED JUDGING. Practice in judging dairy animals. This work, which includes trips to fairs and breeders' farms, is especially for those who desire to try for the Dairy Judging Team.

Elective; senior year; first semester; 1 credit; 2 two-hour laboratory periods.

HORTICULTURE

PROFESSOR LEWIS
ASSOCIATE PROFESSOR GARDNER
ASSOCIATE PROFESSOR PECK
ASSOCIATE PROFESSOR KRAUS
ASSISTANT PROFESSOR BOUQUET
ASSISTANT PROFESSOR BROWN (Ext.)
MR. BROWN
MR. BRADFORD
MR. TUFTS
MR. WOODMAN
MR. BARSS
MR. MARSHALL
MR. MAGNESS
MR. MASTERTON.

The scope of the work in Horticulture is very broad, giving instruction in Pomology, Olericulture, Floriculture, Landscape Gardening, and School Gardening. In these courses the student is first thoroughly grounded in the fundamentals, and is then allowed to specialize as he may desire. Thus, he may fit himself for station or government work, or prepare for the many lines in horticultural business, such as fruit growing, truck gardening, floriculture, or landscape gardening; for in all these lines there are splendid opportunities throughout the Pacific Northwest. At the present time there are openings for young men to become managers of orchards or to develop fruit lands for outside investors; those having a taste for teaching, can find a broad field in college or rural work or as supervisors of horticulture.

The required work for students electing horticulture covers a wide range, giving the student a thorough training, not only in plant propagation and the general principles of orchard management and vegetable growing, but in floriculture and landscape gardening as well, thus broadening his views and interesting him in the aesthetic and all that pertains to more beautiful surroundings.

The courses consist of lectures, reference reading, field exercises, and laboratory work. Much stress is placed upon the practical phases of all the work. In all courses horticultural truths are illustrated by practice, whenever possible. Students are given field and

laboratory exercises in all such operations as planting, seeding, budding, grafting, cultivating, thinning, pruning, harvesting, and spraying.

The Horticultural Building contains modern laboratories for spraying, plant propagation, fruit packing, systematic pomology and vegetable preparation. There are special class rooms, large draughting rooms, museum, and research laboratories. A new floriculture building and range of greenhouses assist materially in the work. The department is also establishing young orchards and vegetable gardens, and has at its disposal a large campus upon which are planted many species of trees and shrubs. The student is materially assisted in all of his work, and the research work especially, by the large additions that have recently been made to the horticultural library.

A. HORTICULTURAL PRACTICE. Practical fruit growing, dealing with such subjects as the choice of locations, sites, soils, and varieties; the establishment of orchards, including staking, setting trees; the maintenance of the orchard, including such topics as tillage, maintaining orchard fertility, thinning, pruning, spraying; the propagation of the principal fruits, and the study of the most common methods of budding and grafting; handling the fruit crop, including picking and packing.

One-year course in Agriculture; first semester; 5 credits; 3 recitations; 2 laboratory periods.

B. HORTICULTURAL PRACTICE. Continuation of course A. The greater part of the work, however, will be devoted to vegetable gardening and landscape gardening. The first part of the semester will be devoted to a fundamental study of vegetable gardening, and will deal with such problems as the choice of soils and locations; production of plants, including problems connected with the use of manures and fertilizers, irrigation, tillage, etc.; the harvesting and market preparation and disposal of vegetable products. The latter part of the semester will be devoted to a fundamental study of landscape gardening; and will deal with the fundamental principles and their application in beautifying the farm home.

One-year course in Agriculture; second semester; 5 credits; 3 recitations; 2 laboratory periods.

101. PRINCIPLES OF FRUIT GROWING. The problems incident to the establishing of an orchard. It includes a consideration of such

questions as location, site, soils, windbreaks, variety selection, selection of nursery stock, and planting. Some attention is also given to problems incident to maintenance, especially the maintenance of the home orchard. It is designed especially for general agricultural students who are interested mainly in the orchard as an accessory of the general farm. At the same time, it is a fundamental course for students desiring to pursue other horticultural studies. The study of the principles of fruit growing will cease with the Christmas holidays, and the remainder of the semester will be devoted to landscape gardening. A series of lectures and laboratory practicums will be given on the beautifying of the farm home and rural public buildings.

Required of all Agricultural students; sophomore year; first semester; 3 credits; 3 recitations; 1 laboratory period.

Pomology

102. PRACTICAL POMOLOGY. A continuation of course 101. It deals especially with the problems incident to the maintenance of the commercial orchard, including a study of such questions as cover crops, fertilization, irrigation, frost occurrence and prevention, pollination, pruning, thinning, spraying, and spray injury.

Required of students majoring in Pomology; junior year; first semester; 2 credits; 3 recitations.

103. ORCHARD PRACTICE. A laboratory course in which the student obtains actual practice in regular orchard and packing house operations. The work includes tree planting, pruning, the preparation of spray solutions, a study of spray machinery, orchard spraying, orchard heating, and the picking, grading, packing, and judging of fruits.

This course is open only to those who have taken or are taking course 102.

Required of juniors majoring in Pomology; junior year; first semester; 2 credits; 1 laboratory period of four hours scheduled for Saturday forenoons.

104. ORCHARD PRACTICE. A continuation of course 103.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 laboratory period of four hours, scheduled for Saturday forenoons.

105. PLANT PROPAGATION. A study of the propagation of plants by means of seeds, separation, and division, layerage, cuttage and graftage. Sufficient attention is given the subject of nursery management to acquaint the student with its more important features.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 recitation; 2 laboratory periods.

109. VITICULTURE. A study of the problems pertaining to the growing, harvesting, and marketing of both the American and European types of grapes. Soils, locations, pruning, training, harvesting, grading, packing, storage, etc., are some of the questions receiving attention.

Elective; open to juniors and seniors; second semester; alternate years; 2 credits; 2 recitations.

111. SMALL FRUIT CULTURE. A study is made of the problems connected with the growing, harvesting, and marketing of such fruits as the strawberry, currant, gooseberry, raspberry, blackberry, loganberry, and cranberry.

Elective; open to juniors and seniors; second semester; 2 credits; 2 recitations.

113. NUT CULTURE. A study of the methods of growing, harvesting, curing, and marketing such nut crops as the walnut, filbert, almond, and pecan. In the laboratory a detailed study is made of the leading varieties of these different nuts.

Elective; open to juniors and seniors; second semester; alternate years (not given in 1915); 2 credits; 1 recitation; 1 laboratory period.

115. SYSTEMATIC POMOLOGY. A study of the principles underlying pomological nomenclature and variety description, classification, and adaptation. A critical study is made of many varieties of fruits, of the influence of environment upon behavior of fruit trees and the development of their products. The student becomes acquainted with the more important fruit groups and their interrelationships.

Required of seniors majoring in Pomology; senior year; first semester; 4 credits; 2 recitations; 3 laboratory periods.

117. COMMERCIAL POMOLOGY. The problems of handling fruit, including the picking and grading and packing of fruits; a study of the problems of transportation, storage, distribution, and market-

ing. Considerable attention will also be given to the planning of buildings for the packing and storing of fruit.

Required of seniors electing Pomology as a major; senior year; second semester; 2 credits; 2 recitations.

119. SUB-TROPICAL POMOLOGY. This course takes up in detail the problems concerned with the growing and marketing of such sub-tropical fruits as oranges, figs, olives, pineapples, etc.

Elective; senior year; first semester, 2 credits; 2 recitations.

121. ADVANCED POMOLOGY. A finishing course in pomology. The students will first be given a general review to determine their knowledge of pomology. The course is designed especially to fit students for Civil Service examinations. The latter part of the course will be devoted to the study of some advanced problems in pomology, and will also include a study of orchard costs and economics, the cost of production, and marketing.

Elective; senior year; second semester; 3 credits; 3 recitations.

123. SEMINAR. A course especially arranged for senior and graduate students in Horticulture. A study is made of some of the advanced problems. Articles from the leading magazines on horticultural subjects, as well as station and Government publications, are reviewed.

Required of Agricultural seniors and advanced students having their major in Horticulture; senior year; first semester; 1 credit; 1 two-hour recitation.

124. SEMINAR. A continuation of course 123.

Prerequisite: Course 123.

Required of seniors electing Pomology as a major; senior year; second semester; 1 credit; 1 two-hour recitation.

125. HISTORY AND LITERATURE OF HORTICULTURE. A study is made of the literature and history of Horticulture from the time of the Egyptians to modern times.

Required of seniors electing Pomology as a major; senior year; second semester; 2 credits; 2 recitations.

127. PLANT BREEDING. The principles of breeding. A study of some of the facts pertaining to variation, classification of variations, causes of variation, and the theories that have been advanced to explain the inheritance of characters. The class room work will

consist of lectures, reference readings, and recitations; the laboratory work will acquaint the student with statistical methods of studying variation; and through greenhouse experiments he will become acquainted with some of the ways in which environment influences plant growth.

Elective; open to seniors and graduate students (and to juniors by special permission); first semester; 3 credits; 3 recitations; 1 laboratory period.

128. PLANT BREEDING. A continuation of course 127. A study of breeding systems and recent breeding work. For the laboratory work, each student will be assigned to some problem that will give him a knowledge of the technique involved in plant breeding studies, and of the methods that are employed in plant breeding investigations.

Elective; open to seniors and graduate students (or to juniors by special permission); second semester; 3 credits; 2 recitations; 2 laboratory periods.

Vegetable Gardening

Students taking their major in this course are required to take Horticulture 301 and 401.

201. VEGETABLE GROWING. This course is offered for the purpose of teaching the student the value of a well conducted farm or home vegetable garden, serving especially those students who cannot further pursue a horticultural course. At the same time, the work will be fundamental in the instruction of higher courses in commercial vegetable growing and marketing, for those students who desire to pursue work in this branch of Horticulture.

Required; sophomore year; second semester; 2 credits; 1 lecture; 1 laboratory period.

203. PRACTICAL VEGETABLE GARDENING. This course is offered to those students wishing to learn the fundamentals of the business of vegetable gardening. The practices of the leading commercial growers in all phases of field management will be studied, including such problems as vegetable soils, locations, production of plants, distribution of crops, successions, rotations, manures and fertilizers, irrigation, implements, capital, labor, and other vital factors in the management of a commercial vegetable farm.

Required of juniors electing Vegetable Gardening as a major; junior year; first semester; 2 credits; 1 lecture; 1 laboratory period.

204. PRACTICAL VEGETABLE GARDENING. A continuation of the above course, designed especially for those who are specializing in vegetable growing. Course 204 offers work dealing with the methods used in the commercial production of vegetables for market, consisting largely of practicums in field and greenhouse so as thoroughly to acquaint the student with proper methods and management. The commercial testing grounds, trips to vegetable farms, and the College greenhouses give ample opportunities for the student to fit himself for later commercial work.

Required of juniors electing Vegetable Gardening as a major; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

205. FORCING VEGETABLES. The problems connected with the forcing of such vegetables as lettuce, cucumbers, tomatoes, rhubarb, and melons, in cold frames, hotbeds, and greenhouses. Lectures and exercises in the greenhouses.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 2 credits; 1 lecture; 1 laboratory period.

206. FORCING VEGETABLES. Continuation of course 205.

Prerequisite: Horticulture 205.

Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

207. SYSTEMATIC OLERICULTURE. Description, nomenclature, and classification of vegetables. Exercises are given in displaying and judging vegetables.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 1 credit; 1 laboratory period.

209. COMMERCIAL TRUCK GARDENING. Only the purely commercial aspects of market gardening and trucking are offered in this course. Problems of growers in the production of vegetables on an extensive scale for market and cannery will be considered. Students will be fitted by this course for extensive or intensive operations, and for managerial positions. Particular attention will

be paid to modern methods of marketing vegetables; and the economics of producing vegetable crops will be treated in lectures and discussions.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

210. COMMERCIAL TRUCK GARDENING. A continuation of Course 209.

Prerequisite: Horticulture 209.

Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Landscape Gardening

301. LANDSCAPE GARDENING. All students should be interested in everything that pertains to the decoration of the home, the improvement of school grounds, the beautifying of streets, and the establishment of recreation grounds and parks. In the course in Landscape Gardening the general principles of this art are so treated as to apply to the up-building of the aesthetic in everyday life.

Required of Agricultural juniors electing Horticulture as a major; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

303. TREE SURGERY. The principles of tree surgery are presented and put into execution in the laboratory. All the varying cuts, cavities, fillings, bracing, and cultivating will be worked out in a practical manner.

Elective; junior year; first semester; 1 credit; 1 laboratory period.

304. TREE SURGERY. A continuation of Course 303.

Elective; junior year; second semester; 1 credit; 1 laboratory period.

305. PLANT MATERIALS. To create satisfactory landscape effects, one must have a broad knowledge of the materials with which landscape architects must work. A thorough study is given to trees, both evergreen and deciduous, shrubs, vines, perennial herb-

aceous plants, biennials and annuals, with a view to bringing out their characteristics, such as foliage, color, form, adaptation, hardness, and artistic effect.

Prerequisite: Horticulture 301.

Elective; junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

306. PLANT MATERIALS. A continuation of Course 305.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

307. THEORY AND DESIGN. A study of the best works of prominent landscape architects, together with a wide range of collateral reading bearing upon the various problems. Private estates, public parks and play grounds, boulevards, and cemeteries will be carefully studied. Reports, such as those of park boards and landscape architects, will also be studied.

Prerequisites: Horticulture 301, 305, 306.

Elective; senior year; first semester; 2 credits; 2 laboratory periods.

308. THEORY AND DESIGN. A continuation of Course 307, in which a large portion of the time will be devoted to the preparation of planting plans. Outside time will be required for collateral reading.

Prerequisites: Horticulture 301, 305, 306, 307.

Elective; senior year; second semester; 3 credits; 3 laboratory periods.

309. FIELD PRACTICE. A course in practical problems brought in from the field of practice. The student is required to make the surveys, do the engineering work incidental to the solving of the problem, make general plans, planting plans, grading plans, details, and, in short, perform all the duties ordinarily met with in the landscape architect's office.

Prerequisites: Horticulture 301, 305, 306. Civil Engineering required in freshman and sophomore year.

Elective; senior year; first semester; 3 credits; 3 laboratory periods.

310. FIELD PRACTICE. A continuation of Course 309.

Prerequisites: Horticulture 301, 305, 306, 309. Civil Engineering required in freshman and sophomore year.

Elective; senior year; second semester; 3 credits; 3 laboratory periods.

311. HISTORY AND LITERATURE OF LANDSCAPE ARCHITECTURE

Designed to give the student a good idea of the development of the art, and to bring him into close touch with the literature, past and current, that is related to the subject.

Elective; senior year; second semester; 2 credits; 2 recitations.

313. TOWN PLANNING. This course is offered in order that the student may understand, in a general way, the underlying ideas of municipal, town, and village improvement. Literature and reports are studied, town problems discussed, and methods of procedure in town improvement worked out.

Elective; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Floriculture

Students taking their major in Floriculture are required to take Horticulture 301 and 401.

401. FLORICULTURE. An elementary course in the cultivation of greenhouse and home plants and of the common annuals and perennials used in outdoor work. The course is designed to broaden the views of those students who are unable to take advanced courses in Floriculture, and to make them more useful citizens.

Required of Agricultural juniors electing Horticulture as a major; first semester; 2 credits; 1 recitation; 1 laboratory period.

403. GREENHOUSE CONSTRUCTION. A course particularly adapted for students specializing in Floriculture and Truck Gardening. The problems connected with the building of greenhouses, hotbeds, and cold frames are dealt with; also the selection of materials; the various systems of heating and ventilating, and the value of the various types of buildings. Lectures and laboratory exercises in greenhouse and draughting room are conducted.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

405. **FORCING FLOWERS.** The propagation and problems of culture; such as soils, ventilation, and heat, connected with the forcing of plants used in the florist's trade.

Prerequisite: Horticulture 401.

Elective; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

406. **FORCING FLOWERS.** A continuation of Horticulture 405.

Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

501. **FLORICULTURE.** As related to the cultivation of the common household and dooryard flowers, instruction is given in various subjects; namely, proper soils, planting of seed, transplanting, making of cuttings, cultivation, principles of heating and ventilating and control of insect pests and diseases. In addition, such problems as the grouping and arranging of flowers, so as to obtain the best color harmonies and most pleasing effects while growing, as well as for decoration purposes, are included. The lectures are supplemented by reference readings and laboratory periods in the greenhouse and garden.

Course in Home Economics; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

503. **LANDSCAPE GARDENING.** The general principles of Landscape Gardening are taught, the aim being to give the student sufficient foundation to understand landscape gardening as applied to home decoration; to interest the student in the home beautiful; and the improvement of our public school grounds and city and village streets. A study is made of photographs, and of famous landscape paintings, showing good taste and design in various phases of Landscape Gardening. Lectures and reference readings are supplemented by field exercises.

Course in Home Economics; second semester; 2 credits; 1 recitation; 1 laboratory period.

505. **VEGETABLE GARDENING AND SMALL FRUIT CULTURE.** Care of soil, seeding, rotation, fertilizing, and the selection of the best varieties of vegetables and small fruits for use in the home garden. Lectures, laboratory, and field exercises.

Course in Home Economics; second semester; 3 credits; 2 recitations; 1 laboratory period.

By-Products

601. **HORTICULTURAL BY-PRODUCTS.** A general study of horticultural by-products, including a study of the growth and development of this important industry in this country and abroad, but more especially in the Pacific Northwest. In addition, the course will deal with the establishment of plants, their operation, and the fundamental principles connected with canning, evaporating, drying, and the manufacture of fruit juices.

Elective; junior or senior year; first semester; 1 credit; 1 recitation.

603. **DRIED PRODUCTS.** A detailed study of the evaporation and drying of fruits and vegetables. It will include a study of the types of buildings now used, and of the machinery and apparatus needed in the successful operation of the various types of driers. This course will also deal with the technique connected with the evaporation and drying and processing of such products as apples, pears, peaches, apricots, berries, and vegetables.

Elective; junior or senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Not offered in 1914-15.

605. **CANNING.** A study of the establishment, management, and operation of canneries, including a study of necessary buildings, machinery, and the successful operation of canneries. It will also include a detailed study of the various methods used in canning, and in the manufacture of syrups, jellies, etc.

Elective; junior or senior year; second semester; three credits; one recitation; two laboratory periods. Not offered in 1914-15.

607. **FRUIT JUICES.** A study of the manufacture of cider, vinegars, and juices of such fruits as the apple, grape, and Loganberry. A study will be made of various types of buildings and machinery suitable for the manufacture of such juices, together with the study of the best methods embraced in the manufacture of fruit syrups and juices.

Elective; junior or senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Not offered in 1914-15.

Research

The department of Horticulture is unusually well equipped for offering research work. In addition to the laboratory facilities, there are the greenhouses, experimental plots, and a splendid research library, well supplied with scientific books and periodicals, all combining to give the student unsurpassed facilities.

701. RESEARCH WORK FOR SENIORS. This course is offered for those seniors who are contemplating following college, experiment station, or Government work as a life career, or for those students who desire to have some special training in research technique. Problems will be assigned to the students which will give them experience in the laboratory, greenhouse, field, and library.

Elective; senior year; first semester; 3 credits.

702. RESEARCH WORK FOR SENIORS. A continuation of Course 701.

Elective; senior year; second semester; 3 credits.

703. ADVANCED THESIS AND RESEARCH WORK. A course offered only for graduate students. Such students will be allowed to select problems in pomology, vegetable gardening, landscape gardening, floriculture, plant breeding, and the like.

Elective; for graduate students only; first semester; from 10 to 20 credits.

704. ADVANCED THESIS AND RESEARCH WORK. A continuation of Course 703.

Elective; for graduate students only; second semester; from 10 to 20 credits.

705. METHODS OF RESEARCH. This course is offered to graduate or senior students interested in research work. It will be conducted as a research round table. Special drill will be given in the making of briefs and outlines of research problems, in methods of procedure in conducting investigative work, and in the preparation of bulletins and reports. The study of research problems conducted by the department of Horticulture will be taken up, and a close study made of the research work which is presented in bulletins from other institutions.

Elective; senior or graduate students; first semester; 1 credit.

706. METHODS OF RESEARCH. Continuation of Course 705.

Elective; senior or graduate students; second semester; 1 credit.

POULTRY HUSBANDRY

PROFESSOR DRYDEN

ASSISTANT PROFESSOR LUNN

MISS NIXON

In recognition of the importance of the poultry industry, and to meet the demands of students who aim to give special attention to this industry after leaving college, the department of Poultry Husbandry was established. Poultry keeping is a part of every well regulated system of diversified farming, and at the same time offers opportunity for profit-making as a special business under special conditions. The two poultry plants at the College give exceptional opportunities for study of the practical as well as the theoretical side of the poultry industry.

A. **POULTRY HUSBANDRY OPTIONAL COURSE.** To meet the demands of those who are unable to take up the degree course, a one-year course has been arranged. The course will be thoroughly practical, and the student will be required to do work pertaining to the various branches of poultry keeping, which will be supplemented with lectures and recitations in the class room.

One-year course in Agriculture; first semester; 5 credits.

B. A continuation of Course A; second semester; 5 credits.

1. **POULTRY HUSBANDRY.** Includes a study of breeds of domestic poultry, their history, and classification. Laying and market qualities of different breeds are emphasized. Breeding fowls for different purposes will be considered, as will the location and construction of the poultry plant and its equipment. Laboratory work consists of practice in judging; preparing poultry products for market; construction of houses, coops, poultry plant equipment; and drawing of plans.

Required of all juniors in Poultry Husbandry; junior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

2. **POULTRY HUSBANDRY.** A continuation of Course 1, but may be taken separately. Includes a study of poultry feeds and feeding with reference to egg and meat production. Reproduction by natural and artificial methods. Markets and marketing. Laboratory work consists of a study of poultry food stuffs and rations. Students will be given practice in preparing different rations. Prac-

tice will also be given in hatching and brooding. Each student will have charge of a pen of fowls, and during his period of management will do all the feeding and keeping of records.

Required of all juniors in Poultry Husbandry; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

3. **ADVANCED POULTRY HUSBANDRY.** For students specializing in Poultry Husbandry advanced work will be given in the senior year. The work of this course consists of a study of poultry literature, conducting experiments, and writing up results.

Prerequisites: Poultry Husbandry 1, 2.

Required of all seniors in Poultry Husbandry; senior year; first semester; 4 credits.

4. **ADVANCED POULTRY HUSBANDRY.** A continuation of Course 3, together with assignments of special and original problems. Successfully to complete the advanced work will mean that the student has demonstrated his ability to lay out and manage a poultry farm; or to fill a college or station position in Poultry Husbandry. There is a growing demand for specialists along these lines.

Prerequisites: Poultry Husbandry 1, 2, 3.

Required of all seniors in Poultry Husbandry; senior year; second semester; 6 credits.

6. **PRACTICAL POULTRY KEEPING.** A course arranged to meet the demands of students who desire a knowledge of practical poultry keeping, but who are unable to elect a full year's course. The course includes the selection of stock; breeding farm poultry; poultry house and equipment; methods of reproducing the flock; feeds and feeding; as well as markets and preparation of poultry products for market.

Optional for sophomores in Agriculture; 2 credits; 2 lectures or recitations.

7. **MARKETS AND MARKETING.** Arranged for advanced study of poultry market conditions and the marketing of poultry and poultry products. Lectures or recitations consist of a study of available data and reports on original work. The laboratory course will supplement the work taken up in lecture and recitations. Students are required to do practical work, such as preparing poultry products for market, fattening, killing, dressing, and marketing fowls; and when possible, they will be in charge of actual marketing.

Elective; required of all juniors in Poultry Husbandry; first semester; 2 credits; 1 lecture or recitation; 1 laboratory period.

10. FEEDS AND FEEDING. A study of feeds and feeding related to the different branches of poultry keeping. Lectures or recitations consist of a study of food stuffs, their composition, etc., used in poultry feeding; also methods of feeding chickens of different ages and the feeding of chickens for different purposes. Laboratory work consists of a study of the various food mixtures and practice in mixing various rations.

Elective; required of all juniors in Poultry Husbandry; second semester; 2 credits; 1 lecture or recitation; 1 laboratory period.

11. POULTRY DISEASES. Elective; required of all seniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 2 laboratory periods.

12. ANATOMY OF THE FOWL. (Vet. Med. 11.) Elective; required of all juniors in Poultry Husbandry; 1 lecture or recitation; 1 laboratory period.

VETERINARY MEDICINE

PROFESSOR SIMMS

The object of the courses in veterinary medicine is to prepare the students to recognize disease, treat emergency cases, diagnose and control outbreaks of infectious diseases, and take care of sick animals.

1. COMPARATIVE ANATOMY. Anatomy is taught in the most practical manner possible. Special attention is paid to the digestive systems of the horse and the cow; to the foot, the muscles of locomotion, and the teeth of the horse. The laboratory work includes complete dissection of the digestive, urinary, genital, and respiratory systems, and partial dissection of the circulatory, muscular, and nervous systems.

Junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

2. COMPARATIVE PHYSIOLOGY. The study of the functions of the body. Special attention is paid to the digestive system. The physiological processes of all the domestic animals are studied, with special emphasis on the horse and the cow. The laboratory work consists of practical experiments which are correlated with the lectures.

Junior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

3. DISEASES OF LIVE STOCK. The parasitic, infectious, and non-infectious diseases of domestic animals are considered in this course. Special attention is given to the prevention and control of parasitic and infectious diseases. The laboratory work consists of a free clinic, which provides an abundance of both medical and surgical work. The students assist in handling and diagnosing the medical cases, and in operating on the surgical cases. They also observe the results of treatment of all animals in the hospital.

Senior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

4. DISEASES OF LIVE STOCK. A continuation of course 3.

Senior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

5. VETERINARY HISTOLOGY. The histology of the domestic animals.

Elective; senior year; first semester; credits to be arranged.

6. VETERINARY HISTOLOGY. A continuation of Course 5.

Elective; senior year; second semester; credits to be arranged.

11. ANATOMY OF THE FOWL. A study of the structure of the body of the fowl. The laboratory work consists principally of dissection.

Junior or senior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

12. POULTRY DISEASES. The parasitic, infectious, and non-infectious diseases are considered. Special emphasis is placed upon methods of prevention and control of parasitic and infectious diseases. Students observe autopsies, methods of diagnosis, and treatment of fowls.

Junior or senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

14. DISEASES OF LIVE STOCK. A one-semester course for Agronomy students. The more common diseases, with the methods of prevention and control, are considered. The laboratory work consists of a free clinic, which provides an abundance of animals for both surgical and medical treatment.

Junior or senior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

15. DISEASES OF DOMESTIC ANIMALS. A practical course given to the Animal Husbandry students who are taking the one-year course. The laboratory work consists of a free clinic, which provides an abundance of animals for treatment.

One-year students; first semester; 3 credits; 2 recitations; 1 laboratory period.

17. DISEASES OF DAIRY CATTLE. A practical course given to the Dairy Husbandry students who are taking the one-year course.

One-year students; first semester; 2 credits; 2 recitations.

18. DISEASES OF DAIRY CATTLE. A continuation of Course 17. The laboratory work consists of a free clinic. The students observe methods of diagnosis and treatment of both medical and surgical cases.

One-year students; second semester; 2 credits; 1 lecture; 1 laboratory period.

BACTERIOLOGY

PROFESSOR BECKWITH

ASSISTANT PROFESSOR VASS

MR. HORTON

MR. CURTIS

The relationships of the comparatively new science of Bacteriology to everyday life in the various industries have increased so largely in numbers and intimacy that it is necessary for any student properly equipped in Dairying, Agriculture, Agronomy, Pharmacy, Domestic Science, etc., to have a working knowledge of the subject.

As in any well-rounded subject, effort is in two directions which are closely associated, theory and practice. It is impossible for a student intelligently to carry out operations unless he understands the fundamental underlying theories.

The courses are so arranged in the department of Bacteriology that a student may take thorough preparation in the subject in a specific line, such as Pharmacy, Domestic Science, Agronomy, Sanitation, etc. This, in turn, if desired, may be followed by special research problems and advanced work.

In addition to the work outlined below, a series of lectures will be given to students in Forestry on the subject of Camp Sanitation.

406. DAIRY VOCATIONAL BACTERIOLOGY. This course is given for the benefit of students taking the vocational course in Dairying. All matter presented is given from the most practical standpoint. The work to be included consists of consideration of the various kinds of contaminating organisms found in milk and their source, simple methods of control, bacteria in relation to milk inspection, methods of propagation of starters, and general methods for bacteriological examination of dairy products.

Vocational course in dairying; second semester; 2 credits; 1 lecture; 2 laboratory periods.

101. ELEMENTARY BACTERIOLOGY. A series of lectures, experiments, and recitations to familiarize students with the underlying principles of bacteriology as applied to everyday life; and as an introduction to the more advanced courses in this subject.

The course in Agriculture; sophomore year, or Commerce, first year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

102. ELEMENTARY LABORATORY BACTERIOLOGY. A course given for the purpose of supplementing the lecture and laboratory work of Bacteriology 101, to those who care to take it.

Prerequisite: Bacteriology 101.

Elective; junior year; second semester; 2 credits; 2 laboratory periods.

111. GENERAL BACTERIOLOGY. Beginning with the first semester of the junior year, a student may take bacteriology through the two semesters of that year, then continue advanced work through the two semesters of the senior year.

Elective; junior year; first semester; 4 credits; 1 lecture; 1 recitation period; 3 laboratory periods.

112. ADVANCED BACTERIOLOGY. A continuation of course 111, the laboratory work familiarizing the student with special bacteriological apparatus and its use, then gradually proceeding into advanced work involving questions of pure science, as well as the application of bacteriology to the professions and industries.

Elective; junior year; second semester; 4 credits; lectures; laboratory work.

116. RESEARCH IN BACTERIOLOGY. A thesis may be selected in this subject, beginning with the first semester, junior year, major bacteriology, and continuing through four semesters. The laboratory

is especially equipped for work in agricultural bacteriology, and has ample facilities also for research in veterinary, domestic science or pharmaceutical bacteriology. Work for the master's degree either as a major or minor in the department, may be selected. The investigations are all outlined and conducted by the student in cooperation with the head of the department.

Elective; senior year; credits to be arranged.

201. PHARMACY BACTERIOLOGY. The regular course in Bacteriology required for Pharmacy students, consisting of lectures and laboratory work dealing with the medical aspects of pharmacy.

The course in Pharmacy; senior year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

202. PHARMACY BACTERIOLOGY. Continuation of Pharmacy Bacteriology 201, elementary clinical diagnosis, classification of bacteria, qualitative and quantitative determinations.

Prerequisite: Bacteriology 201.

The course in Pharmacy; senior year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

203. CLINICAL BACTERIOLOGY. This course, intended primarily for students in Pharmacy, deals with practice work in the ordinary methods of clinical diagnosis in use. Typhoid, diphtheria, tuberculosis, various pus formations, bacteriological examination of urine and feces, blood counting and differentiation into its elements, and dark ground illumination, are some of the subjects treated.

Prerequisites: Bacteriology 201, 202.

Elective; senior year; first semester; 2 credits; 2 laboratory periods.

204. CLINICAL BACTERIOLOGY. A continuation of the outline presented in course 203.

Prerequisites: Bacteriology 201, 202, 203.

Elective; senior year; second semester; 2 credits; 2 laboratory periods.

205. IMMUNITY AND VACCINE THERAPY. A study of the standard methods in vogue in the various immunity and therapeutic reactions, such as antitoxin formation, preparation of vaccines, and standardization.

Prerequisites: Bacteriology 201, 202, or equivalents.

Elective; senior or graduate year; credits to be arranged.

300. DOMESTIC SCIENCE BACTERIOLOGY. This course deals with bacteriology in its relation to home life. An introduction to the

subject, therefore, is made along theoretical lines, with application to sanitation as concerns the house, covering such subjects as water supply, action of septic tanks, house sanitation, control and prevention of specific diseases, vinegar making, etc.

Course in Home Economics; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

301. **SANITARY BACTERIOLOGY.** This course is primarily for Domestic Science and Art Students in continuation of Bacteriology 300. It deals with methods of sanitary bacterial examination in vogue for water, milk, butter, cheese, meat, air, etc. Certain simple clinical methods are also taught. Use and action of antiseptics and germicides, and the methods of efficient fumigation are given proper attention.

Prerequisite: Bacteriology 300 or equivalent.

Elective for students in Home Economics, or others of equivalent preparation; junior or senior year; 2 credits; 2 laboratory periods.

302. **ZYMOLOGY.** An elective for those of the course in Home Economics who desire a graduate course dealing with technical yeast methods. The subjects include the microscopic structure of the yeast plant, the preparation and manipulation of special media designed for the growth of yeasts, pure culture methods used in zymology, methods of laboratory testing of commercial yeasts, both for use in breadmaking and alcohol production, and the bacteriology of salt-rising bread.

Prerequisites: Bacteriology 300 or equivalent.

Elective; 2 credits; 2 laboratory periods.

307 **PREVENTIVE MEDICINE.** This course is intended for the vocational home makers' course of the School of Home Economics, and deals with questions of bodily resistance to disease in everyday life, and the factors which aid or deter the spread of disease organisms. It includes such questions of home sanitation as pertain to the occurrence and transmission of disease organisms.

Vocational Home Makers' Course in Home Economics; first semester; 1 credit; 2 lectures.

401. **DAIRY BACTERIOLOGY.** This course is devoted exclusively to milk and dairy products. It considers the source of bacteria in dairy products, simple methods of control, the usefulness of certain varieties, special media for milk, etc., methods for milk exam-

ination. It deals also with the economic use of pure cultures of micro-organisms in buttermaking; methods of perpetuating pure cultures for starters; laboratory methods of demonstration of pathogenic bacteria; leucocyte determinations.

Prerequisite: Bacteriology 101.

Senior year; first semester; 3 credits; 2 lectures or recitations; 2 laboratory periods.

501. AGRICULTURAL BACTERIOLOGY. Lectures and laboratory work relating to micro-organic life in the soil in its various activities, such as destruction of organic matter, humus formation, and the various nitrogen changes; but more especially to nitrogen fixation by legume bacteria. The technique of soil inoculation is also emphasized. Other phases of purely agricultural bacteriology are also considered.

Prerequisite: Bacteriology 101.

Elective; senior year; first semester; 3 credits; 1 recitation or lecture; 2 laboratory periods.

502. AGRICULTURAL BACTERIOLOGY. A continuation of course 501, dealing with consideration of special soil changes, such as ammonification, denitrification, non-symbiotic nitrogen fixation, sulphur combinations, and the effects of various methods of tilth on bacterial soil activities.

Prerequisites: Bacteriology 101, 501.

Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

600. WATER AND SEWAGE BACTERIOLOGY. Especially adapted to the needs of civil engineers; and devoted to the bacteriology of water supplies, sewage, and sewage disposal, according to the standards and methods of the American Public Health Association.

Elective; seniors in Civil Engineering, or of equivalent preparation; 2 credits; 1 lecture; 2 laboratory periods.

701. POULTRY DISEASE BACTERIOLOGY. This course is intended to deal with the bacterial consideration of the more common diseases of poultry; and in it will be considered chicken tuberculosis, chicken typhoid, white diarrhoea, roup, and avian diphtheria; soil contamination, and other methods of disease transportation.

Prerequisites: Bacteriology 101, 102, or equivalent.

Junior or senior year; second semester; 2 credits; 2 laboratory periods.

BOTANY AND PLANT PATHOLOGY

PROFESSOR JACKSON
ASSISTANT PROFESSOR BARSS
MR. LAWRENCE
MR. BAILEY
MR. WALLS
MR. OWENS
MR. ATWOOD
MR. GODFREY
MR. POSEY
MR. SCHERER
MR. CORSAUT

The courses offered in the department of Botany and Plant Pathology aim not only to give the student a broad knowledge of plants, their structure, activities, and relationships; but to show wherein the science of Botany is related to the problems of everyday life and the home, and to the practice of Agriculture, Pharmacy, Forestry, and Home Economics.

In the arrangement of work in the courses offered, the point of view of several groups of students is kept constantly in mind, and the work adapted to their needs. In order to make this possible in courses taken by students pursuing different lines of work, separate sections are provided.

The work of the department is carried on by means of recitations, lectures, and laboratory work. Text and reference books are used mainly as an aid in correlating the facts brought out in the study of the plants in the laboratory. Living plants are used wherever possible. Drawing is made an important feature of the laboratory work; because the student, in order to draw accurately, must have observed closely.

Particular attention is given to students desiring to take their major work in this department. Exceptional opportunities are offered, not only to those students who wish to prepare themselves for teaching Economic Biology and Botany in the public schools, but to those who wish to specialize in Botany and Plant Pathology preparatory to teaching or to investigational work in agricultural colleges and experiment stations, or in Government work.

The following courses are offered:

20. **PRINCIPLES OF BOTANY.** This course aims to present in broad laboratory course the fundamental principles of Botany. The higher plants are first traced in their development from the seed to flower, special effort being made to correlate the study of morphology, histology, and physiology of the various parts. The morphology, evolution, and classification of plants will then be traced from lower to higher forms. Finally, the relation of plants to their environment, and their use in nature and to man will be studied. Throughout the course the economic relations of botanical study will be emphasized.

The course in Home Economics; freshman year; first or second semester; 3 credits; 2 recitations; 3 laboratory periods.

30. **FOREST BOTANY.** This course is provided for the purpose of giving Forestry students a general course in Botany, together with special training in those branches of Botany concerning which the forester needs special knowledge. Particular attention will be given to microscopic structure of wood, and to the morphology of gymnosperms and angiosperms.

The course in Forestry; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

31. **FOREST BOTANY.** A continuation of course 30.

The course in Forestry; freshman year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

35. **FOREST PATHOLOGY AND TAXONOMY.** A continuation of courses 30 and 31, which are prerequisite. The first half of the term will be devoted to an elementary study of Forest Pathology consisting of a study of fungi in their relation to diseases of forest trees. During the spring the time will be devoted to practice in the identification of the plants making up the forest flora. This will include not only the taxonomic study of trees, but also of plants making up the forest floor; native forage plants of importance on the forest ranges will also receive attention.

The course in Forestry; sophomore year; second semester; 4 credits; 2 lectures; 3 laboratory periods.

41. **AGRICULTURAL BOTANY.** The fundamental principles of botany as related to agriculture. The general plan of the course

will be as outlined in course 20, special effort being made to bring out the fundamental botanical principles underlying agricultural practice.

The course in Agriculture; freshman year; first semester; 3 credits; 2 lectures; 2 laboratory periods.

42. AGRICULTURAL BOTANY. A continuation of course 41. During the latter part of the term the time will be devoted largely to a systematic study of agricultural plans. Students will also be instructed in the use of keys and methods for the identification of plants.

The course in Agriculture; freshman year; second semester; 3 credits; 1 lecture; 3 laboratory periods.

45. TAXONOMIC STUDY OF FARM WEEDS AND GRASSES. This course aims to familiarize the students with the structure and classification of farm weeds and grasses. Practice will also be given in the identification of other plants of economic importance. A detailed study will be made of well-selected types. The student will make a collection and identify as many specimens as time will permit.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods.

50. PLANT PHYSIOLOGY. An introductory course in experimental Plant Physiology; that is, essentially a study of the life processes of the plant, covering a survey of the nutritional processes, and the growth and the adjustment of the plant to its environment. In this work such subjects will be studied as the general properties of the living cell; principles underlying the intake of the plant from the soil; transportation of materials through the plant; the water losses of the plant; the manufacture of foods, their transformations, digestion and assimilation; and respiration. Throughout the course the importance of a knowledge of the life processes of the plant as a basis for intelligent horticultural and agricultural practice will be emphasized.

The course in Pomology; junior year; elective in the course in Agriculture; junior or senior year; second semester; 3 credits; 2 lectures; 2 laboratory periods.

51. **PLANT PHYSIOLOGY.** A more advanced course, requiring as a prerequisite Botany 50. Further studies in the nutritional processes of plants, and the relationship of plants to the influence of environmental factors.

Elective; senior year; first semester; 3 credits; 1 or 2 lectures; 2 or 3 laboratory periods.

62. **SPECIAL MORPHOLOGY.** An advanced course in the principles of plant morphology. It is designed to familiarize the student with the present information concerning the evolution of form, structure, and methods of reproduction for all groups of plants, except the fungi, and its bearing on the origin of seed plants. The students will also be given an introduction to the principles of taxonomic classification in each group.

Elective; junior or senior year; first semester; 3 credits; 2 lectures; 2 laboratory periods.

64. **PLANT ANATOMY.** This course is designed to present a more advanced study of plant structure than is possible in introductory courses. Various types of plant tissues and their origin will be studied, together with modifications due to environmental conditions. A study of the cell, its methods of division, cell inclusions, etc., will receive attention. In connection with this work the student will be instructed in the various methods of preparing tissues for microscopic study, including fixation, dehydration, infiltration and sectioning, staining, etc. Required of students specializing in Botany.

Elective; junior or senior year; first semester; 3 credits; 1 lecture; 3 laboratory periods.

66. **RANGE BOTANY.** A course dealing with the botanical problems of the range. It aims to familiarize the student with the forage and poisonous plants found on grazing lands. Special emphasis will be placed on the identification of the native grasses. The ecological distribution of these plants will be studied in relation to the depletion, renewal, and maintenance of pastures and ranges.

Elective; junior or senior year; first semester; 2 credits; 1 lecture; 2 laboratory periods.

70. **PHARMACEUTICAL BOTANY.** This course is designed to meet the needs of pharmacy students. The course is so arranged

as to give the general principles of botany, together with a special application to the need of pharmacy students. Particular attention will be given to the study of the cell, cell contents, and types of tissues. Some attention will be given to training in the microscopic identification of drugs and drug adulterants. In the spring, practice will be given in the identification of pharmaceutical plants.

The course in Pharmacy; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

71. PHARMACEUTICAL BOTANY. A continuation of course 70.

The course in Pharmacy; freshman year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods.

80. SEMINAR. Required of all graduate students in Botany and Plant Pathology. The work will consist of reports on advanced studies, and abstracts of articles appearing in experiment station literature, scientific journals, or the agricultural press.

Elective; junior or senior year; first semester; 1 credit will be allowed undergraduate students who attend meetings regularly, and who make satisfactory reports.

81. SEMINAR. A continuation of course 80.

Elective; junior or senior year; second semester; 1 credit as above.

82. RESEARCH AND THESIS. Opportunity will be given students who desire to specialize in Botany and Plant Pathology to take up work not given in the regular courses, or to take up the investigation of special problems.

Elective; senior year; first semester; 1 to 5 credits.

83. RESEARCH AND THESIS. A continuation of course 82.

Elective; senior year; second semester; 1 to 5 credits.

101. PRINCIPLES OF PLANT PATHOLOGY. This course is designed to present the fundamental principles underlying the study of plant pathology. Following are some of the topics to which attention will be given in the course; causes and symptoms of disease in plants; methods of dissemination and distribution of plant diseases; legislation and quarantine; principles of plant disease control; fungicides and their use; disease resistance in plants, etc.

In the laboratory, study will be made of representative plant disease-producing organisms, using these as an introduction to the classification of parasitic fungi.

The course in Pomology; senior year; Plant pathology; junior year; elective in other courses in Agriculture; junior or senior year; first semester; 2 credits; 1 lecture; 2 laboratory periods.

This course is preparatory for, and required as a prerequisite to, all the following courses in Plant Pathology:

102. DISEASES OF ORCHARD AND SMALL FRUITS. A detailed study will be made of the cause and control of all the important fungous, bacterial, and physiological diseases of orchard and small fruits. Particular attention will be given to the diseases of those orchard trees and small fruit crops of importance in the Northwest. The laboratory work will include a careful study of the gross appearance, and the effect on the host of various diseases, as well as a microscopic study of the organisms causing the trouble and their relation to the tissues of the host. Frequent field excursions will be made for observations on the symptoms of important diseases.

Required in the course in Pomology; senior year; second semester; 2 credits; 2 lectures; 1 laboratory period.

104. DISEASES OF VEGETABLE CROPS. Similar, in general, to Botany 102, but deals with diseases of vegetable crops.

Elective; junior or senior year; second semester; 2 credits; 2 lectures; 1 laboratory period.

105. DISEASES OF FIELD CROPS. This course is designed for Agronomy students, to be taken in connection with Botany 101. Students will not be allowed to register in this course who do not also register in 101. The course is similar, in general, to Botany 107, but deals especially with diseases of field crops.

Elective; junior or senior year; first semester; 1 credit; 1 laboratory period.

111. LABORATORY METHODS IN PLANT PATHOLOGY. A training course in the methods of investigation in plant pathology, including methods of keeping records, care of collections, culture work, inoculation, photographic work, etc.

The course in Plant Pathology; junior year; second semester; 2 credits; 1 lecture; 2 laboratory periods.

113. METHODS OF CONTROL OF PLANT DISEASES. Designed to meet the needs of advanced students for a course in special methods employed in the practical control of plant diseases.

The course in Plant Pathology; senior year; elective in the course in Agriculture; junior or senior year; second semester; 1 credit; 1 lecture.

115. TAXONOMY OF PARASITIC FUNGI. In this course, work more advanced than is given in Botany 101 will be taken up, on the taxonomy and phylogeny of plant disease-producing organisms. Practice in the identification of unknown forms will be given. A collection properly prepared for an herbarium will be required.

The course in Plant Pathology; senior year; first semester; 5 credits; 2 lectures; 3 laboratory periods.

116. ADVANCED PLANT PATHOLOGY. Special diseases will be selected and studied thoroughly, both in the field and in the laboratory. Designed to give students training and experience in the original investigation of plant pathological problems; opportunity will be taken to study certain of the more important diseases in a more thorough manner than is possible in the introductory courses.

The course in Plant Pathology; senior year; second semester; 5 credits; 1 lecture; 4 laboratory periods.

Opportunity will be given students to elect work in Economic Botany or Plant Pathology not offered in the above mentioned courses by registering in Botany 82 or 83, either as a major or minor subject. Students who elect Botany as a major study must have completed the work, or equivalent, required in the freshman year of the Agricultural course.

NOTE.—Any of the courses outlined above except 20, 41, 42, 70 and 71, may be taken as a minor elective by junior or senior students in any course upon consultation with the head of the department, provided the course to be elected is not regularly required in the course of study in which the student is registered.

ZOOLOGY

PROFESSOR SYKES

MISS EDWARDS

MR. BLAKE

MR. CHANDLER

MR. HYLAND

The interests of human life are so intimately bound up in the facts of animal life that today, at least, a general knowledge of the science of Zoology is considered a personal asset few students

can afford to omit from their college course. The instruction in this department, therefore, is designed not only to awaken interest in the study of native birds, insects, and other animals to afford a basic knowledge of the structure and functions of the animal body, but particularly to develop the faculty for determining the dynamic value of an animal, or a group of animals, in the solution of the problems of everyday life.

By means of lectures, laboratory work, and field observations, the student becomes familiar with the form and habits of various representatives of the animal kingdom, learning something of the mechanism of living things, of their importance as active forces in nature, and of the biological laws according to which their development is regulated. The work is adapted, so far as is possible, to the particular needs of students in Agriculture, Forestry, Pharmacy, and Home Economics.

Opportunity is offered, moreover, to those who desire it, to receive training for teaching zoology, physiology, or nature study in the public schools; for development of the game and food resources of the State; or for the pursuance of studies in the field of research. In connection with the course in Pharmacy, the required work forms a valuable pre-medical course.

The following courses are offered:

101. GENERAL ZOOLOGY. A general study of animals, both vertebrate and invertebrate, running throughout the year, and introductory to advanced courses in the department; it is also designed for students who, without intending to pursue the subject further, desire a general view of zoological work and its problems. The work consists of lectures and laboratory work, supplemented by *investigations* in the field, and by collateral reading. The aim is to give the student a general knowledge of the different animal forms, their distribution and habits, with special reference to mechanism and functions of the body.

The course in Pharmacy; freshman year; elective for other courses; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

102. ZOOLOGY. A continuation of course 101. The course aims furthermore to give an introduction to laboratory methods of dis-

section and experiment, and to present an outline of the more important biological theories, such as selection, adaptation, and heredity.

The course in Pharmacy; freshman year; elective for others; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

103. FUNCTIONAL ZOOLOGY. A brief course designed to give students in the School of Home Economics some conception of the structure and physiological activities of animals, as a basis for the work in Physiology. The work consists of a general survey of the forms and activities of living organisms, with general reference to the human organism.

The course in Home Economics; freshman year; first or second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

104. EMBRYOLOGY AND HISTOLOGY. A consideration of the origin and development of the individual body; the elementary structure of the adult organs and tissues. The work consists of the study of such typical vertebrates as the chick and the pig, with reference to other domestic animals and to man. It involves practice in micro-technique, such as killing, fixing, imbedding, sectioning, and reconstruction from serial sections, and it is adapted to the requirements of general students, as well as those intending to study veterinary science or medicine.

Prerequisites: Zoology 101, 102; or 108, 109; or equivalent.

For students in Agriculture or Pharmacy, and others; junior or senior year; first semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each.

105. EMBRYOLOGY AND HISTOLOGY. A continuation of course 104.

Prerequisites: Zoology 101, 102; or 108, 109; or equivalent.

For students in Agriculture or Pharmacy, and others; second semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each.

106. GAME PROPAGATION. A laboratory and reading course, supplemented by field work in the propagation of food animals of the field, forest, and stream; the breeding and protection of game birds and mammals; methods of conducting game reservations; and a comparative study of game laws.

Elective for students in Agriculture and Forestry; first semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged.

107. ORNITHOLOGY. A lecture course and field study of the common birds of Oregon; the course aims to develop an interest in the native birds, their habits, and haunts, with particular reference to their usefulness.

Elective; second semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged.

108. PRINCIPLES OF ECONOMIC ZOOLOGY. A course which deals extensively with the facts and conditions which render animal life an important factor in the economic problems of life. Like 101, however, it aims to give the student a general knowledge of the different animal forms, their distribution and habits, and the more important physiological functions of the animal body; but it lays particular stress upon the dynamic interpretation of life. The course is designed to meet the particular needs both of students in Agriculture and in Forestry. The work will consist of lectures and laboratory exercises, supplemented by a considerable amount of collateral reading.

Required of Agricultural and Forestry sophomores; first semester; 3 credits, 2 lectures; 1 laboratory period of three hours.

109. PRINCIPLES OF ECONOMIC ZOOLOGY. Continuation of course 108, which aims to bring the student in contact with the more vital economic problems to be met in the various fields of interest—agricultural or sylvan. An outline of the different biological theories will be presented with a view to enabling the student to come into possession of certain fundamental principles, the knowledge of which may afford him an insight into the more far-reaching significance of the problems of everyday life.

Required of Agricultural and Forestry sophomores; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

110. ANIMAL PARASITES. An advanced course for the study of such parasitic forms as flukes, tapeworms, nematodes, fish "lice," cattle ticks, etc., that affect the health of man, domestic, and food animals; the study will be primarily ecological, the object being to obtain a more exact knowledge of the conditions which produce

parasitism, to the end that by intelligent control, diseases and economic losses may be rendered less liable, and preventive measures made productive of more permanent results.

Prerequisite: Zoology 101, 102; or 108, 109; and 104, 105; or the equivalent.

Elective to students in Agriculture, Forestry, and Pharmacy; junior or senior year; first semester; 2 credits; hours to be arranged.

111. PROTOZOOLOGY. An advanced course for the study of microscopic animals with a view to their relation, beneficially or injuriously, to man, particular attention being paid to such pathogenic forms as blood spores and enteric parasites, with some reference to soil protozoans.

Prerequisites: Zoology 101, 102; or 108, 109; and 201, 202; or the equivalent.

Elective for students in Agriculture and Pharmacy; junior or senior year; second semester; 2 credits; hours to be arranged.

112. RESEARCH AND THESIS. Opportunity will be given students who desire to specialize in Zoology and Physiology to take up work not given in the regular courses, or to undertake the investigation of special problems. Work for the master's degree, either as a major or as a minor in this department, may be selected. It is the policy of the department to allow the student to develop his own initiative in the selection of a problem, and in outlining and conducting his investigations, but with the cooperation of the head; or other member, of the department.

Elective for seniors and graduates; first semester; credits to be arranged.

113. RESEARCH AND THESIS. A continuation of course 112.

Elective for seniors and graduates; credits to be arranged.

114. AQUACULTURE. Lecture, laboratory, and field course dealing with the problems and methods of sea-farming and fish culture; that is, the hatching and rearing of fish and other aquatic food animals, the planting and care of oyster and clam beds, and a study of the various methods of production and preparation for market.

Elective for Agriculture and Forestry students; first semester; credits to be determined; hours to be arranged; not offered in 1914.

116. TAXIDERMY. Lecture, laboratory and field course in the methods involved in the preparation of skins, the preservation of museum specimens, and a study and practice of the methods involved in field survey work.

Elective for Agriculture and Forestry students; second semester; credits to be determined; hours to be arranged.

120. GENETICS. A lecture course dealing with the general principles of heredity, and the factors involved in variation and inheritance, the object being to afford students specializing in dairy husbandry, etc., a general knowledge of the fundamental principles of breeding. The course will be prefaced by lectures on the phenomena of reproduction; and will be followed by an explanation of the mechanism of heredity, involving a discussion of problems of inheritance of acquired characters, segregation, dominance, and sex determination, with respect to their application both to the human and to the domestic forms. The lectures are to be accompanied by frequent demonstrations, and supplemented by a considerable amount of collateral reading. Experimental problems may be outlined for practical investigation for those who may desire to carry on such work.

Elective for juniors in Agriculture, and others; first semester; 3 credits; 3 lectures.

201. PHYSIOLOGY AND ANATOMY. This course is intended not only for the general student, but also for those students particularly interested in this branch of Zoology, and for those who expect to study medicine. It includes a study of the structure, significance, and function of the human body, with reference to the animal body in general. As a foundation for the study of function, the laboratory course includes some work upon the gross anatomy and the histology of the various tissues and organs of a typical mammal. It also includes experiments and demonstrations with foods, the study of blood, nerve-muscle, reactions, etc.

Prerequisites: Zoology 101, 102, or the equivalent.

The course in Pharmacy; sophomore year; elective for other students; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

202. PHYSIOLOGY AND ANATOMY. A continuation of course 201, especially valuable to those who expect to teach Physiology in the

public schools. In connection with the work in Pharmacy it forms a valuable pre-medical course. Required course for Pharmacy sophomores.

Prerequisites: Zoology 101, 102, 201.

The course in Pharmacy; sophomore year; elective for other students; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

204. **PHYSIOLOGY AND HYGIENE.** A general course designed primarily to give Commerce students a practical knowledge of the functions and care of the human body in everyday life. The laboratory will be of such a nature as to furnish demonstration of the physiological principles.

Elective to Commerce in conjunction with Bacteriology 101; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

205. **NUTRITIONAL PHYSIOLOGY.** An advanced course dealing particularly with the processes of digestion, absorption, nutrition, secretion, and excretion.

Prerequisites: 101, 102, 207, 208; or the equivalent.

Elective for students in Home Economics; senior year; first semester; credits to be determined.

207. **PHYSIOLOGY.** The object of this course is to give to the Home Economics student that knowledge of life processes and anatomical relationships which will be most useful in maintaining the highest efficiency of the human mechanism. The chief functions of the human body and the laws of health falling naturally within the province of the physiologist, will be studied. The laboratory course will supplement the lectures and recitations, and include such experimental, histological, and anatomical work as will best serve the object of the course.

Home Economics; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

208. **PHYSIOLOGY.** A continuation of 207.

Home Economics; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

209. **PSYCHOLOGICAL PHYSIOLOGY AND ANATOMY.** An advanced course designed to furnish a better mental equipment for students specializing in pedagogical psychology.

Prerequisites: 101, 102; 201, 202; or the equivalent.

Elective for seniors in Industrial Pedagogy, and others. Hours to be arranged; credits to be determined.

ENTOMOLOGY

PROFESSOR WILSON

ASSISTANT PROFESSOR LOVETT

MR. CHILDS

MR. MOZNETTE

MR. CHAMBERLAIN

MR. GENTNER

The courses in Entomology are planned to give the student sufficient knowledge of the subject to understand the proper relation of Entomology to the different phases of Agriculture; to meet the needs of the student specializing in Entomology; and to serve the needs of students from other departments in which certain special courses are required. Students who wish to elect Entomology as a major may, if they desire, specialize in one or more branches by choosing their research problems in definitely grouped subjects. These groups include General Entomology, Agricultural Entomology, Civic Entomology, Entomology for Horticultural Inspectors, and Forest Entomology.

The courses in General and Economic Entomology are intended to provide the student with sufficient training to enable him to identify the common insect pests, understand their habits and life history, and to apply the most approved methods for their control.

Forest Entomology includes the practical investigation of certain areas of timber to determine the kind and extent of insect infestation, methods of making out correct reports on forest insect infestation, and an investigation of the principles underlying control methods.

Advanced students in Entomology are provided with excellent opportunities for special instruction and research work. The library facilities are unusually good; the insect fauna of the western part of the State is distinctive, offering many new and interesting features for investigation.

Scheduled courses in this department will not be given to a class of less than five students.

The following courses are offered:

301 INTRODUCTORY ENTOMOLOGY. An introduction to the study of insects by lectures, laboratory, and field exercises. Sufficient field work in collecting, and laboratory work in properly mounting and classifying insects, is provided to make the student familiar with the principal orders of insects. In this and succeeding courses in Entomology, the rearing of economic and other forms of insects, is carried on parallel with other work, to gain familiarity with the development and habits of insects. Each student is required to familiarize himself with the life-history, habits, and means of controlling some insect of economic importance.

Prerequisites: Zoology 101, 102, and a collection of insects consisting of at least 250 specimens.

Required in the courses in Horticulture, Plant Pathology, and Entomology; elective in other courses; junior year; first semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period.

302. ENTOMOLOGY OF ORCHARD AND SMALL FRUITS. An intensive study of the more important insect enemies of the apple, pear, prune, cherry, plum, currant, gooseberry, bramble fruits, and strawberry, and the critical examination of the methods to be employed in combating them. Each important pest will be studied in the field and laboratory, with a view to becoming thoroughly familiar with the appearance of the insect and its work in all its stages of development.

Prerequisite: Entomology 301.

Required in the courses in Pomology, Plant Pathology and Entomology; elective in other courses; junior year; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period.

303. ENTOMOLOGY OF TRUCK AND FIELD CROPS. A course similar to 302, with special emphasis put on the intensive study of the insect enemies of celery, onion, beet, cabbage, kale, clover, vetch, potato, hop, corn, wheat and oats.

Prerequisite: Entomology 301.

Required in the course in Vegetable Gardening; junior or senior year; elective for students in other courses; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period.

304. FOREST ENTOMOLOGY. A study of insect injuries to forest trees and forest products, factors influencing their occurrence, and the general principles of forest insect control work.

The course in Forestry; junior year; second semester; 3 credits; hours to be arranged.

305. FOREST ENTOMOLOGY. A continuation of course 304.

Prerequisite: Entomology 304.

The course in Forestry; senior year; first semester; 2 credits; hours to be arranged.

306. ADVANCED ENTOMOLOGY. This course is designed for those who desire to specialize in Entomolgy. The instruction includes lectures and reference reading upon the biology of the principal families of insects, supplemented by laboratory studies of typical life-histories. Considerable time is devoted to studying the habits of insects, particularly injurious species in the field; to collecting, rearing, mounting, and classifying them; and to becoming familiar with entomological methods and literature.

Required in the course in Entomology; elective in other courses in Agriculture; junior year; second semester; 3 credits; 2 lectures; 2 laboratory periods.

307. ADVANCED ENTOMOLOGY. A continuation of course 306.

Required in the course in Entomology; elective in other courses in Agriculture; senior year; first semester; 5 credits; 2 lectures; 3 laboratory periods.

308. ADVANCED ENTOMOLOGY. A continuation of courses 306 and 307.

Required in the course in Entomology; elective in other courses in Agriculture; senior year; second semester; 5 credits; 2 lectures; 3 laboratory periods.

In connection with courses 306, 307, and 308, the student will be required to present a thesis, giving in detail the results of a systematic study of some restricted group of insects, or of the biology of some particular species or group of species.

317. HOUSEHOLD ENTOMOLOGY. A study of insects in their relation to pharmacy and to the household. The history and development of insects in medicine, insects in relation to disease, and insect pests of dwellings and stores. Control methods will be taken up in detail. This course is intended to prepare students in Pharmacy and Home Economics intelligently to understand the relation of in-

sects to the household and the community, and the principles underlying methods of control. Primarily for Pharmacy students; open to students in Home Economics and to others by special permission.

Two credits; 2 lecture periods.

309. BEE KEEPING. A course in the theory and practice of keeping bees for profit, and in relation to fertilization of orchard trees. The College has an apiary in which students will be able to become fully acquainted with modern apicultural methods.

Elective in the courses in Agriculture, and Home Economics; second semester; 1 credit; 1 laboratory period.

310. SEMINAR. Senior and graduate students in Entomology. Reading, discussing, and abstracting the leading articles on Entomology as they appear in the scientific journals, horticultural press, current magazines, and experiment station literature.

Senior year; first semester; one credit.

311. SEMINAR. A continuation of course 310.

Senior year; second semester; 1 credit.

312. PROBLEMS IN FOREST ENTOMOLOGY. This course will include the study and application of methods of forest insect investigations. Each student will be assigned a practical problem in Forest Entomology to work out under direction.

Credits to be arranged.

313. PROBLEMS IN FOREST ENTOMOLOGY. A continuation of course 312.

Prerequisite: Entomology 312.

Credits to be arranged.

SCHOOL OF FORESTRY

PROFESSOR PEAVY

ASSISTANT PROFESSOR NEWINS

MR. CONOVER

MR. ——— ———

NON-RESIDENT LECTURERS

J. P. VanOrsdel, Portland Lumber Company.

E. T. Allen, Western Forestry and Conservation Association.

J. D. Young, Inman-Poulsen Lumber Company.

E. O. Siecke, Deputy State Forester.

T. Munger, Federal Forest Service.

J. C. O'Gorman, Wisconsin Logging Company.

Geo. M. Cornwall, Editor "The Timberman".

A. FOREST PROTECTION. Causes of forest fires; the methods of controlling forest fires; the proper organization of fire patrol over definite areas; fire fighting devices; lookout stations, telephone lines, roads, and trails, with reference to fire control; different methods, applicable to different regions.

Forester's short course; first semester; 3 credits.

B. FOREST PROTECTION. A continuation of course A.

Forester's short course; second semester; 3 credits.

C. FOREST MEASUREMENTS. The fundamental principles involved in computing the solid contents of logs and trees; methods of constructing scale rules; height measures; forest service methods of cruising timber; other methods; discounts for defects; volume tables. Practical demonstrations in the woods.

Forester's short course; first semester; 3 credits.

D. FOREST MEASUREMENTS. A continuation of course C.

Forester's short course; second semester; 3 credits.

E. FOREST SURVEYING AND MAPPING. A study of the United States system of land surveys. Retracing surveyed lines; methods employed in marking surveyed lines; the use of the compass; the surveyor's chain; plane table, Abney hand level; practical field work in surveying; the use of the aneroid barometer in topographic surveying. The details of map making; conventional signs used in mapping.

Forester's short course; first semester; 3 credits.

F. FOREST SURVEYING AND MAPPING. A continuation of course E.

Forester's short course; second semester; 3 credits.

G. FOREST IMPROVEMENTS. The construction of roads, trails, telephone lines, lookout stations, bridges, cabins, etc. Costs.

Forester's short course; first semester; 3 credits.

H. FOREST IMPROVEMENTS. A continuation of course G.

Second semester; 3 credits.

K. FOREST ADMINISTRATION. The organization of the Federal Forest Service; the district office; the national forest. The State Forester's office; organization of the State work. Forms used in the transaction of forest business; the preparation of reports.

Forester's short course; first semester; 1 credit.

L. FOREST ADMINISTRATION.

A continuation of course K.

Forester's short course; second semester; 1 credit.

101. GENERAL FORESTRY. A brief study of those economic conditions pointing to the necessity of conserving our natural resources. The forest regions of the United States. Forest ownership, private, state, and national. The elements of state and national forest policy. The economic importance of the forests to the United States, and to Oregon in particular.

Freshman year; first semester; 4 credits; 4 recitations.

103. FOREST HISTORY AND ECONOMICS. The development of European forestry. Progress of American forestry. The economic importance of forest products. Transportation as affecting the lumber industry.

Junior year; second semester; 3 credits.

201. SILVICULTURE. The art of establishing, developing, and reproducing trees, including their life-history, influences, modification and growth; the soil, climate, and other factors of site; types, theoretical silvicultural systems of management; the application of the clear cutting, selection, shelter wood, coppice, group, and strip systems, to American conditions.

Sophomore year; first semester; 3 credits; 3 hours field work; 2 hours lecture.

202. SILVICULTURE. The improvement of woodlands; cleanings; thinnings; protection of forests as related to Silviculture, laying emphasis upon methods of fire protection in the Northwest; arti-

ficial and natural regeneration; tree seeds, their structure, form, distribution; seed collection; seed testing; seed storage; generation periods; nursery practice; forest planting; planting plans; cost of planting. Silvical studies.

Sophomore year; second semester; 3 credits; 3 hours field work; 2 hours lecture.

203. **ADVANCED SILVICULTURE.** In this course the forest regions of the United States are subdivided into silvicultural divisions. In each subdivided unit a study is made of forest physiography, prevailing forest types, silvicultural management, problems of protection, market relations, and a review of the silvical habits of trees important from the standpoint of management. The study of the divisions in the West embraces all the national forests of the six federal districts, and their location.

Junior year; first semester; 3 credits; 2 laboratory periods.

204. **ADVANCED SILVICULTURE.** Silvical literature. Each student will be required to make a detailed silvical study of some definite forest tract, and present a thesis covering the work. Investigation of special silvical problems. The working out of problems of management under special conditions.

Junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

301. **MENSURATION.** The methods of determining the contents of logs in cubic feet and in board feet; log rules; methods employed in cruising timber. Instruments used in timber; volume tables; yield tables. Field work at the mills, and in the woods. Each student is required to cruise, describe, and map, a given piece of timber.

Junior year; first semester; 4 credits.

302. **MENSURATION.** A continuation of course 301.

Junior year; second semester; 4 credits.

303. **FOREST SURVEYING AND MAPPING.** Topographic and plane surveys of rough timbered areas. The use of the Abney hand level, aneroid barometer, plane table, cavalry sketching board, and hand compasses. Mapping field data; drill in the detail of map making.

Junior year; first semester; 2 credits.

401. **FOREST MANAGEMENT.** The business of administering the forest; policies with reference to National, State and private forests. The value of land for forest production; the value of young growth. The preparation of a detailed working plan for a given forest, a

valuation survey, including volume and yield tables, maps and complete forest description. The organization of the administrative force of the forest.

Senior year; first semester; 5 credits.

402. MANAGEMENT. A continuation of course 401.

Senior year; second semester; 4 credits.

404. LUMBERING. The history of the lumber industry, including a study of the methods used in different regions; special attention to lumbering operations in the Northwest; the transportation of logs from the woods to the mill; the use of steam machinery in skidding and hauling; driving; the methods of milling; seasoning and grading; the cost of logging and milling with reference to some definite operation. During the course, each student will be required to prepare a thesis from data collected by personal study of some extensive logging and milling business.

Senior year; second semester; 5 credits; 2 recitations; 3 laboratory periods.

405. FOREST ADMINISTRATION AND IMPROVEMENT. A study of the methods of administering the Federal forests; the organization of the administrative force of the forest; fire patrol; timber sales; grazing; the forest homestead law; permanent improvements, roads, trails, fire lanes, telephone lines, bridges, cabins.

Senior year; first semester; 3 credits.

406. FIELD WORK. This course is based upon practical work, performed by the student between the sophomore and junior years, or between the junior and senior years. The work must be done on some modern logging operation, or in connection with some technical forestry work carried on by the State or by the Forest Service. A report based upon an approved outline must be submitted.

From 1 to 5 credits.

408. SEMINAR. Preparation and discussion of reports on special subjects. Current forestry and lumbering literature. Each student is required to prepare a thesis on some assigned subject.

Senior year; first semester; 3 credits.

409. SEMINAR. Continuation of course 408.

Senior year; second semester; 2 credits.

501. DENDROLOGY. Classification and identification of all forest trees, including a study of forest ecology and taxonomy; the sil-

vical characteristics of commercial species; forest regions of the United States; relative importance of timber species; life-history and requirements of trees.

Senior year; first semester; 5 credits.

502. **TIMBER TECHNOLOGY.** The studies in timber technology include both microscopic and macroscopic characteristics by which wood may be identified; cell structure from a taxonomic standpoint; defects due to knots, decay, checks; structural changes due to seasoning; relation between moisture content and strength; chemical properties. The course includes the subjects of Forest Utilization and Wood Preservation. In Utilization the adaptation of woods to the various minor industries is considered in detail, such industries as the following being discussed: pulp, cooperage stock, veneer, matches, charcoal, etc. In wood preservation the factors of decay and preservative methods are studied. Open tank and pressure methods of applying preservatives, and the relative value of different preservatives.

Senior year; second semester; 4 credits.

504. **DENDROLOGY.** The course in Dendrology for Logging Engineers is designed to suit the needs of the engineer without requiring the silvical studies which are considered in the forestry course. Species of commercial importance in the Pacific Northwest are studied in particular, and their taxonomic relations to all other species are clearly defined.

Junior year; second semester; 3 credits.

505. **FOREST PROTECTION.** Protection from fire, insects, and fungi; and methods of control. The course deals mostly with protection from fire, laying emphasis upon preventive measures, such as the construction of lookouts, telephones, trails, roads, and fire lines. State and federal fire laws. Patrol associations; organizations of a patrol system, costs; fire fighting; equipment; and ration lists. Field demonstrations in transportation of supplies, and the use of the various hitches used in "packing."

Sophomore year; second semester; 3 credits.

506. **COMMERCIAL WOODS.** The course is designed primarily to meet the requirements of the woodworker in choosing the species of wood best adapted to his needs, and in identifying the woods com-

monly used; macroscopic and microscopic identification of different species; dendrology and its significance in wood technology; taxonomy, showing how trees are classified.

First semester; 2 credits; 1 hour lecture; 3 hours laboratory or field.

601. LOGGING RAILROADS. The special problems connected with the construction of logging railroads, such as grades, curves, cuts, fills, switch-backs. Lectures and discussion, followed by field study on some extensive logging operation.

Junior year; first semester; 3 credits.

602. LOGGING ENGINES. A study of the construction and operation of engines used in logging operations. Laboratory and field work.

Senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

603. BRIDGE CONSTRUCTION. This course deals with the construction of the peculiar types of bridges used in logging operations. Factor of safety. Costs. Preliminary laboratory exercises, followed by studies on logging operations.

Senior year; second semester; 3 credits.

407. LOGGING MANAGEMENT. The business problems connected with logging; organization of the working crews; cost of operations; cost keeping systems; improved methods. Experts in logging will deal with special phases of the subject.

Senior year; second semester; 3 credits; 3 recitations.

604. LOGGING DEVICES AND EQUIPMENT. Bridge, flume and chute construction; methods of slinging rigging; types of cars; skidding and loading devices; electrical machines used in logging; detailed investigation of costs and makes of equipment. Special reports accompanied by photographs, maps and drawings, will be required. At least three weeks of each semester must be devoted to the study of some up-to-date logging operation.

Senior year; first semester; 5 credits; 2 recitations; 3 laboratory periods.

605. LOGGING DEVICES AND EQUIPMENT. A continuation of course 604.

Senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

SCHOOL OF HOME ECONOMICS

DOMESTIC SCIENCE

PROFESSOR CALVIN

ASSISTANT PROFESSOR MILAM

MRS. DOLMAN

MISS LEWIS

MISS SMITH

MISS DAVIS

MISS MOORE

The following courses are offered:

E. LAUNDERING. The principles of laundering through practical application, together with a study of cleansing materials, choice of starch, bluing, and soap; and the treatment of hard water. The cleansing process for all types of materials, methods of removing stains, folding and care of clothing.

Home makers' course; second year; second semester; 1 credit; laboratory period.

H. FOOD PREPARATION. Three lectures and twelve laboratory hours per week throughout the year. Food, its sources, its economical purchase, storage, and use. The effect of heat and microorganisms on food, and the changes undergone by food material in the body. Careful instruction in the preparation of menus and the selection of food, that it may be properly adapted to the age and need of the consumer. Laboratory work in the preparation of vegetables, meats, breads, and fruits.

Home makers' course; first semester; 6 credits; 3 recitations; laboratory periods.

I. FOOD PREPARATION. A continuation of course H. The greatest attention is paid to the preparation and service of meals and to the purchase and preservation of food.

Home makers' course; second semester; 6 credits; 3 recitations; laboratory periods.

J. CARE OF CHILDREN. Lectures relating to the physical, mental, and moral development of the child; the bathing and feeding of infants.

Home makers' course; second semester; 1 credit; 2 lectures.

K. **SANITATION AND CARE OF THE HOME.** Lectures and laboratory hours relating to the study of the home. The choice of site for dwelling. General construction, lighting, heating, plumbing, disposal of waste, and general care of the dwelling house. The laboratory time is devoted to the study of the modern labor-saving devices of the household and the best cleaning agents, the care of floors and woodwork, and the common laundry operations. This course is optional with that of English.

Home makers' course; first semester; 3 credits; 2 lectures; 1 laboratory period.

L. **PERSONAL HYGIENE.** Discussions relating to the care of the skin, eyes, ears, and respiratory tract; the relation of clothing and posture to health and the necessity of exercise and fresh air. Such elementary physiology as is essential to the understanding of this course is given in connection with these lectures.

Home makers' course; first semester; 2 credits; 3 lectures.

M. **HOME NURSING AND INVALID COOKERY.** Lectures on the care of the sick room, the observation of symptoms, the administration of medicine, first-aid to the injured, and disinfection and management of contagious diseases. The laboratory consists of preparation of food for the sick, proper food combinations, and manner of service. This course is optional with that of English.

Home makers' course; second semester; 2 credits; 2 lectures; 1 laboratory period.

101. **FOOD PREPARATION.** An introduction to the subject of foods in their scientific and economic aspect. Laboratory work in the preparation of food, with a study of the changes brought about by the applications of heat, experiments being made to illustrate the principles involved. The classes prepare all of the common foods in many ways, serve simple meals, and study suitable food combinations.

Sophomore year; first semester; 3 credits; 2 recitations; 1 laboratory period.

102. **FOOD PREPARATION.** A continuation of course 101.

Sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period.

103. **FOOD PREPARATION.** A survey course of 101 and 102 for graduates of secondary schools with training in Domestic Science.

Sophomore year; first semester; 3 credits; 2 recitations; 1 laboratory period.

104. FOOD PREPARATION. This course elaborates the principle taught in Food Preparation 101 and 102, and introduces more advanced work. An application of the knowledge of the sciences made by canning, preserving fruits, and making jellies. Bread cake, other flour mixtures, and the preparation of vegetables and meats are also studied until the student has mastered the subject. The lectures are devoted to questions of nutrition and the economical purchase and use of food.

Junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

105. FOOD PREPARATION. A continuation of course 104. The preparation and service of meals is the chief laboratory work of the second semester.

Junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

110. EXPERIMENTAL COOKERY. The various methods and temperatures used in cooking are tested as to results. Wood, alcohol, oil, gasoline, and electricity are all used to produce the required heat and their comparative cost and effectiveness are studied. Labor-saving cooking devices are experimented with and the results recorded.

Elective; senior year; second semester; 1 credit; 1 three-hour laboratory period.

120. METHODS IN DEMONSTRATION. A course in which students are prepared to give public demonstrations in food preparation. Lectures are given on the results to be attained from demonstrations, equipment required, organization of plans, and general methods of procedure. Demonstrations are given by various teachers before the students, followed by student demonstrations.

Elective; senior year; second semester; 1 credit; 1 three-hour laboratory period.

180. FOOD PREPARATION. For women desiring knowledge of home cookery. A study of typical foods and their preparation in attractive forms, with the planning and serving of meals.

One evening lesson per week. A term of twelve lessons.

Either semester; hours to be arranged.

190. **CAMP COOKERY.** Instruction in various ways of combining into palatable and nutritious products such food materials as are available for use in camps. The making of different kinds of breads, as well as mulligans, griddle-cakes, and other camp dishes; practice during the latter part of the course in preparing food out of doors by means of Dutch ovens; reflectors, and improvised cooking utensils.

Elective; junior or senior year in Forestry course; second semester; 1 credit; 1 laboratory period.

201. **DIETETICS.** A scientific study of food materials in their relation to the daily dietary of families under various conditions of health and environment; a study of the dietary standards and the metabolism of carbohydrates, fats and proteins. A comparison of the nutritive values of the common foods, made by computing, preparing, and serving dietaries of specific costs, furnishing specific nutrients.

Elective; senior year; first semester; 4 credits; 2 recitations, 2 laboratory periods.

202. **DIETETICS.** A continuation of course 201. During the second semester, special stress on invalid diets, and diseases as affected by food.

Senior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

210. **CATERING.** Designed to prepare the students for positions in large institutions, and also enable them to establish and maintain tea rooms and lunch rooms, and to act as caterers for private entertainments. The students assist in the purchase, preparation, and service of foods in the cafeteria, and are expected to devote the equivalent of eighteen hours per week to the course.

Elective; senior year; either semester; 6 credits; 6 laboratory periods of three hours each.

301. **HOUSE SANITATION.** The house as a factor in health. Situation, surroundings, ventilation, heating, drainage, plumbing, lighting, and furnishing of the house. Investigation will be made of general sanitary conditions from a practical and scientific standpoint with special reference to the needs of the community, the household, and the school.

Junior year; first semester; 2 credits; 3 recitations.

501. **HOUSEHOLD ADMINISTRATION.** The order and administration of the house, the proper division of the income and labor; the maintenance of suitable standards of health and efficiency; and study of the domestic service problem.

Senior year; second semester; 3 credits; 3 recitations.

504. **INSTITUTIONAL MANAGEMENT.** The purchase of food and equipment in large quantities; methods of record keeping; and the general methods of sanitation and care of buildings wherein many are housed and cared for.

Senior year; either semester; 3 credits; 3 laboratory periods of three hours each.

510. **HOUSEWIFERY.** Practical lessons in the care of the household including such matters as the treatment of floors, walls, and woodwork; the removal of stains; the cleaning of rugs and carpets and the laundering of household linen and clothing.

Junior year; either semester; 2 credits; 1 recitation; 2 laboratory periods.

511. **HOME NURSING.** The scientific care of the patient under home conditions, including the furnishings, temperature, and ventilation of the room; bathing, dressing, and administering food and medicine to the patient; and also a study of the other duties of the home nurse in aiding the physician intelligently to add to the comfort of the sick. This means the ability to recognize and correctly report symptoms; to relieve pain; to disinfect, and to treat wounds, burns, and sprains; as well as to meet successfully emergencies that may arise in the home.

Sophomore year; either semester; 3 credits; 3 recitations.

550. **MODERN PROBLEMS IN HOUSEHOLD ADMINISTRATION.** The topics assigned for research will be chemical, physiological, bacteriological, economical, or sociological, according to the preferences and training of the individual students.

Graduate year; first semester; credits to be arranged.

551. **MODERN PROBLEMS IN HOUSEHOLD ADMINISTRATION.** A continuation of the research work commenced in course 550.

Graduate year; second semester; credits to be arranged.

701. **SPECIAL RESEARCH IN COOKERY.** In assigning research problems for graduate students, both the previous training and the

students' preferences are considered. Assignment of problems to be worked upon during the year is made by the professor in charge.

Graduate year; first semester; credits to be arranged.

702. SPECIAL RESEARCH IN COOKERY. Continuation of research work commenced in course 701.

Graduate year; second semester; credits to be arranged.

DOMESTIC ART

PROFESSOR BROOKS

ASSISTANT PROFESSOR ROBINSON

MISS HITCHCOCK

MISS PEER

MRS. SCHILLING

MISS KEATLEY

The following courses are offered:

K. HAND SEWING AND GARMENT MAKING. Lectures relating to textiles, their production, and manufacture, given for the purpose of assisting the home maker in her selection and use of the fabrics used in the home. Emphasis upon the care and storage of household linens. The laboratory work is planned so as to give the student the practical experience in the making of all needle-work problems that are to be met in the home.

Home Makers' course; first semester; 5 credits; 3 recitations; 3 laboratory periods.

L. DRESSMAKING. Follows Course K. The lectures relating to the manufacture of cloth, its adulterations, economical purchasing, and use. Laboratory work giving the student experience in the making of wash dresses, childrens' dresses, woolen dresses, and the renovating and making of one woolen dress. Draughting of patterns, as well as the use of commercial patterns.

Home Makers' course; second semester; 5 credits; 3 lectures; 3 laboratory periods.

N. HOUSE FURNISHING. A practical course in the decorating and furnishing of the entire house. The problems of economic and artistic furnishing will be considered. Visits to house furnishing stores for the purpose of selecting materials will be a feature of this course.

Home Makers' course; second semester; 2 credits; 2 lectures; 1 laboratory period.

101. SEWING. The fundamental principles of hand and machine sewing applied to household linens and undergarments. Darning, patching, and care of clothing are considered.

The study of the development of the textile industries will give a deep appreciation for fabrics, and the responsibility for thoughtful purchasing.

Freshman year; first semester; 3 credits; 1 recitation; 3 laboratory periods.

102. GARMENT MAKING. Continuation of course 101 in which draughting and making of undergarments will be presented. Simple embroidery stitches will be taught where such are applicable. The study of cotton will give an added value to the garments being made.

Prerequisite: Domestic Art 101.

Freshman year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

103. GARMENT MAKING. A course designed for graduates of approved high schools with Domestic Art training.

Freshman year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

201. DRESSMAKING. The fundamental principles of dressmaking; the draughting, making, and adjusting of patterns to measurements; the making of shirt waists, tailored skirts, and a simple cotton dress.

The textile work will be a study of linen.

Prerequisites: Domestic Art 101, 102.

Junior year; first semester; 3 credits; 1 recitation; 3 laboratory periods.

202. DRESSMAKING. Continuation of course 201.

The textile work will be a study of silk and wool.

Prerequisite: Domestic Art 201.

Junior year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

203. TAILORING. This course has for its problem the making of a cloth jacket suit. Careful draughting of the patterns and excellence of construction and finish will be required.

Prerequisites: Domestic Art 202 and 204.

Senior year; first semester; 3 credits; 1 recitation; 3 laboratory periods.

204. **ADVANCED DRESSMAKING.** Draughting and making of elaborate gowns. Emphasis on color combinations, technique, suitability of design for material used, and for purpose intended.

Prerequisite: Domestic Art 202.

Senior year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

301. **MILLINERY.** Designing and constructing buckram and wire frames. Making and placing of trimmings, renovation of materials, straw sewing, bow making, and the construction of a hat from foundation to completion.

Senior year; second semester; 2 credits; 2 laboratory periods.

401. **BASKETRY.** A form of decorative art which involves careful consideration of form, color, and design; these principles will be considered in the making of rugs, reed baskets, stools, and raffia baskets.

Elective; senior year; first semester; 2 credits; 3 laboratory periods.

404. **HANDWORK AND WEAVING.** The study of advanced handwork, knitting, weaving, embroidery stitches and design as applied to costume, embroidery, and decorative design for household purposes.

Elective; senior year; second semester; 2 credits; 3 laboratory periods.

501. **HOUSE CONSTRUCTION AND DECORATION.** Two lectures and two laboratory periods each week to the study of house construction and furnishings. The laboratory hours are devoted to the making of plans for medium-sized residences; the best utilization of space, the most economical placing of equipment, and the decoration and furnishing of a house in the most economical, sanitary, and artistic manner. The lectures relate to the development of house building and the reasons for the selections. Every phase of house furnishing will be studied—floor coverings, furniture, linens needed, curtain hangings, china, silver, pictures—in such a manner as to give a full grasp of a problem likely to be met by every student.

Senior year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

601. **ADVANCED TEXTILES.** The identification of textile materials, their names, kinds, prices, and widths; variation in weave

in regard to beauty and strength; the use and value of cotton, silk, wool, and linen for clothing and household furnishings. The identification of fibers and substitute material by means of the microscope; the chemical examination of fibers, including tests to determine content of cloth and adulteration; and proper use of materials in relation to cleansing and laundering.

Elective; senior year; second semester; 2 credits; 1 recitation; 2 laboratory periods.

701. COSTUME DESIGN. Study of the figure; sketching of garments, hats, and gowns; draughting of patterns; designing and modeling in material; study of design for embroidery and dress decoration.

Elective; senior year; first semester; 2 credits; 1 recitation; 2 laboratory periods.

SCHOOL OF ENGINEERING AND MECHANIC ARTS

CIVIL AND HIGHWAY ENGINEERING

PROFESSOR SKELTON

ASSISTANT PROFESSOR EDGECOMB

MR. DOLAN

MR. SMITH

The following courses are offered:

105. **MECHANICAL DRAWING.** The use of instruments and the elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, and finally, the complete development of a working blue print of some simple device from sketches. Particular attention is given to free-hand lettering, general neatness, and accuracy.

Highway, Irrigation, and Mining Engineering; first semester; 4 credits; 4 laboratory periods.

111. **ENGINEERING DRAWING.** A continuation and extension of the previous work in drawing, with special reference to application in Highway and Irrigation Engineering. Practice in tracing and in blue and black line process printing will be given.

Prerequisite: C. E. 105.

Freshman year; second semester; 3 credits; 3 laboratory periods.

222. **PLANE SURVEYING.** This course includes recitations, lectures, field and office work in the theory and practice of plane surveying. The theory and construction of the different surveying instruments are studied, and practice will be given in making their tests and adjustments. The United States public land surveys and land laws are studied. Forms of field notes, methods of balancing and plotting surveys, computing areas and like work, will have due consideration. Proper emphasis will be placed upon chain surveying. Surveys will be made of assigned plats, and descriptions prepared. Resurveys will be made where more than ordinary difficulty is encountered in the interpretation of descriptions and existing evidence.

Prerequisites: Math. 11 and C. E. 105.

The course in Highway and Irrigation Engineering and Landscape Gardening; freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods.

223. TOPOGRAPHIC SURVEYING. This course will include the execution of a complete topographic survey of an assigned tract including the base line measurement, transit, stadia, and plane table work, platting, and finishing the map.

Prerequisites: C. E. 222 and 105.

The courses in Highway Engineering, Irrigation Engineering and Landscape Gardening; sophomore year; first semester; 5 credits; 2 recitations; 3 laboratory periods.

225. CITY SURVEYING (Elective). A study of the necessary precision; a survey of a portion of the city; also a new addition including the preparation of plats, establishment of grades, etc. survey and office work for preparation of plans for street improvement; preparation of estimates, etc.

Senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

232. PLANE SURVEYING. In this course substantially the same ground will be covered as in course 222, except that there will be but two thirds as much field practice.

Prerequisites: Math. 11, 21, 31, and Mechanical Drawing.

The courses in Mining, Forestry, and Logging Engineering; freshman year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

233. TOPOGRAPHIC SURVEYING. A condensation of course 222 and in addition requires a rough topographic survey of a forested section.

Prerequisite: C. E. 232 or 222.

The courses in Forestry and Logging Engineering; sophomore year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

242. FARM SURVEYING AND LEVELING. This course is designed for Agricultural students, and consists of problems in chain and elementary transit work, and in leveling. Most emphasis will be put upon leveling and its application to drainage and general irrigation work. Problems will be given in profile and contour work as applied to farm drainage, road construction, and irrigation.

Agricultural course; sophomore year; second semester; 2 laboratory periods with assigned lectures.

243. **TOPOGRAPHIC SURVEYING.** This course is designed especially for those taking the Irrigation Farming course, and is an enlargement on C. E. 242. A complete topographic survey and map of an assigned area will be made. Special emphasis will be put on the study of the relation of surface topography to methods of water distribution, drainage, etc., as illustrated by the assigned survey and map. Methods of locating ditches and of making estimates on grading for the same will be studied from the contour map.

Prerequisite: C. E. 242.

Irrigation Farming course; junior year; first semester; 2 credits; 2 laboratory periods with assigned lectures where required.

251. **PLANE SURVEYING.** This is a condensation of course 222, and is designed to meet the needs of Mechanical and Electrical students who have not time for the longer course.

Elective; second semester; 3 credits; 2 laboratory periods; 1 lecture or recitation.

252. **PRECISE SURVEYING AND GEODESY.** A study of the precise methods of surveying and leveling, base line measurements, precise triangulation, determination of true meridian and latitude.

Prerequisites: C. E. 222, 223, 272.

Elective; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

272. **RAILROAD AND CANAL SURVEYING.** This course will include a study of the simple, compound, and vertical curves, and of earthwork. Students will solve many problems both in the class room and in the field, and will make a survey of a canal, highway, or railroad, including a reconnaissance, preliminary survey, location survey, and estimates of earthwork. Emphasis will be placed on yardage estimates, cross-sectioning and earthwork computations, and details of construction.

Prerequisites: C. E. 222 and 223.

Highway and Irrigation Engineering and Landscape Gardening; sophomore year; second semester; 5 credits; 2 recitations; 3 laboratory periods.

274. **RAILROAD SURVEYING.** This course is designed especially for the Logging Engineering course, and takes up the survey of a railroad line through rough wooded country, including the reconnaissance, preliminary, and location surveys of such a line. A com-

plete estimate of the yardage, and also of the cost of the line is made. The course also includes the study of the simple, compound, vertical, and transition curves.

Prerequisites: C. E. 232 and 233.

Course in Logging Engineering; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each.

281. RAILWAY ENGINEERING. Study of the methods of railway construction and maintenance, standard structures, trestles, tunnels, culverts, minor bridges, ballast, rails and rail supports and fastenings, yards and terminals. This course will be preceded by a brief review of the simple and compound curve and the railway spiral.

Prerequisite: C. E. 272.

Senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

282. RAILWAY ENGINEERING. Continuation of course 281.

Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

301. SANITARY ENGINEERING. Drainage systems of populous districts, including chemical and bacterial purification of sewage; collection and disposal of garbage; street cleaning; separate and combined water carriage systems; surveys, plans, and specifications; law of flow and determination of size and capacity; brick, terracotta, cement, and concrete sewers.

Prerequisite: I. E. 102.

Senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

405. ROADS AND PAVEMENTS. A study of the fundamental principles of location, construction, and maintenance of roads, as well as a thorough study of the materials used in road and street building. Asphalt, brick, wood block, stone, concrete, and other forms of street pavements are carefully studied. This course is given in connection with a laboratory course, Exp. E. 131.

The courses in Highway Engineering, Irrigation Engineering, and Landscape Gardening; junior year; first semester; 3 credits; 3 recitations.

407. HIGHWAY ENGINEERING. Economic grades and proper location for different soils and surfacing materials. Surface and

sub-surface drainage. Culvert design and construction. Construction and maintenance of earth, sand clay, oiled earth, gravel, macadam, concrete, brick, and other types of roads. Dust preventives and road binders. Preliminary surveys and estimates. Specifications.

Senior year; first semester; 4 credits; 3 lectures; 1 laboratory period.

408. HIGHWAY ENGINEERING. Continuation of course 407.

Senior year; second semester; 4 credits; 2 lectures; 2 laboratory periods.

410. ECONOMICS OF HIGHWAY CONSTRUCTION. Economic and social advantages of improved roads. The traffic census. Local and centralized systems of control. Highway laws of different states. Organization of construction and engineering forces. Cost data. Methods of handling work. Forms of contract—lump sum, unit price, percentage and cost plus fixed sum.

Senior year; second semester; 2 credits; 2 recitations.

511. GRAPHIC STATICS. The study of the graphic methods of the solution of stresses in cranes, derricks, and roof and bridge trusses, and such similar problems. The course is a draughting room course and is made up of a series of problems to be solved graphically and checked analytically.

The courses in Highway, Irrigation, and Mechanical Engineering; junior year; first semester; 2 credits; 2 laboratory periods of three hours each.

513. HIGHWAY BRIDGES. Design of wood and steel highway bridges and trusses of the ordinary Pratt or Howe truss type, including the complete design, stress diagram, and detail drawings of the same. Both analytical and graphical methods will be applied to the determination of stresses in trusses under static and wind loads, and under static, moving, concentrated, and distributed loads.

Prerequisites: M. E. 251, 252.

Senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each.

514. HIGHWAY BRIDGES. A continuation of course 513. Advanced work in highway bridge design is taken up, including draw, cantilever, suspension, and arch bridges.

Senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

515. **STRUCTURAL ENGINEERING.** This course will include the original design, with the stress sheets, plans, and working drawings for a roof truss, plate girder, pin-connected bridge and steel arch.

Senior year; first semester; 3 credits; 3 laboratory periods.

516. **STRUCTURAL ENGINEERING.** Continuation of course 515.

Senior year; second semester; 2 credits; 2 laboratory periods.

552. **MASONRY AND FOUNDATIONS.** A study of the properties of stone, brick, lime, cement, and concrete as building materials, and of their uses in foundations, retaining walls, piers, and dams; the theory of the masonry arch, retaining wall and dam. Recitations, lectures, and work in draughting and computing room.

The courses in Highway Engineering and Irrigation Engineering; junior year; second semester; 3 credits; 3 recitations.

553. **REINFORCED CONCRETE.** A study of the fundamental principles of reinforced concrete design as applied to beams, girders, and columns. Designs are made of beam, girder, slab, and arch reinforced concrete highway bridges, and also of reinforced concrete retaining walls and irrigation structures. A detailed drawing is prepared of one reinforced concrete highway bridge.

The courses in Highway and Irrigation Engineering; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

555. **DESIGN OF HIGHWAY STRUCTURES.** A draughting room course in the design of different kinds of structures required in highway work. It includes the design of short span reinforced concrete slab bridges, short span I-beam bridges, culverts, tunnels; retaining walls for side hill roads, etc. A study will be made also of the effect of drainage of roads and drainage areas upon the design of bridges.

Highway Engineering course; elective; senior year; 2 credits; 2 laboratory periods.

605. **ENGINEERING SEMINAR.** The members of the senior class in the courses in Highway and Irrigation Engineering, and the professors and instructors, constitute the Engineering Seminar, which meets once a week. The purpose of this seminar is to bring the student in touch with engineering literature and practice. To

this end, a number of journal reviews and papers on engineering subjects will be presented and freely criticised each week. The work will follow a previously arranged program.

Senior year; first semester; 1 credit.

606. ENGINEERING SEMINAR. See course 605.

Senior year; second semester; 1 credit.

607. CONTRACTS AND SPECIFICATIONS. A study of the general principles and laws of contracts as applied to engineering, including the preparation and study of specifications and contracts based upon engineering structures designed by the individual student.

Senior year; second semester; 2 credits; 2 recitations.

ELECTRICAL ENGINEERING

PROFESSOR DEARBORN

PROFESSOR HILLEBRAND

ASSISTANT PROFESSOR SHEPARD

MR. WOOSTER

The following courses are offered:

101. PRINCIPLES OF APPLIED ELECTRICITY. Study of the sine wave and periodic alternating quantity; harmonic analysis; laws governing the flow of current and energy; the magnetic and electrostatic circuit, production of rotating field by means of polyphase alternating currents in a distributed winding; losses in electric circuits; elementary theory of transmission lines.

Open only to juniors in Electrical Engineering. Course 101 must be taken concurrently with 201, and 102 concurrently with 202.

Junior year; first semester; 5 credits; 5 recitations.

102. PRINCIPLES OF APPLIED ELECTRICITY. Continuation of course 101.

Junior year; second semester; 3 credits; 3 recitations.

103. ALTERNATING CURRENT MACHINERY. Theory of commutation; the alternator; synchronous motor and converter; transformer; induction motor; series and repulsion motors; polarity in alternating current circuits.

Course 103 may only be taken concurrently with laboratory course 203.

Prerequisites: Courses 101, 102, 201, 202.

Senior year; first semester; 3 credits; 3 recitations.

105. PROBLEMS IN DESIGN. Stress is laid upon methods of calculating dimensions of predetermining characteristics. Study of the choke coil, electro magnet, static transformer, one rotating machine. Problems on the synchronous and induction motor, transmission and distribution of energy. Parallels course 103.

Prerequisites: Courses 101, 102, 201, 202.

Senior year; first semester; 2 credits; 2 laborataory periods.

106. PROBLEMS IN DESIGN. Continuation of course 105.

Senior year; second semester; 2 credits; 2 laboratory periods.

108. POWER PLANTS, TRANSMISSION AND DISTRIBUTING SYSTEMS. A study of the equipment of power plants, transmission lines, and distributing systems, and of the technical and economic problems connected with the generation, transmission, and distribution of electrical energy.

In connection with this course inspection trips are made to the neighboring properties of the Oregon Power Company and of the Portland Railway, Light & Power Company. The expense of these trips will approximate twenty dollars, and should be anticipated by every Electrical Engineering student in his senior year.

Prerequisite: Course 103.

Senior year; second semester; 3 credits; 3 recitations.

110. ELECTRICAL CONTRACTING. Study of appliances handled by electrical supply dealers, the National Electrical Code, plans and specifications for interior wiring, systems of cost keeping, and economic features of the supply business.

Prerequisite: Course 103.

Elective only to seniors in Electrical Engineering who plan to engage in the electrical supply business, who may take it in lieu of course 108.

Senior year; second semester; 3 credits; 3 recitations.

201. ELECTRICAL ENGINEERING LABORATORY. Open only to juniors in Electrical Engineering and must be taken concurrently with 101, which it parallels. Study of electrical instruments; wave form and polarity of alternatng currents; current, electromotive force and power relations in circuits involving resistance, inductance, and capacity; principles of operation of direct current dynamos and motors.

Consists of one laboratory period a week. Student is required to submit a preliminary report before performing experiment, and a final report upon its completion.

Junior year; first semester; 3 credits; 1 laboratory period.

202. ELECTRICAL ENGINEERING LABORATORY. Continuation of course 201. Must be taken concurrently with course 102. Study of hysteresis and eddy current losses in magnetic circuits, electromotive force and energy losses in electrical circuits; the separation of losses in direct current machinery; efficiency and loading tests of direct current machinery; properties of insulating materials.

Junior year; second semester; 3 credits; 1 laboratory period.

308. ELECTRIC RAILWAYS. A general study of the application of electricity to street and interurban railways, covering traffic conditions, speed, time, curves, and rolling stock.

Prerequisite: E. E. 101, 120, 201, 212, or E. E. 402.

Required of seniors specializing in railway electrical engineering.

Senior year; first semester; 2 credits; 2 recitations.

309. ELECTRIC RAILWAYS. Continuation of course 308. A study of conditions governing the electrification of trunk lines; systems of electrification and transportation economics.

Prerequisite: E. E. 308.

Required of seniors specializing in railway electrical engineering.

Senior year; second semester; 3 credits; 3 recitations.

312. RAILWAY SIGNALLING. A course in block signalling, interlocking air brakes, and appliances.

Prerequisite: E. E. 309.

Required of seniors specializing in railway electrical engineering.

Senior year; second semester 2 credits 2 recitations.

203. ELECTRICAL ENGINEERING LABORATORY. Characteristic performance of alternating current machinery, including alternator, synchronous and induction motor, synchronous converter and static transformer with parallel operation and pump back tests.

Preliminary and final reports are required.

Prerequisites: Courses 101, 102, 201, 202.

Senior year; first semester; 3 credits; 1 laboratory period.

301. STUDY OF CURRENT PERIODICAL LITERATURE. Presentation of abstracts and discussion of current articles in electrical periodicals. Special emphasis will be laid upon English, address, and manner of presentation.

Elective to seniors in Electrical Engineering.

Senior year; first semester; 1 credit; 1 recitation.

This course will not be given unless elected by at least four students.

304. STORAGE BATTERIES. Theory and operation of commercial types of storage battery; engineering application as a power plant auxiliary.

Elective to seniors in Electrical Engineering.

Senior year; second semester; 1 credit; 1 lecture.

306. THESIS. Elective, by permission, to seniors in Electrical Engineering. Only those whose past record indicates ability successfully to complete a satisfactory thesis, will be permitted to make this election.

Senior year; second semester; 2 or 3 credits.

402. STUDY OF ELECTRICAL MACHINERY. Open to non-electrical students in the School of Engineering. A practical course designed to meet the needs of Civil, Mechanical, and Mining Engineers. Class room and laboratory study of electrical instruments, current, electromotive force and power relations; the operation, care, and management of familiar types of dynamos, motors, both alternating and direct current, and transformers.

Required of seniors in Mechanical and Mining Engineering and of certain groups in Civil Engineering.

Prerequisites: Elementary Chemistry, Physics, Calculus, Mechanics.

Junior or senior year; second semester; 4 credits; 2 recitations; 1 laboratory period.

MECHANICAL ENGINEERING

PROFESSOR COVELL

ASSOCIATE PROFESSOR PHILLIPS

ASSISTANT PROFESSOR ROSENCRANTS

MR. YODER

The following courses are offered:

151 MECHANICAL DRAWING. The use of instruments and the elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, the

helix with its application to screw-threads, and finally the complete development of a working blue print of some simple device from sketches. Particular attention is given to free-hand lettering, general neatness, and accuracy.

The courses in Electrical, Mechanical, and Logging Engineering; freshman year; first semester; 2 credits; 2 laboratory periods.

152. **DESCRIPTIVE GEOMETRY.** This work consists in the graphical solution of problems involving the projection of lines, surfaces, and solids.

All courses in Engineering; freshman year; first or second semester; 3 credits; 2 recitations; 2 laboratory periods.

153. **MECHANICAL DRAWING.** A continuation of course 151, including mechanical lettering, line shading, isometric and oblique projection, gear curves and their application to spur, bevel, and worm gearing. Following this is the preparation of a typical set of working drawings, tracings, and blue prints of a complete machine. Rapid and business-like execution of work is insisted upon at all times.

The courses in Electrical and Mechanical Engineering; sophomore year; first semester; 3 credits; 3 laboratory periods.

156. **DRAWING.** A course in elementary mechanical drawing, taught by a series of practice sheets in geometric construction, orthographic projection, of simple parts of machines, and finally, complete working drawings and blue prints of simple apparatus or machines.

The course in Industrial Arts; sophomore year; second semester; 3 credits; 2 laboratory periods.

204. **MECHANISM.** A study of mechanical movements, including velocity ratios; transmission of motion by linkwork, gearing, cams, and belting.

The courses in Electrical and Mechanical Engineering; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

The course in Logging Engineering; junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

205. **MACHINE DESIGN.** This course consists largely in applying the principles discussed in mechanism and in mechanics to the design of machine parts. The work includes among other things

the study of screws, fastenings, shafting, belting, fly wheels, wheels, gearing, and machine frames.

Senior year; first semester; 4 credits; 4 recitations.

206. MACHINE DESIGN. This course supplements and is directly dependent upon the recitation work of course 125.

The work is taken up from a practical point of view and applies such theory as is consistent with the approved methods of design. Designs and complete working drawings are made of machines.

Senior year; second semester; 3 credits; 3 laboratory periods.

251. STATICS AND DYNAMICS. This is essentially a course in theoretical and applied mechanics. Force systems are analyzed and their effects upon rigid bodies, both at rest and in motion, are carefully studied. Methods of finding centers of gravity and moments of inertia are investigated, and their practical applications brought to the student's attention by solving a number of problems. The principles of work, energy, friction, and impact, are also studied with reference to their importance in the field of engineering.

Prerequisites: Differential and Integral Calculus, Math. 51, 52.

All courses in Engineering; junior year; first semester; 4 credits; 5 recitations.

252 STRENGTH OF MATERIALS. In this course the general principles of mechanics are applied to the elements of engineering structures to determine their strength and fitness.

Some of the features are tensile and crushing strength of different engineering materials; strength and stiffness of beams or girders under different systems of loading, and various methods of support; supporting power of posts or columns; the application of torsion to shafts as a means of transmitting power.

The work throughout is exemplified by numerous problems which the student is required to solve.

Prerequisite: Statics and Dynamics, M. E. 251.

All courses in Engineering; junior year; second semester; 4 credits; 3 recitations.

302. ROAD MACHINERY. This course is designed to familiarize the student with the purpose, care, and manipulation of the different forms of power driven road machinery, both steam and gas, as exemplified in modern road construction.

The course in Highway Engineering; senior year; first semester; 1 credit; 1 laboratory period.

303. **ELEMENTARY STEAM ENGINEERING.** This course deals with the principles of steam engineering in a very elementary manner. Its purpose is to familiarize the student with the type of steam machinery largely used in the logging industry, such as donkey engines and logging locomotives.

A portion of the time will be spent in the class room studying the principles of steam formation and power development. A part of the time will be devoted to laboratory work, involving the care and management of the engines and boilers, as well as the use of the steam engine indicator in valve setting and power measurement.

The course in Logging Engineering; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

305. **THEORY AND PRACTICE OF STEAM ENGINEERING.** This course includes a study of the elementary thermodynamic laws of gases and vapors with reference to their application to engineering practice, and aims to fulfill the essential thermodynamic requirements of the gas and steam engineer. The work will be supplemented throughout with problems.

Prerequisites: Differential and Integral Calculus, Math. 51, 52.

The courses in Mechanical and Electrical Engineering; junior year; both semesters; 3 credits; 3 recitations.

306. **ADVANCED STEAM ENGINEERING.** A continuation of course 305, in which more time is spent on the application of the principles of thermodynamics to power plant machinery and to a study of the interrelation of power plant apparatus, including steam prime movers and boilers and their auxiliaries.

The courses in Mechanical and Electrical Engineering; senior year; both semesters; 3 credits; 3 recitations.

309. **STEAM BOILERS.** A study of the construction and operation of steam boilers, superheaters, economizers, heaters, boiler feeding devices, oil burning devices, and chimneys. It is the aim of this course to familiarize the student with modern methods and apparatus involved in the economic generation of steam.

Prerequisite: Course 305.

The course in Mechanical Engineering; senior year; first semester; 2 credits; 2 recitations.

312. STEAM TURBINES. The steam turbine has taken its place as one of the important factors in transforming energy into work. Hence the principles involved in its construction and operation should be well understood by engineering students. This course considers the flow of steam through pipes and nozzles and its action on turbine buckets. The effects of superheating are noted and some attention is given to steam turbine design.

Senior year; second semester; 2 credits; 2 recitations.

316. STEAM POWER PLANT DESIGN. The work in this course includes the design and working drawings of steam power plant problems. Among other things considered, are the location of plants; the selection of engines, boilers, pumps, and heaters; the general arrangement of parts, including the connections, piping, and auxiliaries.

The course in Mechanical Engineering; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

325. COMPRESSED AIR AND REFRIGERATION. A course devoted to the theory, design, and operation of air compressors, fans, and blowers, the first part of the semester, and to the study of the theory and operation of commercial refrigeration systems the latter part.

Prerequisite: Course 305.

Elective in the senior year of the Mechanical and Electrical Engineering courses; first semester; 2 credits; 2 recitations.

331. HEATING AND VENTILATING. Study of modern methods for the heating and ventilating of buildings. An outline of the work includes a study of several approved systems of heating by means of steam, hot water, or air; methods of computing radiating surface; effective methods of ventilation; general design, construction, and operation of plant.

The course in Mechanical Engineering; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

346. INTERNAL COMBUSTION MOTORS. In this course the application of thermodynamics to the internal combustion engine cycles, is studied with reference to the economy of operation. The theory of the combustion of gases and of the gasification of the liquid and solid fuels commonly met with in internal combustion engine practice, is discussed. The remainder of the time is devoted to a study of details, auxiliaries, and operation.

Prerequisites: Courses 305, 306.

Course in Mechanical Engineering; senior year; second semester; 2 credits; 2 recitations.

351. SEMINAR. The seminar meets once each week to study progress and development in the field of mechanical engineering. Technical literature will be reviewed; assignments will be made in advance, covering new or special features of engineering work. Students are required to submit carefully prepared reports, criticisms, or comments.

The course in Mechanical Engineering; senior year; first semester; 1 credit; 1 recitation.

352. SEMINAR. A continuation of course 351.

The course in Mechanical Engineering; senior year; second semester; 1 credit; 1 recitation.

EXPERIMENTAL ENGINEERING

PROFESSOR GRAF

MR. KNOFF

MR. BOALS

The courses in engineering laboratory practice are designed to familiarize the student with processes of investigation; to afford experience in conducting and reporting experimental engineering work; to secure data which shall verify and supplement theoretical instruction; and, to some extent at least, to give a practical knowledge of construction and management of machinery and apparatus.

Appropriate divisions of this work are taken by students in all branches of Engineering, Forestry, and Industrial Arts, and in that sense the Experimental Engineering laboratories constitute a service department. Special courses are offered, as listed in what follows, to meet the needs of the students in the different lines of work. An earnest effort is made, not so much to impart a mass of detail, as to develop in the student his powers of observation and his capacity for independent thought.

Reports are required of all experiments, and are regarded as a most important part of the work. They are carefully read and criticised as to form, neatness, conciseness, accuracy of expression and spelling, as well as accuracy of technical data and calculations. With this training, when the student completes the work, he should

know how to prepare an acceptable engineering report, or how to arrange data for publication.

201. APPLIED MECHANICS LABORATORY. A study of experimental investigation, reduction of data, mechanical calculating devices, and the preparation of neat, concise, and accurate reports. The calibration of various measuring instruments such as gauges, pyrometers, transmission dynamometers, etc., is then taken up. After this follow exercises in the measurement of power, including a test of the transmitting capacity and slip of belting. Transverse tensile, compressive, torsion, and other standard tests of the common materials of construction are made; the heating value of a sample of coal is determined; the course being then concluded by two exercises on the properties of an assigned lubricating oil.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. Statics & Dynamics, (M. E. 251), and Theory and Practice of Steam Engineering, (M. E. 305), must also be taken in conjunction with this course.

Course in Mechanical Engineering; junior year; first semester. 3 credits apportioned as follows: preparation, $\frac{1}{2}$ credit; laboratory, 1 credit; report, $1\frac{1}{2}$ credits.

202. POWER AND HYDRAULIC LABORATORY. A continuation of course 201, beginning with the use and calibration of the indicator and planimeter. Tests are then made on steam and gas engines, boiler, an impulse water wheel, pumps, an air compressor, and other power equipment. Exercises are given in the setting of Corliss and slide valves, and the course is concluded with an economical test of a steam turbine operating condensing.

This work is covered in fifteen laboratory exercises, one each week, and a careful report of each experiment is required.

Prerequisite: Course 201. Advanced Steam Engineering, (M. E. 306), must be taken in conjunction with this course.

Course in Mechanical Engineering; junior year; second semester; 3 credits, apportioned as for course 201.

203. ADVANCED MECHANICS LABORATORY. A rather general course in experimental mechanics dealing with more advanced studies of materials, fuels, lubricants, bearing metals, belting, etc., with special reference to the application of the results to the requirements of the mechanical engineer in actual practice. Report required.

Prerequisites: Courses 201 and 202.

Course in Mechanical Engineering; senior year; first semester; 3 credits, apportioned as for courses 201 and 202.

204. **ADVANCED POWER LABORATORY.** A course similar in nature to the preceding, but dealing with power and hydraulic machinery. Various tests and studies are made on the following: a triplex pump, an air compressor, a centrifugal blower, a steam turbine, a compound engine, and finally, a complete test of a simple condensing Corliss engine, including the heat balance and a verification of Clayton's analysis. Complete reports required.

Prerequisite: Course 203.

Course in Mechanical Engineering; senior year; second semester; 3 credits; apportioned as for the preceding.

205. **APPLIED MECHANICS LABORATORY.** Fifteen experiments consisting of exercises selected from courses 201 and 203. A course designed especially for the seniors in Electrical Engineering.

Prerequisites: All of the Mechanical Engineering courses required of Electrical Engineering juniors. Advanced Steam Engineering (M. E. 306), should be taken in conjunction.

Course in Electrical Engineering; senior year; first semester; 3 credits, distributed as for course 201.

206. **POWER AND HYDRAULIC LABORATORY.** Similar in grade and purpose to the preceding. Consists of exercises selected from courses 202 and 204.

Prerequisite: Course 205.

Course in Electrical Engineering; senior year; second semester; 3 credits, apportioned as in the preceding.

207. **APPLIED MECHANICS LABORATORY.** This course is similar in range of equipment studied to course 201, but since it is intended for students in the Industrial Arts course who do not have some of the theoretical work in power engineering, the work must necessarily be taken up in a more general and elementary manner. Some time is taken to explain the necessary principles, and the students are taught to prepare neat and accurate reports of their work.

Prerequisites: Math. 11, and Phys. 1 and 2.

Course in Industrial Arts; senior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 1 credit.

208. **POWER AND HYDRAULIC LABORATORY.** A course similar in grade to the preceding, designed for seniors in the Ceramic Engineering and Industrial Arts courses. The work consists of ten laboratory exercises selected from course 202. The usual reports are required.

Prerequisite: Course 207 for Industrial Arts, and Course 237 for Ceramics.

Required in Ceramics and Industrial Arts; senior year; second semester; 2 credits, apportioned as for course 207.

210. **GENERAL ENGINEERING LABORATORY.** A course designed for seniors in Mining Engineering, or for others who desire a brief, comprehensive course in mechanical laboratory practice. The work consists of ten exercises selected from courses 201 and 202, and embraces tests on materials, hydraulic machinery, and steam and gas engines. Reports are required as in the preceding.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52.

Course in Mining Engineering; senior year; first semester; 2 credits, apportioned as for course 207.

231. **CEMENT AND HIGHWAY LABORATORY.** An experimental study of Portland cement; standard A. S. C. E. methods of cement testing; examination of sands, grading of aggregates, determination of voids, etc., abrasion, hardness, toughness, cementing value, and other tests on macadam rock; tests of paving brick; standard tests on bituminous compounds.

This course is of broad scope, but is still sufficiently detailed to give the student a good working basis for the intelligent interpretation and preparation of specifications for the materials treated.

Prerequisites: Phys. 101 and 102 and Math. 51 and 52. Roads and Pavements, (C. E. 405) should be taken in conjunction with this course.

Courses in Highway Engineering and Irrigation Engineering; junior year; first semester; 2 credits, apportioned as follows: laboratory, $\frac{2}{3}$ credit; preparation and report, $1\frac{1}{3}$ credits.

232. **STRUCTURAL MATERIALS LABORATORY.** Standard tests of timber, iron, steel, brick, stone, etc., with special reference to the methods and specifications adopted by the American Society for Testing Materials, and other national engineering organizations. Following the general tests, some time is devoted to work on plain and reinforced concrete.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. This course should be preceded by course 231, and Strength of Materials (M. E. 252), should be taken in conjunction with it.

Courses in Highway and Irrigation Engineering; junior year; second semester; 3 credits, apportioned as follows: laboratory, 1 credit; preparation and report 2 credits.

233. ADVANCED HIGHWAY LABORATORY. Following course 231, and designed particularly for those specializing in Highway Engineering. Different road and paving materials and binders are tested and their relative values determined. Sheet asphalt mixtures and bituminous mortars are studied, to determine the effects of various changes in the grading of the aggregates. Finally, samples of various types of roads and pavements are analyzed for density, composition, and grading, with special reference to their conformity with specifications under which built.

Prerequisites: Course 231, and C. E. 405.

Course in Highway Engineering; senior year; first semester; 2 credits; apportioned 1 to laboratory work and 1 to report.

235. ADVANCED MATERIALS LABORATORY. An advanced course offered as an elective to students who have completed course 232, and who desire additional laboratory work on materials. In the past, tests have been made on reinforcing steel, reinforced beams, hooped columns, water-proofing of concrete, thermal conductivity of concrete, etc., but the course is varied according to the special interests and desires of the students electing the work.

The course on Reinforced Concrete (C. E. 553), must either precede this course or be taken at the same time. The course cannot be given unless elected by at least five students.

Either semester as desired by majority; 2 credits: laboratory, 1 credit; report, 1 credit.

237. MATERIALS TESTING LABORATORY. A course planned for students in Ceramics. The work begins with the standard tests on Portland cement, and the examination of sand and concrete aggregates. Some time is then devoted to tests on brick, drain tile, and other clay products, after which bending, tension, and compression tests are made on some of the general materials of construction such as wood, iron, steel, etc. The course comprises ten laboratory exercises for each of which a neat, concise report is required.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52.

The course in Ceramics; senior year; first semester; 2 credit laboratory, 1 credit; preparation and report, 1 credit.

238. **TIMBER TESTING.** A special course designed to meet the requirements of the students in Forestry. The work is covered in eight laboratory exercises, embracing cross-bending, compression shearing, cleavage, and other standard tests of timber; a study of the effect of moisture content on strength; and a study of impact loads. The formulas for the reduction of data from tests are explained; and the students are taught the preparation of neat, accurate reports, such being required on all tests. In general, the methods and bulletins of the U. S. Forest Service will be used as a guide in the work.

Prerequisites: Phys. 1 and 2.

Course in Forestry; senior year; second semester; 1 credit.

NOTE: The work is covered in one three-hour laboratory period per week during the first half of the semester, for which one-half credit is allowed. The other half credit is given for the reports.

240. **LOGGING MATERIALS.** A course for students in Logging Engineering, identical for the first half of the semester with course 238. During the second half of the semester studies and tests are made on the materials of particular interest to the logging engineer, as for example, bending tests on full size timbers, tension tests on cable, rope, and on wrought iron tie rods, etc. In all these experiments time is taken to explain the principles involved, and to point out their practical applications.

Prerequisites: Phys. 101 and 102.

Course in Logging Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit.

262. **HYDRAULIC LABORATORY.** Study of methods of measuring water, calibration of weirs, orifices, water meters, etc. Determination of friction and loss of head in pipe lines and fittings. Study of water hammer, and test of hydraulic ram. Tests on water wheel, centrifugal, triplex, and other pumps. The work is covered in fifteen three-hour laboratory exercises, and a report of each test is required.

Prerequisites: Math. 51 and 52, and I. E. 102.

Course in Irrigation Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit.

272. **GAS ENGINE LABORATORY.** Study of mechanical details of engines, battery and magneto ignition systems, carburetors, and methods of governing. Analysis of gas engine cycles from indicator diagrams. Mechanical efficiency, regulation, and fuel economy tests. Economy, power, and tractive effort of automobiles.

The work is covered in fifteen laboratory exercises, and a report is required for each.

Prerequisite: The course on Internal Combustion Motors (M. E. 346), must either precede the course, or be taken in conjunction with it.

Course in Mechanical Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit.

291. **EXPERIMENTAL RESEARCH PROBLEMS.** An opportunity is given for advanced and suitably prepared students who are interested in engineering research, to work out original problems. These may be either of their own choosing, or suggested by the department, and may cover any subject within the scope of the department laboratories.

Prerequisites: Must be approved in each case, as they would vary with the work proposed.

Elective to seniors and graduate students; first semester; 2 credits.

292. **EXPERIMENTAL RESEARCH PROBLEMS.** A continuation of course 291.

Elective to seniors and graduate students; second semester; 2 credits.

IRRIGATION ENGINEERING

PROFESSOR TEETER.

The following courses are offered:

101. **HYDRAULICS.** A practical application of the principles of hydraulics to irrigation farming, arranged especially for agricultural students. It includes a study of the laws of water pressure in tanks, pipes, and flumes; the measurement of water by weirs, orifices, and current meters; the study of losses of head in pipes and the consequent effect on the discharge.

Elective for seniors in Agriculture; senior year; first semester; 3 credits; 2 lectures; 1 three-hour laboratory period.

102. **HYDRAULICS.** A technical course dealing with the elementary laws of liquids in motion and at rest; the weight and pressure of water on gates and dams; velocity and discharge through orifices, tubes, pipes, and flumes; fluid friction, losses of head, and time of emptying reservoirs.

Prerequisite: M. E. 251.

Required of juniors in Highway, Irrigation, Electrical and Mining Engineering; junior year; second semester; 3 credits; 3 lecture periods.

103. **HYDRAULICS.** A course similar to I. E. 102, including the dynamic action of jets and streams, elements of turbines, and water hammer.

Prerequisite: M. E. 251.

Required of seniors in Mechanical Engineering; senior year; first semester; 3 credits; 3 lecture periods.

202. **HYDRAULIC PUMPS AND MOTORS.** The application of the principles of hydraulics to the design, construction, and operation of pumps and water wheels; the various forms of wheels and pumps, their adaptability, and efficiency.

Prerequisite: Hydraulics, I. E. 102.

Required of seniors in Irrigation Engineering; senior year; second semester; 2 credits; 2 lecture periods.

204. **WATER POWER.** A general study of the development of water power on streams; the effect of pondage, storage, and load factor on the capacity and efficiency of the plant and equipment; a detailed study of the characteristics of modern water turbines, together with an investigation of the speed regulation and manner of governing large plants. Extensive numerical problems will be required of the students in this course.

Prerequisite: Water Supply Engineering, I. E. 301.

Elective for seniors or graduates in Irrigation Engineering; senior year; second semester; 3 credits; 3 lecture periods.

301. **WATER SUPPLY ENGINEERING.** This course consists of preliminary investigations for determining the available supply of water for irrigation and domestic purposes; a study of general hydrology, steam gauging, the use of the mass diagram in the study of storage; ground water resources the sources of water supplies; manner of conveying and storing water; requirements for

fire protection; the economics of pumping and the proper installation of pumping plants. The solution of extensive numerical problems is required of the student.

Prerequisites: C. E. 511, I. E. 102.

Required of seniors in Irrigation Engineering; senior year; first semester; 4 credits; 3 recitations; 1 laboratory period of three hours.

401. IRRIGATION ENGINEERING. Precipitation, run-off, underground flow, sedimentation, fluctuation of stream flow, methods of determining losses due to evaporation and seepage; the phenomena of water logging alkali deposits and drainage; the duty of water in all its phases; irrigation by pumps; the location of irrigation systems; diversion weirs, headgates, flumes and drops—these are the principal features dealt with in this course. A study is made of the methods practiced in other countries.

Prerequisite: I. E. 102.

Required of seniors in Irrigation Engineering; senior year; first semester; 2 credits; 2 lecture periods.

402. DESIGN OF IRRIGATION STRUCTURES. This course deals with the storage and conveyance of water; the design of headworks and flumes; the selection of dam sites; investigations of the stability of dams in use; the design of a dam by Wegman's method; the design of pipe lines, earthen dams, and reservoirs; the design of flash boards and movable dams, hollow dams, and their application to storage and pondage. This course consists entirely of numerical problems with occasional lectures on the solution of the same.

Prerequisites: C. E. 511, I. E. 401, and I. E. 102.

Required of seniors in Irrigation Engineering; senior year; second semester; 2 credits; 2 three-hour laboratory periods.

501. DRAINAGE ENGINEERING. This course deals with the design of large drainage systems, open ditch construction, dredging and cleaning of large drainage channels, the drainage of alkali lands, etc.

Prerequisite: I. E. 102.

Elective for seniors in Highway and Irrigation Engineering; senior year; 2 credits; 2 lecture periods to be arranged.

602. **WATER LAW.** A study of the development of the water laws of Oregon with reference to the appropriation of water for large power and irrigation projects; the basis of the right of appropriation, patentees, and appropriator; waters subject to appropriation, and the transfer of rights.

Prerequisites: I. E. 401 and I. E. 301.

Required of seniors in Irrigation Engineering; senior year; second semester; 1 credit; 1 lecture period.

INDUSTRIAL ARTS

PROFESSOR BRANDON

MR. PORTER

MR. RIDENOUR

MR. McCOMB

MR. WILTSHIRE

MR. THAYER

MR. MADDISON

MR. ———

A-1. **VOCATIONAL DRAWING.** In each of the vocational courses the student spends six hours per week in drawing, closely related to the major work which he is pursuing. The beginning work is devoted to learning the elements of drawing, general use of the drawing instruments, lettering, general constructions, methods of representation, and free-hand sketching. An attempt is made to correlate closely the work in drawing with the work in the shops. In plumbing, the work consists in making details of lead joints, fittings, and connections of sinks, closets, lavatories; preparations of floor plans and cross sections of buildings, showing plumbing installations. In patternmaking the drawing consists in making detail sketches of simple patterns, such as flanges, plates, brackets, hand wheels, stands, supports, and pieces of machinery such as are being built in the College shops. For students in the Electrical course, the drawing of details of dynamo electrical machine parts, such as pole pieces, commutators, switches, general switch board and power house layouts, is required. In the machinist's course, the work is along the line of details of machine parts, bolts, nuts, screws, and screw threads, assembled drawings of simple machines and machinery tools, steam and gas engine parts, and other machinery. In carpentry, details of furniture construction, of build-

ings, bridges, etc., form a prominent part of the course. For students of forging and foundry practice, drawing similar to that given to machinists and patternmakers respectively, is required.

Vocational course; Mechanic Arts; first year; first semester; 2 credits; 3 laboratory periods per week.

B-1. VOCATIONAL DRAWING. Continuation of A-1; first year; second semester; 2 credits; 3 laboratory periods per week.

A-2. VOCATIONAL DRAWING. Continuation of B-1; second year; first semester; 2 credits; 3 laboratory periods per week.

B-2. VOCATIONAL DRAWING. Continuation of A-2; second year; second semester; 2 credits; 3 laboratory periods per week.

A-3. VOCATIONAL DRAWING. Continuation of B-2; third year; first semester; 2 credits; 3 laboratory periods per week.

B-3. VOCATIONAL DRAWING. Continuation of A-3; third year; second semester; 2 credits; 3 laboratory periods per week.

C-1. CARPENTRY AND CABINETMAKING. The purpose of this course is to teach the pupil the elements of joinery as applied in cabinetmaking and the building trades. The beginning work is devoted to the principles of joining and to tool operations as involved in furniture making and interior finish, including design and construction, the proper use of tools, growth and strength of woods, shrinkage, warpage and seasoning of timber, staining and polishing. Considerable attention is given to the making of working drawings of simple pieces of furniture which are built in the shops. A study of the steel square and its uses is taken up the second and the third years, and the practical uses of the square are given in brace and detailed roof construction. This work will be developed through the construction of parts of houses, barns, roofs and bridges. In like manner, the construction of cornices, gutters, brackets, columns, window frames, and stairways is attempted. The erection of buildings in reduced scale and full sized sections of buildings is a strong feature of the course.

Supplementary lectures will be given upon the proper care of edged tools; the various woods used in building construction, their proper selection and treatment; the measurement of lumber, glues, nails, screws, bolts, nuts, pins, straps, and other fastenings. Roof trusses, spans, and braces and method of calculating their proper sizes; stair building, woodworking machinery, paints, shel-

lacs, and varnishes; estimates and practice in working problem that are taken from the students' work, from trade journals and from actual plans and specifications of houses. These are some of the prominent features of the work.

Vocational Course; Mechanic Arts; first year; first semester 4 credits; 6 laboratory periods per week.

D-1. CARPENTRY AND CABINETMAKING. Continuation of C-1 first year; second semester; 4 credits; 6 laboratory periods per week.

C-2. CARPENTRY AND CABINETMAKING. Continuation of D-1 second year; first semester; 4 credits; 6 laboratory periods per week.

D-2. CARPENTRY AND CABINETMAKING. Continuation of C-2; second year; second semester; 4 credits; 6 laboratory periods per week.

C-3. CARPENTRY AND CABINETMAKING. Continuation of D-2; third year; first semester; 4 credits; 6 laboratory periods per week.

D-3. CARPENTRY AND CABINETMAKING. Continuation of C-3; third year; second semester; 4 credits; 6 laboratory periods per week.

E-1. PATTERNMAKING. The purpose of this course is to teach the elements of machine patternmaking. The student begins his course with exercises involving the use of bench tools, and the reading of working drawings. These exercises emphasize the necessity of draught, core prints, core boxes, of allowance for shrinkage of iron and other metals, and its effect on different shapes and thicknesses of castings. The student is taught how to join timber to prevent warpage and distortion of patterns by using segments, staves, ribs, etc. He is taught the meaning of trade names, such as boss, fillet, flanges, ribs, etc.; how to operate power machinery; to keep in repair belts and line shafting; to sharpen planer, shaper, and jointer, knives, band saws; and how to select materials, such as glue, lumber, shellac, and fasteners.

Much of the constructive work is upon parts of machines that are being built in the College shops, such as pulleys, pipes, fittings, valves, gear wheels, dynamo frames, lathes, emery grinders, gas engines, and other machinery.

More advanced work includes the calculation, laying out, and construction of globe valves; spur, bevel, and worm gearing propeller blades and cams.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 6 laboratory periods per week.

F-1. PATTERNMAKING. Continuation of E-1.

First year; second semester; 4 credits; 6 laboratory periods per week.

E-2. PATTERNMAKING. Continuation of F-1.

Second year; first semester; 4 credits; 6 laboratory periods per week.

F-2. PATTERNMAKING. Continuation of E-2.

Second year; second semester; 4 credits; 6 laboratory periods per week.

E-3. PATTERNMAKING. Continuation of F-2.

Third year; first semester; 4 credits; 6 laboratory periods per week.

F-3. PATTERNMAKING. Continuation of E-3.

Third year; second semester; 4 credits; 6 laboratory periods per week.

G. WOODWORKING. This is a course in woodworking, including instruction in the care and use of bench tools. The student becomes an adept in the use of the steel square by exercises in brace and rafter cutting and roof framing, followed by lectures on various types of barn constructions. The practical work involves the construction of models of roofs, trusses, buildings, and parts of buildings reduced in scale.

Vocational course in Agriculture; first year; first semester; 2 credits; 3 laboratory periods.

J-1. COURSE IN FORGING. The purpose of this course is to teach the principles of forging as applied in the average jobbing shop. It deals with the method of building of fires so as to obtain best results in heating; care and operation of fires and forges; the use of tools in the working out of nuts, bolts, bending of eyes, forging staples, gate hooks; bending and welding of rings and links; making of hooks, clevises, and the parts of wagons and farm machinery; the forging of tools of high carbon steel and high speed

steel such as chipping chisels, lathes, shapers, planers, and mill tools; blacksmith's and mechanic's hammers; knives, hatchets, draw knives, and other tools.

Special attention is given to the composition of iron and the various low and high speed carbon steels; and the treatment especially adapted for each grade, to annealing, tempering, and case hardening, with some lectures on the history and production of iron.

The student will have opportunity to get practical repair work on machinery brought in from the College farm—such work as plow sharpening, wagon and machine repairing. In fact, he will come in contact with most of the work that is done in an average jobbing shop.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 6 laboratory periods.

K-1. COURSE IN FORGING. Continuation of J-1.; first year; second semester; 4 credits; 6 laboratory periods.

J-2. COURSE IN FORGING. Continuation of K-1; second year; first semester; 4 credits; 6 laboratory periods.

K-2. COURSE IN FORGING. Continuation of J-2; second year; second semester; 4 credits; 6 laboratory periods.

J-3. COURSE IN FORGING. Continuation of K-2; third year; first semester; 4 credits; 6 laboratory periods.

K-3. COURSE IN FORGING. Continuation of J-3; third year; second semester; 4 credits; 6 laboratory periods.

L. BLACKSMITHING. The student enters upon work having direct application to farming, such as the making and mending of farm implements, chains, clevises, and hooks; the ironing of whiffletrees and neck yokes; the repairing and sharpening of plows and other farm machinery. Short talks and demonstrations are given on the method of building fires so as to obtain the best results in heating, descriptions of fans and forges, the uses of tools for various forgings, and a study of the proper means of heating and treating materials to be used.

Vocational course in Agriculture; first year; second semester; 2 credits; 3 laboratory periods.

M-1. COURSE IN PLUMBING. The purpose of this course is to teach the students those things that will meet the needs of the average plumber. The work consists of instruction and practice

in the care and handling of tools; in working with fittings, traps, valves, faucets, etc.; in working with sewer, soil, waste, water, and gas lines; in cutting and threading water pipe to measurements, using different fittings; in making fine and wiping solder, and in wiping upright joints; in laying out and constructing plumbing for buildings of two or more stories, including apartments and offices; in making range boiler and other hot-water connections; and in the practical uses of the soldering iron. The following subjects secure attention: joint wiping under varying conditions, sewer pipe laying, farm plumbing with the use of septic tanks, water supply systems, plumbing without the use of lead, sheet lead working, and estimating of plumbing construction.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 6 laboratory periods.

N-1. COURSE IN PLUMBING. Continuation of M-1.

First year; second semester; 4 credits; 6 laboratory periods.

M-2. COURSE IN PLUMBING. Continuation of N-1.

Second year; first semester; 4 credits; 6 laboratory periods.

N-2. COURSE IN PLUMBING. Continuation of M-2.

Second year; second semester; 4 credits; 6 laboratory periods.

M-3. COURSE IN PLUMBING. Continuation of N-2.

Third year; first semester; 4 credits; 6 laboratory periods.

N-3. COURSE IN PLUMBING. Continuation of M-3.

Third year; second semester; 4 credits; 6 laboratory periods.

P-1. FOUNDRY. In the foundry course, the importance of foundry practice in the industrial trades is fully recognized. Modern practices and methods, as carried out in the best commercial foundries, are closely followed. The work is varied and is such as to keep students alive with interest and to tax their ability enough to make them think. The course comprises the following: definition and names of tools, characteristics of molding sands, use and care of tools and flasks. The first exercises are intended to familiarize the student with the proper molding condition of the sand and the correct use of the hammer and other tools. A variety of forms add interest to the work. Patterns, in general, are those from which castings are made for use in the Machine shop. Parts of machinery are also constructed in the College shops, such as joints, parting lines, boards and match plates, gates for molds,

common gates, pouring basins, skim gates, horn gates, and shrinkage gates. The student is told when and how to use the various devices which he makes. Among other things, he is given such work as is germane to supporting copes, uses of gaggers, and the use of solders and how to set them; facings such as sea coal, plumbago, talc, charcoal, and the preparation of facing mixtures; molding with good patterns broken castings, skeleton patterns; sweeps, molding of sheaves, pulleys, manhole covers, and rings; brackets; gas engine cylinders; lathe beds, in open sand and pit work, are emphasized. In core making are given materials of core making, core mixtures, uses of core boxes, sweeps and skeleton core arbors, and core rods, provisions for setting large cores by hand and with crane, methods of venting, core baking, and the polishing of cores.

In cupola management the student becomes proficient in preparing the cupola, in charging and pouring off.

The work also includes practice in making castings in brass, bronze, and aluminum, and the making of alloys. Additional lectures are given on malleable castings, loam molding, steel founding, mixing and melting of iron, machine molding, and foundry appliances. The student is taught to keep account of the supplies and labor and be in a position to tell the cost of any article produced in the foundry, also the value of such articles as turned out of commercial shops.

Vocational course; Mechanical Arts; first year; first semester; 4 credits; 6 laboratory periods.

Q-1. FOUNDRY. Continuation of P-1.

First year; second semester; 4 credits; 6 laboratory periods.

P-2. FOUNDRY. Continuation of Q-1.

Second year; first semester; 4 credits; 6 laboratory periods.

Q-2. FOUNDRY. Continuation of P-2.

Second year; second semester; 4 credits; 6 laboratory periods.

P-3. FOUNDRY. Continuation of Q-2.

Third year; first semester; 4 credits; 6 laboratory periods.

Q-3. FOUNDRY. Continuation of P-3.

Third year; second semester; 4 credits; 6 laboratory periods.

T-1. MACHINE SHOP PRACTICE. For students who specialize in machine shop practice, there is work in chipping and filing straight and plane surfaces, filing two pieces to fit, and instruction in laying

off and boring, followed by turning of various kinds of materials at different speeds and estimating of time and cost of work done by using different methods such as with and without gauges, gigs, etc., straight and taper turning, right and left hand thread cutting, single, double, square, and cutting of rack spur bevel and worm gears. There is instruction in the use and classification of gauges, micrometers, and calipers. The advantages of the uses of taps and dies, gigs, and special tools, are taken up; as are also the methods of center squaring, straight and taper turning and fitting, outside and inside screw cutting, chucking and reaming, finishing and polishing, drill tap and mandrel grinding, tap boring, uses of melting machine; tool making, such as taps, reamers, mill cutters, and gauges.

Practical experience is acquired through the construction of machinery, such as lathes, gas engines, steam engines, emery grinders, and through general repair work of the College.

Time cards and stock of material are kept of all work, so that the matter of cost of production is given careful consideration.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 6 laboratory periods.

U-1. MACHINE SHOP PRACTICE. Continuation of T-1.

First year; second semester; 4 credits; 6 laboratory periods.

T-2. MACHINE SHOP PRACTICE. Continuation of U-1.

Second year; first semester; 4 credits; 6 laboratory periods.

U-2. MACHINE SHOP PRACTICE. Continuation of T-2.

Second year; second semester; 4 credits; 6 laboratory periods.

T-3. MACHINE SHOP PRACTICE. Continuation of U-2.

Third year; first semester; 4 credits; 6 laboratory periods.

U-3. MACHINE SHOP PRACTICE. Continuation of T-3.

Third year; second semester; 4 credits; 6 laboratory periods.

V-1. ELECTRICAL CONSTRUCTION AND OPERATION. The purpose of this course is to give the student such theoretical and practical experience as necessary to make him an all round electrical worker.

The theoretical work, consisting of lectures, recitations, and laboratory work, covers the subjects of magnets and magnetism; electromagnetism; application of Ohm's Law, volt, ampere, Ohm, etc.; series and parallel circuits and measurements of resistance; a

study of the underwriters rules; wiring systems; the telephone and telegraph circuits; power, measurements of power; heat loss; mil, circular mil; wire calculations; the applications of the wattmeter; the motor and dynamo, both direct and alternating; wiring, repairing, and construction; tests of motors and generators; care of storage batteries; transformers; single- and multiple-phase circuits; and high tension transmission work. The shop work consists of making the different kinds of joints and splices; soldering; battery connections; telephone wiring, elementary and intercommunicating system; house wiring, exposed surface work, concealed, knob and cleat; flexible tubing, and conduit wiring. Wiring and installing of fixtures; repair of motors and dynamos; ignition, starting, and lighting systems on gas engines and automobiles; line work, armature winding, and commutator construction; transformer and switch board operation. The testing of alternating current generators, transformers, and alternating current machinery, both single- and polyphase, will form a part of this course.

Throughout the course, time cards and lists of material will be kept; and considerable attention will be devoted to the subject of buying of materials and to the financial side of the work.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 6 laboratory periods.

W-1. ELECTRICAL CONSTRUCTION AND OPERATION. Continuation of V-1; first year; second semester; 4 credits; 6 laboratory periods.

V-2. ELECTRICAL CONSTRUCTION AND OPERATION. Continuation of W-1; second year; first semester; 4 credits; 6 laboratory periods.

W-2. ELECTRICAL CONSTRUCTION AND OPERATION. Continuation of V-2; second year; second semester; 4 credits; 6 laboratory periods.

V-3. ELECTRICAL CONSTRUCTION AND OPERATION. Continuation of W-2; third year; first semester; 4 credits; 6 laboratory periods.

W-3. ELECTRICAL CONSTRUCTION AND OPERATION. Continuation of V-3; third year; second semester; 4 credits; 6 laboratory periods.

103. MANUAL TRAINING. Designed to meet the needs of those students who desire to teach manual training in the sixth, seventh, eighth, and ninth grades of the public schools. A course in wood construction and design, including theory and practice in the

proper use of tools; a study of the growth and structure of woods; shrinkage, warpage, and seasoning of timber; staining and finishing. Considerable attention is given to a study of shop methods equipment, courses of study, and proper methods of conducting class work.

Course in Industrial Arts; freshman year; first semester; 3 credits; 4½ laboratory periods.

104. MANUAL TRAINING. Continuation of 103; freshman year; second semester; 3 credits; 4½ laboratory periods.

105. WOODWORK. This course, which is designed for Mining Engineering and Logging Engineering students, consists primarily of a series of constructive exercises in carpentry and joinery, accompanied by one lecture a week dealing with the care and use of bench tools; the use of the steel square in framing and laying out work.

After completing the first constructive exercises which teach the use of the various hand tools, as well as the forms of joints and ties used by good engineering practice in truss and bridge framing, the mining engineering students will take up mine timbering truss and bridge construction relating to the mine; while the logging engineering students will take up the practical use of the steel square.

Mining and Logging Engineering courses; freshman year; first semester; 2 credits; 3 laboratory periods.

106. WOODWORK. The purpose of this course is to give instruction in the care and use of modern woodwork benches and their equipment. Six lectures will be given in this course, each lecture followed by a practical application. Skill in the manipulation of tools cannot be obtained in this short time, but instruction and practice will be given in sharpening chisels, planes, and other edge tools; in jointing, setting, and filing handsaws.

The principal feature of this course will be the instruction and practice in the use of the steel square in brace work and rafter construction.

The course in Agriculture; freshman year; first or second semester; 1 credit; 1½ laboratory periods.

111. WOODWORK. A continuation of course 105 for logging engineering students. This course will take up the construction of camp buildings; for example, bunk houses, cook camps, stables, etc.

Bridge construction of various kinds will be made a strong feature of the course.

In this, as in all other woodwork courses, the filling out of material bills and estimates of cost of material and labor will be required upon receiving or completing the design of the article to be built before the student is supplied with the required material.

Logging Engineering course; freshman year; second semester; 2 credits; 3 laboratory periods.

112. WOODWORK. This course is designed for the architectural students and consists of a series of exercises in planing, sawing, and chiseling, preceded by a lecture, explaining each step in advance.

After a satisfactory working knowledge of the use of the carpenter tools has been accomplished, the practical use of the steel square in brace and detailed roof construction will be taken up.

This work to be developed through the construction of miniature frames of houses, barns, and roofs.

So far as possible, drawings furnished by the architectural department will be used in this work.

Architectural course; freshman year; first semester; 2 credits; 3 laboratory periods.

113. WOODWORK. A continuation of course 112. Correct use of the steel square in laying out practical carpenter work; *e. g.*, windowsills and doorsills, bay and circular windows, steps, stairs, etc. Detailed construction of the window and door frames, sills, caps, weights, and fastenings in relation to the rough framework and the exterior and interior finish of the building.

In like manner, the construction of cornices, gutters, brackets, columns, and newel posts will be taken up.

As soon as the students become familiar with the detailed construction of the above, they will be assigned problems involving original design and construction.

Practice in reading plans, filling out material bills, and estimating the cost of material and labor, will be a strong feature of the course.

So far as possible, drawings furnished by the architectural department will be used in this work.

Elective; freshman year; second semester; 2 credits; 3 laboratory periods.

114. WOODWORK. This course is designed as an elective and may be taken upon the completion of course 106 or its equivalent.

The object of this course is to make a study of labor-saving devices and utensils about the farm, their design, construction, and location; a detailed study of the parts, their construction and improvement.

115. CABINETWORK. This course will be divided into two parts: (a) Mechanical drawing and design, bringing into practice the proper use of drawing instruments in connection with practical, original, and inventive design. (b) The construction of useful articles about the farm or home; *e. g.*, gates, ladders, hayracks, woodracks, movable fences, singletrees, doubletrees, drags, sleds, rollers, farm bridges, chicken houses, and the frame and truss work for machinery sheds, horse barns, dairy barns, and house construction.

Elective; course in Agriculture; sophomore year; first or second semester; 2 credits; 2 laboratory periods.

115. CABINETWORK. This course will be divided into three parts, carried on simultaneously: (a) A lecture course on methods and materials used in cabinetwork; various tools and their proper uses, and finishing materials and their application. Equivalent to one hour per week. (b) One hour per week will be devoted to drawing, original design, and studying of plans, etc. (c) A course giving the correct application of woodwork tools.

Upon acquiring satisfactory skill in the use of bench tools through practical joinery, primary construction work will be taken up. In this work the application of the joints will be shown in the construction of finished products. All of the operations must be methodically and accurately performed and the finished product must have a neat and workmanlike appearance.

The character of the work will be more or less individual and advanced as the student's ability develops.

Elective; freshman year; first semester; 2 credits; 3 laboratory periods.

116. CABINETWORK. Continuation of course 115. This course consists of the designing and construction of furniture according to the ability of the individual student. Mixing of stains, fillers, and various finishes, with their application, will be a strong feature of the course.

The character of the work will be a study of the design and construction of drawers and panel work, and primary upholstery.

Elective; freshman year; second semester; 2 credits; 2 laboratory periods.

131. **PATTERNMAKING.** This course consists of a series of exercises in planing and chiseling to familiarize the student with the proper use of tools; of practical exercises emphasizing the necessity of draught, core prints, core boxes; of exercises showing the necessary allowance for shrinkage of iron and other metals, and its effect on different shapes and thickness of castings. Exercises in wood-turning are given in conjunction with lectures on the lathe, its care and management, and the care and use of turning tools. From the simple exercise the student soon advances to the construction of patterns of parts of machinery and other structures, such as pulleys, pipe fittings, valves, gear wheels, dynamo frames, gas and steam engines, lathes, emery grinders, and other pieces of machinery.

The lectures explain the correct methods of constructing the more complicated work, the principles of molding directly related to patternmaking, shrinkage of metals, kinds of lumber best suited for patternmaking, the working and twisting of woods, glue and metal fastenings, making cores and core boxes, methods of marking and storing patterns, estimating the weight of metal castings.

Courses in Electrical and Mechanical Engineering; freshman year; first or second semester; 2 credits; 3 laboratory periods.

132. **PATTERNMAKING.** This course and the following are a continuation of Patternmaking and are intended for engineering students who desire to devote further time to the subject, or for those who are engaged in the preparation of these, or construction work.

The work will consist largely in making patterns for steam and gas engines and other complicated machines.

Elective; first or second semester; 2 credits; 3 laboratory periods.

134. **PATTERNMAKING.** Continuation of course 132.

Elective; second semester; 2 credits; 3 laboratory periods.

135. **WOOD TURNING AND PATTERNMAKING.** The principles of wood turning are taken up with reference to their application to the useful arts. This leads to patternmaking, which forms the

greater part of the semester's work. One hour per week of the time will be used for shop lectures and recitations upon topics of vital importance to the work, such as selection of material, fastenings and joints, shrinkage of wood, allowance for shrinkage of metal, etc.

The course in Industrial Arts; sophomore year; second semester; 3 credits; 4½ laboratory periods.

136. **PATTERNMAKING.** This is a continuation of course 135, and is intended for those who desire to obtain a more detailed knowledge of the subject. The student will have opportunity to enter more fully into constructive work in patternmaking, by making patterns and core boxes for parts of machines to be built in the College shops.

Elective; junior or senior year; first or second semester; 3 credits; 4½ laboratory periods.

151. **BLACKSMITHING.** The student is taught to make and manage the forge fire; to shape iron by bending, upsetting, drawing, and welding. Many useful articles are made, consisting of hooks, staples, rings, clevises, and chains.

Sophomore year; first semester; 2 credits; 3 laboratory periods.

152. **TOOLMAKING AND TEMPERING.** This course is devoted to the study of the heat treatment of steel as exemplified in making and tempering tools, springs, and other articles of steel.

Prerequisite: Course 151.

The course in Mechanical Engineering; sophomore year; second semester; 1 credit; 1½ laboratory periods.

The course in Logging Engineering, sophomore year; second semester; 1 credit; 1 laboratory period.

The course in Mining Engineering; freshman year; second semester; 1 credit; 1 laboratory period.

153. **BLACKSMITHING.** A course for students in Agriculture. After completing the first exercise, the student enters upon work having direct application to farming, such as the mending of farm implements, making and mending of chains, clevises, and hooks; ironing of whiffletrees and neck yokes; sharpening of tools.

Elective; sophomore year; first semester; 1 credit; 1½ laboratory periods.

154. **BLACKSMITHING.** A continuation of course 152, for students wishing to take an entire year of blacksmithing.

Elective; sophomore year; second semester; 2 credits; 3 laboratory periods.

155. **FORGING.** This course deals with the equipment of the blacksmith shop, and includes exercises in bending, shaping, upsetting, and welding iron. Some instruction is given also in hardening and tempering steel, and in brazing. The course is accompanied with lectures on the management of the fire, methods of construction, and shop equipment.

The course in Industrial Arts; junior year; first semester; 2 credits; 3 laboratory periods.

156. **HAMMERED METAL WORK.** This course consists of hand wrought metal and enamel work, including hard and soft soldering, the formation of bowls, trays, boxes, lamp shades. The design and construction of furniture fittings.

The course in Industrial Arts; junior year; second semester; 2 credits; 3 laboratory periods.

171. **FOUNDRY PRACTICE.** This course includes a study of the foundry equipment; care and management of cupolas; mixing and melting of iron; moulding in green and dry sand; preparation of cores; casting in iron and brass.

The course in Mechanical Engineering; freshman year; first semester; 2 credits; 3 laboratory periods.

173. **FOUNDRY PRACTICE.** A course in all respects equivalent to course 171.

The course in Electrical Engineering; freshman year; first or second semester; 2 credits; 3 laboratory periods.

175. **ADVANCED FOUNDRY PRACTICE.** Continuation of 171 and 173. Elective; 2 credits; 3 laboratory periods.

202. **MACHINE SHOP.** The work in the machine shop includes both bench and machine work. Upon first entering the shop the student is taught the principles of chipping, filing, and hand finishing. This occupies the first half of the semester. Machine work is then taken up through a series of exercises on lathe, shaper, planer, drill press, and milling machine. As soon as accuracy and proficiency are shown on the part of the student, he is assigned to construction work upon engines, dynamos, motors, or machine

tools. One hour of the student's time will be required each week in the class room to attend lectures, work problems, or prepare other work assigned by the instructor.

The course in Mechanical Engineering; sophomore year; second semester; 1 credit; 1½ laboratory periods.

203. MACHINE SHOP. A continuation of course 202 devoted to machine construction and milling machine work. Special attention is paid to economical shop methods of doing work.

The course in Mechanical Engineering; junior year; first semester; 2 credits; 3 laboratory periods.

204. MACHINE SHOP. This and the following courses are a continuation of 203.

Mechanical Engineering course; second semester; 2 credits; 3 laboratory periods.

206. MACHINE SHOP. A course similar to course 202, designed to meet the requirements of students in Electrical Engineering.

The course in Electrical Engineering; sophomore year; second semester; 2 credits; 3 laboratory periods.

207. MACHINE SHOP. Continuation of 206.

Elective; Electrical Engineering students; junior year; first semester; 2 credits; 3 laboratory periods.

208. MACHINE SHOP. This course begins with the hand processes of chiseling, filing, and polishing, which are followed by a detailed study of the lathe, drill press, planer, and shaper, taught by means of carefully planned exercises. The course includes one hour per week of lecture or recitation work to supplement the instruction given in the shop.

The course in Industrial Arts; senior year; first semester; 2 credits; 3 laboratory periods.

209. MACHINE SHOP. A continuation of course 208 in which the student becomes familiar with the more complicated machines such as turret lathes, and milling machines. Shop methods are studied with reference to economical production. The student, as far as possible, enters upon construction of machinery and apparatus for College equipment.

The course in Industrial Arts; senior year; second semester; 2 credits; 3 laboratory periods.

230. **DAIRY MECHANICS.** This course is arranged for the students of Dairy Manufactures. An attempt is made to give in a brief way through lectures and laboratory work, a knowledge of the elements of machine mechanics, plumbing, operation of motors, dynamos, gas and steam engines, electric wiring, setting of line shafting, and the operation and repair of machinery. This work is given by instructors in the plumbing and machine shops, and in the electrical materials and mechanical engineering laboratories.

Dairy Manufactures; senior or junior year; second semester; 2 credits; 2 laboratory periods.

231. **MANUAL TRAINING FOR ELEMENTARY GRADES.** This course deals with the design and construction of cardboard work, weaving, basket, and mat work, stencil cutting, bookbinding, and other industrial subjects such as are taught in the first six grammar grades.

Prerequisite or parallel: Course 171 Industrial Pedagogy.

Course in Industrial Arts; senior year; first semester; 2 credits; 3 laboratory periods.

232. **MANUAL TRAINING FOR ELEMENTARY GRADES.** Continuation of 231.

Second semester; 2 credits; 3 laboratory periods.

301. **SHOP DRAWING.** This course is intended for those students who are specializing in Industrial Arts. In the beginning the work is devoted to the learning of the elements of drawing, the general use of the drawing instruments, lettering general constructions, methods of representation and free-hand sketching. Considerable attention will be given to drawings of pieces of furniture and constructions in wood that may be worked out in the shops.

Industrial Arts course; first semester; 2 credits; 3 laboratory periods.

302. **SHOP DRAWING.** Continuation of 301.

Second semester; 2 credits; 3 laboratory periods.

SCHOOL OF MINES

PROFESSOR PARKS

PROFESSOR WILLIAMS

ASSOCIATE PROFESSOR BUTLER

MR. SWARTLEY

MR. FRENCH

MR. GOODSPEED

The School of Mines occupies a new, commodious, three-story and basement building especially designed for housing the lecture rooms and laboratories devoted to mining, metallurgy, ore dressing, geology, ceramics, chemical engineering, and closely allied subjects.

Four-year courses leading to the degrees of Bachelor of Science in Mining Engineering, Ceramics, and Chemical Engineering are offered; and the advanced degrees of Mining, Ceramic, and Chemical Engineer are conferred, upon the completion of the requisite amount of graduate work, as prescribed elsewhere in this catalogue.

Instruction is given by means of lectures and textbooks, supplemented by recitations, and by a great deal of work in the laboratories and field. While the more theoretical studies are not neglected, a determined effort is made to emphasize the practical application and value of all the subjects taught. For this reason, nearly fifty per cent of a student's time is spent in laboratory courses.

The first two years in all three departments are identical, and are intended to give the student a thorough comprehension of those studies basic to all branches of engineering; namely, Mathematics, Physics, Chemistry, Mechanical Drawing, Plane Surveying, and Shop Work. To these fundamental subjects are added courses in Dynamical and Structural Geology, Crystallography and Blowpipe Analysis, and Determinative Mineralogy.

In the last two years, the student takes up the technical studies distinctive of the course pursued. This leads to considerable variation in the work of the different departments, as is indicated in the outline of courses. Statics and Dynamics, Strength of Materials, Hydraulics, and Electrical Machinery are required, however, in all of them.

At least two months employment in industrial lines closely allied to the course pursued, is a prerequisite to entrance upon the senior year.

The work in the School of Mines is so broad in nature that it should equip a student for general engineering operations of many kinds, but particular emphasis is placed, naturally, upon preparation for those fields of activity that are concerned with the discovery, mining or quarrying, and preparation for market, of the mineral wealth with which the Northwest is so richly endowed.

GEOLOGY

The following courses are offered:

111. CRYSTALLOGRAPHY AND BLOWPIPE ANALYSIS. This course is intended to prepare a student for the work in Determinative Mineralogy; and only those portions of the included subjects are emphasized, which are essential for the proper understanding and determination of minerals. A very thorough drill is given in these. Instruction is imparted by lectures, textbook, and laboratory work, and individual oral quizzes. In the laboratory work in Crystallography, a student is required to become thoroughly familiar with the crystal systems and forms by studying a large number of wooden crystal models; later, he determines the forms on several hundred natural crystals by means of a pocket lens and contact goniometer. Blowpipe Analysis is a rapid and useful method of ascertaining all, or a part, of the elements present in minerals. The course offered in this subject includes practice in the use of the blowpipe and the operations ordinarily included under the term Blowpipe Analysis, experimental work upon known substances until facility in the recognition of the various tests is attained, and the analysis of a score or more of unknown substances.

Prerequisites: Chem. 100 and 101.

Sophomore year; first semester; 3 credits; 2 recitations; 3 laboratory periods.

112. DETERMINATIVE MINERALOGY. In this course, about one hundred and sixty important mineral species, and scores of varieties of these, are studied. Emphasis is placed throughout the course upon methods of classification of minerals involving a knowledge of the physical characteristics as shown by a visual examination and by the use of a pocketknife. Chemical and blowpipe methods are

employed only to corroborate the inferences drawn from such observations. The end sought is the instantaneous recognition, in the field, of those minerals likely to be encountered in mining operations, rather than the classification of any mineral after a long series of tests in the laboratory. The methods of instruction used in the course include lectures, textbook, and laboratory work, and individual oral quizzes. Each student is expected to determine approximately two thousand individual specimens.

Prerequisite: Geol. 111.

Sophomore year; second semester; 3 credits; 2 recitations; 3 laboratory periods.

131. **PETROLOGY.** The object of this course is to familiarize a student with the characteristics of the commoner rocks in such a way as to make it possible to identify them with reasonable accuracy in the field. The methods employed are solely those applicable to hand specimens without the use of microscopic thin sections. The same methods of instruction are used as in Determinative Mineralogy, a portion of the scheduled laboratory periods being used for lecture purposes. Each student is expected to determine approximately seven hundred and fifty individual specimens.

Prerequisite: Geol. 112.

Junior year; second semester; 2 credits; 3 laboratory periods.

132. **PETROGRAPHY.** This course deals with the optical properties of rock-forming minerals and the classification of rocks by the use of thin sections and the petrographic microscope. It is an elective course and is limited to such graduate or advanced students as are especially qualified to take it.

Prerequisite: Geol. 131.

140. **GENERAL GEOLOGY.** An elementary course dealing with the composition, structure, and history of the earth, and the forces or agents that have been, and still are, instrumental in producing or changing its surface configuration and internal arrangement. Several excursions may be made to places of geological interest for the purpose of illustrating points discussed in the class room.

Optional in any course; either the first or the second semester; 3 credits; 4 recitations; 1 laboratory period.

153. **DYNAMICAL AND STRUCTURAL GEOLOGY.** A lecture course on geological courses and agents and their effects. Those structural

features likely to be encountered in mining operations are emphasized and the laws governing them are given. The lectures are supplemented by numerous problems of a very practical nature, and by several field trips to neighboring points of geological interest.

Freshman year; first semester; 2 credits; 4 recitations.

155. HISTORICAL GEOLOGY. A course of lectures on the origin and history of the earth and the plants and animals that have lived thereon. An outline of invertebrate paleontology is presented, and the student is taught how to determine the age of fossiliferous rocks by means of "faunal groups" rather than by the recognition of characteristic species. A part of the scheduled recitation periods are utilized for laboratory work.

Prerequisite: Geol. 153.

Junior year; first semester; 1½ credits; 4 recitations.

161. FOREST GEOLOGY. In this course, a student is taught how to recognize the commoner ore and gangue minerals and rocks at sight. This is followed by the study of the more important structural features occurring in earth materials and the criteria of the various types of ore deposits.

Prerequisites: Chem. 100 and 101.

Required in the Forestry course; optional in all others; sophomore year; first semester; 3 credits; 2 recitations; 1 laboratory period.

171. AGRICULTURAL GEOLOGY. This course deals with the origin and nature of soils from a geological standpoint, entirely. A study is first made of the commoner rocks, which a student is taught to classify at sight. This is followed by work on rock weathering and decay.

Prerequisites: Chem. 100 and 101.

Elective in the Agricultural course; junior or senior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

181. MINING GEOLOGY (Principles of Economic Geology). A lecture course dealing with the theories of ore deposition, types of ore deposits, and the criteria governing the recognition of each; data bearing on the possible impoverishment or change in the character of ore at depth; ore shoots; following ore deposits or searching for ore shoots underground; irregularities produced by faulting, folding, and intrusion; and the recovery of lost ore bodies. The

work is made as practical and definite as the nature of the subjects treated will permit, and many problems and illustrations derived from actual mining operations are presented and discussed.

Prerequisites: Geol. 153 or 161 or 171.

Senior year; first semester; 3 credits; 5 recitations.

182. **ECONOMIC GEOLOGY.** This course deals with the origin, manner of occurrence, geological relations, and the geographical distribution of, and the factors governing the market for, all economically important metallic and non-metallic minerals and rocks. Many important mining areas are studied in detail and attempts are frequently made to apply the principles presented in Mining Geology.

Prerequisite: Geol. 181.

Senior year; second semester; 3 credits; 5 recitations.

190. **FIELD WORK IN GEOLOGY AND MINING.** This is a six weeks' field course carried on during the summer in an area showing diversified geology and where mining operations are being actively conducted. A topographic map covering fifteen to twenty-five square miles is drawn by triangulation, traverse, statia, and plane table methods; the various geological features are then mapped and interpreted, and geological sections drawn; all mines and prospects are carefully examined and mapped; and the economic resources are then examined in detail.

Prerequisites: The completed work of the junior year.

After the junior year, during the summer vacation. May be substituted for Practical Geology or Mining.

199. **PRACTICAL GEOLOGY.** All students in the School of Mines are required to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course which the student is pursuing. This must be done before a student enters upon the senior year of his college work, and evidence of the nature, quality, and sufficiency of the same will be passed upon by the proper department before credit for the work is given. While the minimum requirement is two months, it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. This is very im-

portant, as it not only increases a student's insight into the technical subjects later studied, but also teaches him to appreciate the value of such advanced work.

212. **MINE SURVEYING AND MINING LAW.** This course supplements that in Plane Surveying, taken in the freshman year. The methods used in underground surveying and mine mapping, in locating and patenting mineral claims, and in such geodetic and topographic surveying as a mining engineer is often called upon to do, are studied; facility in the practical application of these methods is imparted by actual work in the field. Considerable attention is given to the solution of the many problems involving surveying which arise in mining operations; and some time is devoted to the study of the laws regulating the location, possession, and operation of mineral deposits in the United States.

Prerequisite: C. E. 201.

Junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

221. **MINING METHODS.** This is a study of the various methods used in securing the mineral products. The subject includes methods of timbering, methods of mining, pumping, ventilation, transportation, hoisting, mine sampling and reporting, installation of machinery, and surface improvements. The subject is presented largely through lectures and directed reference work.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering.

Senior year; second semester; 3 credits; 4 recitations.

222. **MINE ECONOMICS.** This course takes up in detail the cost of extracting from mines, under varying conditions, gold, silver, copper, iron, and other metal ores, as well as coal.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering.

Senior year; second semester; 3 credits; 4 recitations.

223. **MINE EXAMINATION AND REPORTS.** This course covers the valuation of mines, of surface and underground equipment, and of development work; the sampling of ore bodies; the calculation of the amount of gross value of ore reserves; the valuation of ore bodies; sampling of placer deposits; sampling of coal seams; valuation of coal seams; sampling and valuation of other mineral bodies; percentage of ore recoverable; probable cost of converting

reserves into a source of revenue; economic factors in mine valuation; mine reports; and the practices of prominent mining engineers throughout the world.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering.

Senior year; second semester; 1 credit; 2 recitations.

231. POWER EQUIPMENT. A discussion of the sources of power, water, hydro-electric, steam, gas, and compressed air, together with their practical application to mining operations.

Senior year; second semester; 3 credits; 4 recitations.

241. DESIGN OF MINE AND MILL STRUCTURES. This course covers the design of steel and wood mill and mine buildings, head-frames, ore bins, and aerial tramways. In connection therewith, the covering, lighting, and ventilating of such structures is considered.

Prerequisites: M. E. 200, 201.

Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

251. ORE DRESSING. A study of the principles and the various methods of ore concentration and the mechanical preparation of ores for metallurgical treatment. This includes crushing machinery, screens, stamp mills, classifiers, jigs, vanners, and tables. Processes such as amalgamation, magnetic separation, flotation, electrostatic concentration, etc., are also discussed.

Prerequisite: Geol. 112.

Junior year; first semester; 3 credits; 3 recitations; 1 laboratory period.

299. PRACTICAL WORK IN MINING. For a description of this course see Geol. 199, with which it is identical.

CERAMICS

The course of instruction in Ceramics is designed to prepare young men to make intelligent search for suitable raw materials, to test them properly, and to aid in their economic exploitation and development. At the outset, therefore, ceramic students are required to take substantial courses in the basic sciences, chemistry, mathematics, physics, geology, and the preliminary engineering subjects required of other students in the School of Mines.

Work in the subjects distinctive of the course is confined to the last two years, and includes lectures and laboratory instruction and practice in the processes and methods of manufacture of ceramic wares, including, besides the commoner clay products, pottery and porcelain, and the compounding and application of glazes, enamels, etc. Both the materials used and the finished articles will be studied and tested. The physical and chemical principles on which the production and value of ceramic products are based are thoroughly presented, and the student is shown that successful manufacture depends upon a thorough knowledge and constant application of these principles.

The following courses are offered:

301. CERAMIC CHEMISTRY. Analysis of clays, glasses, glazes, and silicate minerals. Chemical study of fire gases.

Prerequisites: Chemistry 301, 401.

Junior year; first semester; 3 credits; 3 laboratory periods.

303. CERAMIC RAW MATERIALS. The occurrence, properties, identification, and winning of clays and other ceramic materials.

Prerequisite: Completed work of the freshman and sophomore years.

Junior year; first semester; 3 credits; 3 recitations; 3 laboratory periods.

310. RAW MATERIALS TESTING. Continuation of the laboratory work of Ceramics 303. Lectures at intervals as required.

Prerequisites: Ceramics 303 and Chem. Eng. 471.

Junior year; second semester; 2 credits; 2 laboratory periods.

312. CERAMIC CALCULATIONS. Calculations involved in the blending of raw materials for pottery bodies, glazes, etc. Practical ceramic problems.

Prerequisites: Ceramics 303; Chem. Eng. 471.

Junior year; second semester; 1 credit; 1 recitation.

321. MANUFACTURE OF CLAY PRODUCTS. Principles of the manufacture of clay wares, and the machinery used in drying and burning.

Prerequisite: Completion of the first three years of the Ceramics course.

Senior year; first semester; 4 credits; 3 recitations, 2 laboratory periods.

322. CLAY PRODUCTS LABORATORY. Continuation of the laboratory work of Ceramics 321. Lectures at intervals as required.

Prerequisite: Ceramics 321.

Senior year; second semester; 3 credits; 3 laboratory periods.

323. GLASSES, GLAZES, AND ENAMELS. Classification, production, properties, and defects. Methods of application to ceramic wares.

Prerequisites: Ceramics 303 and 312; Chem. Eng. 471.

Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods.

324. CERAMIC LABORATORY. Continuation of the laboratory work of Ceramics 323. Lectures at intervals as required.

Prerequisite: Ceramics 323.

Senior year; second semester; 2 credits; 2 laboratory periods.

326. LIMES AND CEMENTS. Lime, cement, plaster, and other cementing materials; and sand-lime products. Production, properties, and uses.

Prerequisites: Chem. 301 and 401.

Senior year; second semester; 3 credits; 3 recitations.

328. FIELD WORK AND REPORT. Visits to cement, clay, and other related industrial plants; carefully written reports.

Prerequisites: Ceramics 322 and 326.

Senior year; second semester; 1 credit; 1 laboratory period.

330. THESIS. A careful study of some special ceramic problem.

Prerequisite: Completion of all ceramic courses offered before the second semester of the senior year.

Senior year; second semester; 2 credits; 2 laboratory periods.

399. PRACTICAL WORK IN CERAMICS. For a description of this course, see Geol. 199.

With the consent of the heads of the departments interested, students may be admitted to the ceramic courses from the other departments in the School of Mines, from the School of Engineering, and the department of Art and Architecture.

CHEMICAL ENGINEERING

This course is intended to provide the instruction and training required by young men who desire to engage in the manufacture of those substances involving chemical processes and manipulations in their production.

Industries of this nature are so numerous and various that it is impossible to familiarize a student with all of them. The course is accordingly so presented as to give in the first half of the course a thorough knowledge of all the fundamental engineering subjects and chemical processes, while the latter half of the course is largely elective. This enables a student to specialize along chosen branches of chemical activity.

Throughout the work in this department, special attention is given to those industries that already exist in Oregon, or that must be put into operation if the resources of the State are to be properly developed.

The following courses are offered:

401. FIRE ASSAYING. The work of this course includes the crushing and sampling of ores and their assay for gold, silver, and lead; also the assay of various metallurgical products such as bullion, matte, etc. Special attention is given to the principles of the subject, which is treated from a scientific and rational point of view, rather than by "rule of thumb." Each student is required to make a large number of assays upon previously sampled and assayed pulps, and to learn to check these within very close limits.

Prerequisites: Chem. 301, 401; Geol. 112.

Junior year of Mining Engineering course; first semester; 3 credits; 1 recitation; 2 half days in the laboratory.

411. GENERAL METALLURGY. A study of metallurgical principles and processes and of such industrial materials as fuels, refractories, slags, etc., from a quantitative physical and chemical standpoint. Different kinds of pyrometers and calorimeters are studied; various fuels are compared; furnace materials and designs are taken up in detail; and enough problems are given to enable a student to solve all ordinary metallurgical computations.

Prerequisites: Chem. 301 and 401; Physics 101 and 102.

Junior year of the Mining Engineering and Ceramics courses; first semester; 2½ credits; 5 recitations.

412. **METALLURGY OF LEAD AND COPPER.** This course comprises a detailed study of the furnaces, appliances, operations, and materials used in the extraction of these metals from their ores, and in refining them. Particular attention is given to the important principles underlying these processes.

Prerequisite: Chem. Eng. 411.

Senior year of Mining Engineering course; first semester, 3 credits; 5 recitations.

421. **CYANIDATION OF ORES.** This is a detailed study of the cyanide process of extracting gold and silver from ores. The chemical principles involved in solution and precipitation are first mastered; then the operations and many mechanical devices in use are studied. Catalogues of leading manufacturers are freely used to illustrate the latest appliances.

Prerequisites: Chem. — ; Chem. Eng. 401.

Senior year of Mining Engineering course; first semester; 3 credits; 5 recitations.

423. **METALLURGICAL LABORATORY.** Each student in this course determines by laboratory tests the fitness of a given ore for cyanide treatment; ascertains the percentage of extraction by various methods; and finally, studies costs and selects the process that should give the greatest net returns.

Prerequisite: Must be taken in conjunction with, or after the completion of Chem. Eng. 421.

Senior year of Mining Engineering course; first semester; 2 credits; 2 laboratory periods.

431. **CHEMICAL AND METALLURGICAL PROCESSES.** A course of lectures supplemented by laboratory study of the general operations common to many industries, such as crushing, grinding, lixivation, filtration, evaporation, distillation, crystallization, etc., as well as the details of the various types of apparatus used for carrying on these processes.

Prerequisites: Chem. 301, 401.

Junior year; first semester; 3 credits; 4 recitations; 1 laboratory period.

442. **ELECTRO-METALLURGY.** This is a laboratory and lecture course in which are studied the principles and processes involved

in those industries which require the use of the electric current in producing and refining metals.

Prerequisite: Chem. 406.

Senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

452. THERMO-CHEMISTRY. A continuation of Physical Chemistry in which the influence of temperature upon chemical reaction is studied more specifically than in the earlier course.

Prerequisite: Chem. 410.

Junior year; second semester; 4 recitations; 1 laboratory period.

461. CHEMICAL TECHNOLOGY. A lecture and laboratory course in which the more important chemical industries are studied in detail. Various problems connected with such industries are worked out by the student in the laboratory.

Prerequisite: Chem. Eng. 431.

Senior year; first semester; 4 credits; 4 recitations; 2 laboratory periods.

462. CHEMICAL TECHNOLOGY. A continuation of Chem. Eng. 461.

Prerequisite: Chem. Eng. 461.

Senior year; second semester; 4 credits; 4 recitations; 2 laboratory periods.

499. PRACTICAL WORK IN CHEMICAL ENGINEERING. For a description of this course, see Geol. 199.

SCHOOL OF COMMERCE

PROFESSOR BEXELL

PROFESSOR MACPHERSON

PROFESSOR HORNER

PROFESSOR DUBACH

ASSISTANT PROFESSOR BROWN

ASSISTANT PROFESSOR BLANCHARD

MR. LEMON

MR. MAXEY

MR. BALDWIN

MR. HOWARD

The following courses are offered:

B. BOOKKEEPING. The aim of this course is to give the student a thorough foundation in the fundamental principles of bookkeeping. A comparison of single and double entry; the theory of debit and credit; changing from single to double entry bookkeeping; promissory notes, interest and discount; statements; closing a set of books; the journal, cashbook, sales book, purchase book, and bill book; drafts, bills of lading, and other legal forms receive much attention. Every phase of the work is illustrated by means of a large number of practical problems secured from various sources.

Two-year business course; first semester; 3 credits; 1 recitation; 4 laboratory periods.

C. BOOKKEEPING. Continuation of Course B. The subjects of partnership, shipments, and consignments are here introduced. Elementary problems of how to handle depreciation, reserves, and accruals; the preparation, analyzing, and checking of balance sheets and financial statements; the distinction between capital and revenue; the use of controlling accounts and columnar books are carefully treated. Throughout the entire course the work is supplemented by a large number of practical problems illustrating the various subjects treated.

Two-year business course; second semester; 3 credits; 1 recitation; 4 laboratory periods.

D. DAIRY ACCOUNTING. The same general course as E, except that in the last third of the course special attention will be given to the development of a system of accounts suited to the dairy business.

Dairy Vocational course; second semester; 3 credits; 2 recitations; 2 laboratory periods.

E. FARM ACCOUNTING AND BUSINESS METHODS. (a) *Book-keeping*: Students who are not acquainted with the elements of double entry bookkeeping will be required to work out several practice sets and master the theory of accounts before taking up farm accounting. (b) *Business Methods*: A thorough course in the essentials of business methods required on a well-managed farm. Financial accounts and statements, cost accounts and special records, business methods, business organization, business correspondence and forms; household and personal accounts.

The course in Agriculture; second semester; 3 credits; 2 recitations; 2 laboratory periods. This course may also be taken by correspondence.

F. SHOP ACCOUNTING. A course in the theory and practice of accounting especially adapted to the shop and factory. Sufficient time is devoted to the fundamental principles of bookkeeping to familiarize the student with the use of special columns and various labor-saving devices. A special set of books adapted to the shop is then studied and prepared, making the course exceptionally practical. Besides the course in the technique of bookkeeping, considerable time is devoted to the phases of business management, such as advertising, selling, and buying.

The course in Mechanic Arts; second semester; 2 credits; 1 recitation; 1 laboratory period.

U. PENMANSHIP. Students entering the first year are expected to have acquired a good hand in the grades, but considerable time is devoted during the first year to mastering the best form of business writing and lettering.

Two-year business course; first year; first semester; 2 credits; 2 library periods.

V. PENMANSHIP. A continuation of Course U.
Second semester; 2 credits; 2 laboratory periods.

W. ADVANCED PENMANSHIP. Special emphasis is laid on rapid business writing, correct forms of business papers, lettering, and designing.

Two-year business course; second year; first semester; 1 credit; 1 laboratory period.

X. ADVANCED PENMANSHIP. A continuation of Course W. Second semester; 1 credit; 1 practice period. Required of all commercial students; elective to others.

100. PRINCIPLES OF BUSINESS ACCOUNTING. Modern accounting as practiced in the best business establishments of the country, forms the basis of the work. The use of special columns, controlling accounts and their adaptations are carefully studied. The student becomes familiar with a great variety of labor-saving forms used in the modern business office. Labor-saving devices of all kinds are studied with a constant view to secure greater accuracy and to diminish work. A great deal of practice in retailing, wholesaling, and the preparation of financial statements is required. The practical work consists of various sets of practice books which the student prepares under the supervision of the instructor.

Prerequisite: Course C or equivalent.

Freshman year; first semester; 3 credits; 1 recitation; 4 laboratory periods.

101. PRACTICAL ACCOUNTING. (a) *Partnership Accounts*: A study of opening and closing entries; adjustment of profits and losses; consolidation of firms; changing from partnership to single proprietorship and *vice versa*, and the preparation of a set of books of a partnership business. (b) *Corporation Accounts*: A presentation of the theory of manufacturing bookkeeping. A set of books will be prepared illustrating corporation bookkeeping as applied to manufacturing business. (c) *Short-Accounting Systems*: A further study of the use of special column books and filing devices, with reference to the saving of time and labor in bookkeeping, as applied to modern business houses. The preparation of a set of books illustrating the principles involved is also required in this course.

Freshman year; second semester; 4 credits; 2 recitations; 4 laboratory periods.

102. ACCOUNTING AND BUSINESS PRACTICE. (a) *Bank Accounting*: A thorough course in modern bank accounting and business

practice. The organization of private, state, and national banks, trust companies, and other financial institutions. (b) *Business Practice*: The business practice course is designed to supplement all the theoretical courses and to develop initiative and originality. The offices are thoroughly equipped with modern labor-saving appliances, such as filing devices, loose-leaf books, adding machines, duplicating devices, etc.

Prerequisite: Course 101.

Sophomore year; first semester; 4 credits; 2 recitations; 3 laboratory periods.

103. ACCOUNTING AND BUSINESS PRACTICE. This course covers the broader economic phases of accounting. Emphasis is laid on accounts as a means of administrative control and economy of production.

(a) *Factory Costs*. A system of accounts and records especially adapted to a manufacturing business with a considerable pay-roll.

(b) *Farm Cost Accounts*. A system of cost accounts adapted to the farm or any productive enterprise.

(c) *Business Practice*. A continuation of Course 102.

Sophomore year; second semester; 4 credits; 2 recitations; 3 laboratory periods.

105. ACCOUNTING PROBLEMS. In the efficient administration of a business of some magnitude, the accounting department is of first importance. In it, difficult problems arise, which require not only accounting skill, but judgment and executive ability. This course covers a large variety of practical problems viewed from the standpoint of the manager rather than the accountant. The material is drawn from certified public accountancy examinations and other sources. The student does not follow any prescribed form of treatment or solution, but is expected to develop analytical initiative, resourcefulness, and originality.

Prerequisite: Course 104.

Elective; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

106. PUBLIC ACCOUNTING AND AUDITING. (a) *Public Accounting*: This course embraces a study of accountancy as a profession; the C. P. A. laws of the various states are studied and compared;

an analysis and interpretation of accounts and financial statements; terminology and procedure in public systems form an important part of this course.

(b) *Auditing*: The duties and responsibility of the auditor; his function in the executive staff; his relation to the accounting department; different classes of audits; investigation in the conduct of utility corporations, municipalities, and public institutions. Typical audits will be studied and compared.

Prerequisite: Course 105.

Elective to students in commerce; 3 credits; 2 recitations; 2 laboratory periods.

107. GENERAL ACCOUNTING. An abridgement of Course 100. Open to all students except those who take course 100.

Either semester; 2 credits; 1 recitation; 1 laboratory period.

108. SPECIAL ACCOUNTING. In this course the student is given an opportunity to apply the principles of accounting to his special needs, the course being designed primarily for engineering students. Cost accounting, and corporation accounts and statements receive special attention.

Prerequisite: Course 107 or equivalent. Course in Electrical Engineering (elective to others); freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

109. FARM ACCOUNTING AND BUSINESS METHODS. (a) *Farm Accounting*: This part of the course consists of a thorough discussion of a system of accounts suited to the farm. Cost accounting is especially emphasized, with a view to determining the results of different enterprises. A knowledge of the principles of bookkeeping is required before entering upon cost accounting. Students who are not thus prepared will be required to devote extra time to make up the deficiency.

(b) *Business Methods*: The economics of business receive special attention in this part of the course. The farmer is becoming a factor in commerce and finance to be reckoned with. He often engages in business adventures outside of farming; if he aspires to success he must observe the same rules of business as a manufacturer, merchant, or banker. Business organization, principles of business management; labor efficiency; buying and selling; advertising and correct office methods receive special attention.

The course in Agriculture; sophomore year; first semester; 2 credits; 1 recitation; 1 laboratory period.

110. BUSINESS ORGANIZATION AND MANAGEMENT. (a) *Business Organization*: General nature of business organization; evolution and forms; structure and life history of typical corporations; the corporation and trust problem; public utility corporations; reorganization and receivership; blue sky laws and state control.

(b) *Parliamentary Practice*: A brief discussion of parliamentary practice and procedure as applied to corporate business.

(c) *Business Management*: This part of the course emphasizes internal organization for the purpose of securing efficiency; departmental organization and coordination; various systems of scientific management are studied and compared.

Junior year; first semester; 3 credits; 3 recitations.

111. THESIS. A research course and treatise on the organization and management of a business in which the student is especially interested. The subject of the thesis must be chosen at the time of registration, and a complete outline approved by the professor in charge not later than November 1. When the thesis is approved, a bound (either printed or typewritten) copy must be deposited in the College library.

Prerequisite: All College courses in Business Administration. Open only to seniors.

Both semesters; 1 credit each semester.

112. ADVERTISING AND SELLING. (a) *Advertising*: A study of the fundamental principles of modern advertising. Special emphasis is given to the peculiarities of composition in newspaper and circular advertising, proofreading, effectiveness of design, illustration and display, follow-up systems, etc.

(b) *General Principles of Salesmanship*: Business ethics; wholesaling and retailing; brokerage and commission; specialty selling; the sale of service; planning a selling campaign; special sales; prices; correct buying.

Junior year; second semester; 3 credits; 3 recitations.

122. HOME AND PRIVATE BUSINESS MANAGEMENT. (a) *Accounts and Business Methods*: The principles of accounts are rapidly reviewed with a view to laying a foundation for systems of private or household accounts and budgets; business correspondence and forms.

(b) *Fundamentals of Business Law*: The principles of the law of contracts, of negotiable paper, of master and servant, of real property, of wills or bequests, and of court procedure.

(c) *Finance*: Banking and credit, investments, mortgage loans, life insurance, and loan associations.

Home Economics course; freshman year; second semester; 2 credits; 1 recitation; 1 laboratory period.

124. PHARMACY ACCOUNTING. A course in the theory and practice of accounting, especially adapted to the drug business. Sufficient time is devoted to the fundamental principles of bookkeeping to familiarize the student with the use of special columns and various labor-saving devices. A special set of books adapted to the average drug establishment is then prepared, making the course exceptionally practical. Besides the course in the technique of bookkeeping, considerable time is devoted to other phases of business management, such as advertising, selling, and buying.

Course in Pharmacy; second semester; 2 credits; 1 recitation; 1 laboratory period.

130. COOPERATIVE ACCOUNTING AND MANAGEMENT. This course covers the business management of cooperative societies. It includes such subjects as the organization of the employees; structure of buildings; office arrangement and equipment; correspondence and filing; bookkeeping and cost accounting especially adapted to different types of cooperative associations in the United States, such as creamery associations, cow-testing associations; auditing, banking, and finance; purchasing, advertising, selling; depreciation of assets; conduct of membership meetings; annual reports and audits; statistical analysis of operations. The course is based on the system published by the Cooperative Union Limited of England, adapted to American conditions.

Course in Farm Management; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

ECONOMICS

I. BUSINESS AND SOCIAL ORGANIZATION. This course embodies a discussion of the principles of better business and better living that should accompany the general improvement in farm methods, which it is the purpose of this school to promote. The general application of the economic laws of consumption, distribution, and

production to the business side of farming, and the social and economic results of agricultural organization will be studied by the aid of textbook, lectures, and assigned readings.

Vocational course in Agriculture; first semester; 3 credits; 3 recitations.

J. ELEMENTARY INDUSTRIAL PROBLEMS. This is a course especially designed for vocational students in industrial arts. It aims to give them some insight into the economic problems with which they will have to deal. A very condensed outline of the principal economic concepts will be followed by the discussion of industrial organization, labor problems, transportation, marketing, taxation, etc.

Vocational course in Mechanic Arts; third year; second semester; 3 credits; 3 recitations.

K. ELEMENTARY INDUSTRIAL HISTORY. The history of industrial methods and the progress of invention is taken up from earliest times down through the English industrial revolution. Then follows a more detailed treatment of the industrial and commercial history of the United States. The evolution of industrial organization through the domestic to the factory system, the influence of these industrial changes upon the relations between capital and labor, the rise of a labor class, the opposing organizations consolidating labor and capital, problems incident to the formation of large corporations, the abuses of the trust, anti-trust legislation, etc., will be taken up with the aid of a textbook in industrial history, supplemented by lectures and the study of present day problems as outlined in the press.

Vocational course in Mechanic Arts; second year; 2 credits each semester; 2 recitations.

200. COMMERCIAL GEOGRAPHY. In this course the fundamental conditions underlying all industry and all commerce are taken up in detail. First of all such basic elements as climate and topography are investigated as they mold transportation and commerce and the production of animal and vegetable products. Then the natural resources of the different countries of the world are treated with especial emphasis upon those of the United States.

Specimens from the Commercial Museum will be used by the students in making reports on the production and manufacture of the principal raw materials and their relation to the development

of the countries from which they come. The course presupposes a fair knowledge of physical and political geography and of general history.

Freshman year; first semester; 3 credits; 3 recitations.

202. **COMMERCIAL GEOGRAPHY.** This division of the work of Commercial Geography is especially adapted to students in the Engineering courses. Along with 212, it forms a year's work, aiming to give the student an economic training especially suited to his particular field of activity.

More stress will be laid upon geographic conditions as they determine the problems of transportation and commerce. Climatic conditions and the principal raw materials will be taken up as determining the progress and localization of population and industry. The importance of these raw materials of commerce, and the supplies available in our own and other countries will be treated in detail.

Textbooks, lectures, and reports.

Engineering students; sophomore year; first semester; 3 credits; 3 recitations. Credit not given except when followed by 212.

205. **HISTORY OF COMMERCE.** The beginnings of agriculture and the industrial arts in the great Asiatic river valleys of China, India, Mesopotamia, and Egypt are sketched. The origin of commerce, by which the products of these ancient civilizations were exchanged and made common property, is outlined. The commercial achievements of the Phoenicians, Greeks, and Romans, in relation to the westward progress of civilization, are taken up. The rise of modern commerce out of the chaos of medieval Europe; the Mohammedan occupation of Spain; the effects of the Crusades; the achievements of Portugal, Spain, Holland, and France, are considered. The main stress of the course will be laid upon the industrial development of Great Britain, as a basis for the study of the United States, in Course 206.

Freshman year and second year of two-year Business Course; second semester; 3 credits; 3 recitations.

206. **ECONOMIC HISTORY OF THE UNITED STATES.** This course follows and develops out of the previous work in Commercial Geography and the History of Commerce. On the basis of a knowledge of our natural resources and of the previous commercial and economic development of the world, we attempt to outline and

interpret the economic progress along many lines which has been made by the United States. The development of agriculture, the growth of manufacturing, the improvement of transportation, the history of labor organization and legislation, the evolution of our monetary and credit systems, changes in the protective tariff, etc., are traced from Colonial times onward.

Prerequisites: Commerce 200, 205.

Sophomore year; first semester; 3 credits; 3 recitations.

210. PRINCIPLES OF ECONOMICS. A general course covering the elementary problems of our industrial and commercial organization, including the nature of wealth, its production and consumption, and the different forms in which it is found; the conditions underlying its success in agriculture and manufacturing; the localization of industry and the relation of raw material to manufacturing; the law of diminishing returns; division of labor and efficiency in production; exchange and distribution and their dependence upon the price-making process; the factors determining prices, wages, interest and rent; the problems of taxation; public expenditures; protection and free trade; money and banking; labor problems and transportation.

Textbook, lectures, and reports on assigned readings.

Prerequisites: 200 and 206.

Sophomore year; second semester; 3 credits; 3 recitations.

211. PRINCIPLES OF ECONOMICS. A course especially adapted for students in Home Economics. Not open to Commerce students.

Textbook and lectures. Junior year; first semester; 2 credits; 3 recitations.

212. PRINCIPLES OF ECONOMICS. This course forms a continuous year's work with Commercial Geography 202. In this division the elementary principles will be covered in a brief outline and the student will then take up, by means of lectures and selected readings, such problems as are especially important from the viewpoint of engineering students. Such problems are the nature, organization, and claims of trades unionism; the special problems of labor management from the standpoint of the employer; the economic problems of transportation, and a discussion of the modern trust movement, with attempts at legislative control. Textbook, lectures, and reports. Not open to Commerce students; must be taken in connection with Commerce 202.

Engineering students; sophomore year; second semester; 3 credits; 3 recitations.

213. **LABOR PROBLEMS.** This course begins with a brief historical review of the rise of a labor class. The influence of occupation upon the laborer; and the different types of labor and the problems involved in the occupations represented by the several technical departments of the College, will be studied. Then follows the beginnings of organization; the structure, aims, methods of offence and defence, and achievements of associations of labor. The trade agreement, the strike, the boycott, the lockout, methods of conciliation and arbitration, the application of the injunction in labor disputes, the political activity of labor organizations, employers' liability, legislation, workingmen's insurance, profit sharing and cooperation in relation to labor problems, will be taken up with the aid of a textbook, lecture, and assigned readings. Studies will be made of typical, historical and current labor disputes and embodied in term papers and class discussion.

Prerequisite: Commerce 210.

Sophomore or junior year; second semester; 3 credits; 3 recitations.

219. **AGRICULTURAL ECONOMICS.** The fundamental principles of production, distribution, and consumption are taken up with especial reference to agriculture. The aim of the course is to acquaint the student with the laws of supply and demand and the influences determining them. A brief history of agricultural production is taken up, showing the growing complexity of the economic problems of taxation, transportation, marketing, etc., as the transition is made from self-sufficing, general farming to localized, commercial agriculture.

Textbooks and lectures; junior year; first semester; 3 credits; 3 recitations.

230. **MONEY AND BANKING.** (a) *Money*: The nature and functions of money, legal tender, Gresham's law, coinage; the factors affecting prices, and their relation to business conditions; a brief history of the various forms of paper currency; silver legislation; present problems and conditions.

(b) *Banking*: Procedure in organizing state and national banks; history of banking, including our National Banking System as modified by the Federal Reserve Bank Act of 1913; the functions

of banks; the preparation and analysis of bank statements; loans and the granting of credit, securities required; rediscount; duties of the various bank officers; legal principles of banking; the principles underlying foreign exchange; a comparison of our banking system with that of foreign countries. Textbook, lectures, assigned readings, and reports.

Prerequisite: Commerce 210.

Junior year; first semester; 3 credits; 3 recitations.

233. PUBLIC FINANCE. An examination will be made of public expenditures, local, state and national. For this purpose, typical financial budgets and reports will be analyzed. A history of reforms calculated to secure efficiency in these expenditures will be sketched. The various forms of taxes, customs, and fees whereby revenues are raised, will be taken up in detail and their apportionment studied in relation to the budgets previously analyzed. Present systems of land taxation will be studied in the light of proposed reforms. An attempt will be made to give the student some laboratory practice through the study of local systems of assessment and the resulting apportionment of taxes.

Senior year; first semester; 3 credits; 3 recitations.

235. INSURANCE. A course designed to cover, in a general way, the whole field of insurance. The nature and statistical basis of different kinds of insurance will be first treated. Then the application of the principles discovered to different forms of insurance, such as straight life, endowment, accident, industrial, old age, fire, live stock, hail, etc., will be taken up in detail. Text, lectures, and library work.

Elective; junior or senior year; second semester; 3 credits; 3 recitations.

240. TRANSPORTATION. The relation of transportation systems to industrial and commercial progress; a brief historical review of the development of systems of transportation; the organization and financing of different systems; the effects of competition in the railroad business; freight classification, and the making of rates and fares; the necessity of government control, and attempts at regulation by state and federal governments; government ownership in the light of European experience. Text, lectures, and assigned readings.

Senior year; second semester; 3 credits; 3 recitations.

250. PRACTICAL SOCIOLOGY. In this course, social theory will be subordinated to the study of practical social problems. The different social and political units, such as the family, school, church, club, city, state, and nation will be discussed in their relation to the general welfare. This will necessitate an examination of the organization, purpose, and methods of each of these functional groups, involving a discussion of the training of children, employment of women and children, marriage and divorce; the labor movement as a factor in the struggle for existence; overcrowding in city slums, and its amelioration; the causes of pauperism, immorality, and crime, with modern methods of their treatment, etc. A good general textbook will be studied and the whole field covered in class discussion and assigned readings.

Sophomore year; second semester; 3 credits; 3 recitations.

251. PRACTICAL SOCIOLOGY. Course 250 especially adapted for students in Home Economics. Not open to students of Commerce. Textbook and lectures.

Junior year; second semester; 2 credits; 3 recitations.

252. RURAL SOCIOLOGY. This course will deal with the special problems of the rural family, the rural school, the rural church, rural societies and associations, and the relation of the State to the general rural welfare. This will involve an inquiry into the prevailing ideals of the rural community regarding labor and leisure; art, literature, and music; and the necessity for recreation. Recent progress in adapting education to rural needs will be discussed. City over-crowding will be examined from the rural point of view, and the lessons which the rural community can learn from the progress made by cities in solving their problems, will be emphasized. The social and educational effects of the telephone, free mail delivery, rural press, and improved methods of agricultural production and exchange, will be discussed in detail. The best textbooks in the field will be carefully studied, and the whole ground covered in class discussion and assigned readings.

Elective for juniors and seniors in Agriculture and for such juniors and seniors in Domestic Science as may prefer this course to the one in Practical Sociology; second semester; 3 credits; 3 recitations.

254. NATIONAL VITALITY. A one credit course, covering the general field of national vitality, its importance, the conditions un-

derlying it and the means of maintaining such conditions. The economic and social waste due to disease, alcohol, and vice will be treated in a series of lectures by experts from different departments of the College. Outside specialists will also be secured to lecture upon particular phases of the subject. Besides taking notes on the lectures, each student will be required to make an abstract of not less than three hundred pages of assigned readings.

Elective for all students; first semester; 1 credit; 1 recitation.

260. COOPERATION. This course takes up the origin and development of the cooperative movement in Europe, and its introduction into the United States. It sets forth the general principles underlying the economic and social activities of cooperative associations. Then, following this, the different types of organization, the methods by which they are formed, their working plans in different enterprises, and the factors which determine their success or failure, will be studied in detail. The store, the factory, the dairy and cow-testing association, the credit organization, etc., will be taken up systematically, and the advantages and difficulties of cooperation will in each case receive careful analysis.

Elective for juniors and seniors who cannot take 264 and 265, and who have had considerable training in political economy; junior or senior year; second semester; 3 credits; 3 recitations.

264. THE ECONOMIC ORGANIZATION OF AGRICULTURE. This course, together with 265, is designed to give a more specialized training in the economic problems of agriculture than is possible in the general course outlined under 219.

In both courses, 264 and 265, economic problems are discussed from the standpoint of the efficiency to be attained through closer organization. Existing associations of farmers both in this country and in Europe will be carefully studied by means of sample constitutions and by-laws, and also by lantern-slide illustrations of the work actually being accomplished through cooperation in Europe and America. The aim is to turn out men trained to play their part in the revolution in agricultural business methods which is now sweeping over this country.

(a) *Economic Problems of Production and Marketing*: Old methods and their weakness are examined, and the possible savings through organized business are investigated.

(b) *The Purchase of Farm Supplies:* The purchasing end of the farm business is about as important as the selling of farm products. Present methods will be taken up in detail, and the possibility of eliminating waste and duplication thoroughly discussed and illustrated.

(c) *The Problems of Transportation as Affecting the Farmer:* The economic significance of the good roads movement will be dealt with; systems of rail and water transportation will be taken up, government control discussed, and the possibility of eliminating waste through precautions on the part of the shippers pointed out.

Open to all who have had 219 or its equivalent; junior year; first semester; 3 credits; 3 recitations.

265. RURAL FINANCE. (a) *Rural Credit.* The principles of money, credit, and banking will be sufficiently studied to lay the foundation for the examination of the credit needs of rural communities, and the most economical means of satisfying them. The reasons why farmers have been so poorly served by existing credit institutions will be investigated. The credit institutions of Europe will be compared with those of the United States; the development of cooperative credit in European countries will be carefully studied, and the present widespread movement to adapt cooperative credit institutions to American rural conditions will be closely followed.

(b) *Rural Insurance.* The basis of insurance of different kinds will be taken up, and applied to agricultural needs; old line, mutual, and fraternal organizations will be examined from the standpoints of efficiency and safety.

(c) *Rural Taxation.* The general principles of public finance will be taken up in so far as may be necessary to lay the foundation for an intelligent discussion of rural taxation; existing systems, as well as proposed reforms, will be examined.

Open to all who have had 219 or its equivalent; junior year; second semester; 3 credits; 3 recitations.

270. PROBLEM COURSE. Students especially interested in Applied Economics may select some problem within the scope of the work characteristic of the College, and under the direction of the instructor in charge prepare a thesis embodying the results of an investigation made during the senior year.

Senior year; both semesters; consultation by appointment; 1 credit each semester.

POLITICAL SCIENCE

K. CIVIL GOVERNMENT AND ADMINISTRATION. (a) *Civil Government*: Our European ancestors; origin of states and state institutions. English and American governments compared; federal and state constitutions; state and foreign service; the executive departments; federal and state power; political parties and issues.

(b) *Federal and State Administration*: A survey of the administrative activities of federal, state, and municipal governments; governments from the sociological point of view. The financial operations, preparation of budgets and reports, will be considered.

Two-year Business course; first year; second semester; 3 credits; 3 recitations.

L. COMMERCIAL LAW. Adapted to students of limited training. A course covering the general principles of contracts, and particular contracts including sales of goods, bailment, insurance, credits, and loans.

Two-year Business course second year; and Mechanical Arts third year; first semester; 2 credits; 2 recitations.

M. COMMERCIAL LAW. A continuation of Course L, including negotiable instruments, agency, partnership, corporations, and property.

Two-year Business course; second year; second semester; 2 credits; 2 recitations.

300. ADVANCED COMMERCIAL LAW. (a) *Contracts in General*: Formation of contracts, offer, acceptance, form, and consideration; competence of parties, consent, and legality of subject matter; operation of contracts, including limit of obligations and assignments; interpretation, rules of evidence, and construction; discharge of contracts; the agreement, performance, breach of contract, etc.

(b) *Negotiable Instruments*: Maker's, acceptor's, drawer's and indorser's contracts; proceedings before, upon, and after dishonor; proceedings in protesting; accommodation paper; grantor and surety; holder's position, defense, equities, agency, insurance, etc.

Sophomore year; first semester; 3 credits; 3 recitations.

301. **ADVANCED COMMERCIAL LAW.** (c) *Partnership Law:* Formation of partnerships, essentials, liabilities of members, capital, profits, good will, individual and firm property; agency for partners; dissolution winding up; priority of distribution, etc.

(d) *Corporation Law:* Kinds, formation, powers, liabilities, ownership, shares, subscription, calls, notice, transfers, management, officers, directors, contractual powers, dividends, dissolution, are discussed fully from the legal point of view.

(e) *Property:* Classes, method of acquiring and transferring titles, mortgages, lease, landlord and tenant, etc. The case method is used throughout the entire course. Lectures, reports, and discussions.

Sophomore year; second semester; 3 credits; 3 recitations.

302. **INTERNATIONAL RELATIONS.** Persons concerned, rights and duties of states; territorial jurisdiction; jurisdiction on the high seas; agents of the state treaties; settlements of disputes; war and its effects; military occupation; neutrality, contraband, blockades, etc. Lectures, reports, and discussions.

Senior year; first semester; 3 credits; 3 recitations.

306. **COMMERCIAL LAW.** A short course in the laws of business. Recitations and discussions.

Pharmacy and Farm Management students.

First semester; 3 credits; 3 recitations.

320. **NATIONAL GOVERNMENT.** (a) *National Government:* The Constitution; rise of the American Union; distribution and powers of the Government; powers of Congress; powers of the executive; the judicial departments; checks and balances of governments; governments of territories and colonies; admission of new states; amendments to the Constitution; civil rights and their guarantees; protection of persons accused of crimes; protection of contracts and property, etc. Lectures, readings, reports, and discussions.

(b) *American Politics:* Origin of political parties in the United States; changes, growth, and development; party platforms.

For juniors and seniors; first semester; 3 credits; 3 recitations.

322. **STATE AND MUNICIPAL GOVERNMENT.** A study of the functions of state government; the machinery of state government; po-

litical parties in state government; special study of the government of the State of Oregon; municipal government, including county, town, and city government.

Lectures, readings, reports, and discussions.

For juniors and seniors; second semester; 3 credits; 3 recitations

325. COMPARATIVE GOVERNMENTS. A critical study of the governments of the principal countries of the world, with special emphasis on modern movements and features of government, that are problems in the United States at present.

Lectures, reports and discussions.

Senior year; second semester; 3 credits; 3 recitations.

STENOGRAPHY AND OFFICE TRAINING

The following courses are offered:

R. TYPEWRITING AND OFFICE TRAINING. (a) *Typewriting*: See description of course 400 (b). Open only to Commerce Vocational students.

(b) *Office Training*: See description of course 410 (b).

Commerce vocational course; first year; first semester; 2 credits; 1 lecture; 5 laboratory periods of one hour each.

S. TYPEWRITING AND OFFICE TRAINING. A continuation of course R.

Commerce vocational course; first year; second semester; 2 credits; 1 lecture; 5 laboratory periods of one hour each.

400. ELEMENTARY STENOGRAPHY AND TYPEWRITING. (a) *Gregg Shorthand*: Theory manual covered thoroughly. Shorthand penmanship given special attention. Dictating machines used in preparation of assignments for class work.

(b) *Rational Typewriting*: The theory and practice of touch typewriting, covering mastery of the alphabet, numerals, mechanical arrangement of business correspondence and legal forms, tabulating, and speed practice. Special attention is given to the mechanics of the typewriter.

Degree course sophomore year and Vocational course first year; 4 credits; 5 recitations; 5 laboratory periods of one hour each.

Students starting Stenography, having had previous training in typewriting, will not be excused from 400 (b); budgets of an advanced character will be assigned them. Credit will not be given for the first semester's work unless the full year is taken.

401. **ELEMENTARY STENOGRAPHY AND TYPEWRITING.** A continuation of course 400. Speed Practice finished through the principal series and phrase letters. Elementary office equipment studied and used.

Degree course sophomore year and Vocational course first year; second semester; 4 credits; 5 recitation periods; 5 laboratory periods.

402. **ADVANCED STENOGRAPHY AND TYPEWRITING.** Dictation covering vocabularies of representative businesses, such as real estate, law and collections, banking and financial, life and fraternal insurance, publishing, railway, manufacturing, civil service. The typewriting periods will be taken up with transcription of dictation.

Course 412 must be taken concurrently with this course by degree students.

Degree course junior year and Vocational course second year; first semester; 4 credits; 5 recitations; 5 laboratory periods of one hour each.

403. **ADVANCED STENOGRAPHY AND TYPEWRITING.** A continuation of course 402. Court and lecture reporting introduced. Course 413 must be taken concurrently with this course by degree students.

Degree course junior year and Vocational course second year; second semester; 4 credits; 5 recitations; 5 laboratory periods of one hour each.

404. **EXPERT SPEED COURSE.** Designed for those having finished course 403 and desiring to specialize in court or convention reporting. All students desiring to specialize in methods of teaching commerce enroll in course 180 Industrial Pedagogy, which will be given at the same hour as this course.

Elective; senior year; first semester; 2 credits; two lectures;

405. **EXPERT SPEED COURSE.** Continuation of course 404.

Elective; senior year; second semester; 2 credits; 2 lectures.

410. **GENERAL OFFICE TRAINING.** Designed especially for students not enrolling in Stenography, but who desire a knowledge of Typewriting and Office Appliances. (a) *Typewriting*: Covering the same ground as course 400 (b). 1 credit will be given for this part to Agricultural students. *Not open to Commerce students.*

(b) *General Office Methods.* Office records and systems, relation between employer and employee, office equipment and its efficient arrangement. Especial attention will be given to training students in office methods that apply to their particular branch of work.

Elective all courses but Commerce; first semester; 2 credits; 5 laboratory periods; 1 lecture period of one hour.

411. GENERAL OFFICE TRAINING. Continuation of 410. *Not open to Commerce students.*

Elective all courses but Commerce; second semester; 2 credits; 5 laboratory periods; 1 lecture period of one hour.

412. OFFICE TRAINING FOR STENOGRAPHERS. Designed to give such knowledge and training as is called by employers, "experience." This course is so arranged that it is an integral part of course 402, Advanced Stenography and Typewriting. Topics covered: Attractive arrangement of business letters; applying for a position; office routine; inclosures, remittances, and banking; filing systems; office appliances; shipping information; business ethics and bibliography; legal papers and transactions; telegraph and telephone; printing and proofreading; a day's work co-ordinated into an organized whole.

Junior year; first semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each. Required of all taking course 402.

413. SECRETARIAL TRAINING FOR STENOGRAPHERS. Continuation of course 412. Actual service in the College administrative offices required. Office efficiency problems studied.

Junior year; second semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each. Required of all taking course 403.

414. BIBLIOGRAPHY. Advanced library training for secretaries and others, in order that they may know where and how to find quickly all information regarding any important field of knowledge. Twelve lectures and problems will be given by experts in the various fields, covering the main principles, chief authorities, and the sources of material.

Dewey Decimal Classification: 3 lectures and problems by the College Librarian. Subject Headings: three lectures and problems, by College Cataloguer.

Elective; junior year; second semester; 1 credit; 1 lecture.

PHARMACY

The following courses are offered:

100. NOMENCLATURE. The Latin language is universally recognized as the language of science. The names of all plants and animals and of many natural objects in the material world are recorded in this language. These Latin names, in so far as they have connection with the profession of pharmacy, are made the subject of systematic study.

Sophomore year; first semester; 2 credits; 2 recitations.

101. NOMENCLATURE. This is a continuation of course 100. Sophomore year; second semester; 2 credits; 2 recitations.

102. NOMENCLATURE. A continuation of course 101.

Elective; sophomore or junior year; first semester; 2 credits; 2 recitations.

103. NOMENCLATURE. A continuation of course 102.

Elective; sophomore or junior year; second semester; 3 credits; 3 recitations.

110. GENERAL PHARMACY. This course is a general introduction to the subject of pharmacy, given by means of a series of lectures wherein the student is made familiar with the conditions which led to the origin of the practice of pharmacy as a profession separate and distinct from that of medicine. Attention is directed to the purposes of the profession, to the scientific principles underlying it, and to the proper means for comprehending these facts with a view to their intelligent application.

The drugs, chemicals, and prepared medicines of the U. S. Pharmacopoeia are made the subject of a series of recitations.

Junior year; first semester; 3 credits; 3 recitations.

111. GENERAL PHARMACY. A continuation of Pharmacy 110, to which is added the feature of laboratory practice. The student takes up the various classes of pharmaceutical preparations and becomes familiar with the correct manner of their manufacture.

Experience has demonstrated the value of the laboratory as a factor in technical and scientific education. For this reason the course in pharmacy as offered at this institution is one in which this feature is given unusual prominence.

From crude drugs, as barks, leaves, roots, and seeds, the student manufactures finished pharmaceuticals, such as tinctures, fluid extracts, elixirs, tablets, pills, etc.

Using the United States Pharmacopoeia as a laboratory manual, the student has the official requirements for purity and strength constantly before him, his attention thus being directed to these matters in a practical way.

Junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods.

112. GENERAL PHARMACY. A continuation of course 111, in which the manufacture of the more difficult pharmaceuticals is taken up. Attention is given to the higher class of toilet preparations, as well as to galenicals.

Senior year; first semester; 2 credits; 2 laboratory periods.

113. GENERAL PHARMACY. A continuation of course 112.

Elective; senior year; second semester; 2 credits; 2 laboratory periods.

120. THERAPEUTICS AND DOSES. The definition of medical and therapeutical terms, the classification of medicines into groups according to their therapeutical action, and the consideration of the subject of dosage, are matters to which the attention of the student is directed at this time.

Junior year; first semester; 2 credits; 2 recitations.

130. PHARMACOGNOSY. This subject deals with the scientific classification of the plants and animals which furnish the crude drugs used in pharmacy. The relation existing between the various drugs is shown, and the student is thoroughly drilled in memorizing the classifications, and in learning from what parts of the world the drugs are obtained. He is instructed as to what particular portion of the plant or animal finds use in medicine and learns to recognize by some physical characteristic—appearance, odor, taste, etc.—samples of all the important drugs. Extensive cabinets of sample drugs are kept for this purpose.

Junior year; first semester; 3 credits; 3 recitations.

131. PHARMACOGNOSY. Continuation of course 130.

Junior year; second semester; 3 credits; 3 recitations.

140. MATERIA MEDICA AND TOXICOLOGY. As indicated by the name, this course is devoted to the study of "Medicinal Materials."

All substances which find general use in medicine are here given attention. All are classified with respect to the action they have upon the human system. Crude drugs are grouped according to the plant constituents—alkaloids, glucosides, volatile oils, oleoresins, etc.—which they contain. Pharmaceutical preparations are studied with respect to composition and strength; chemicals according to solubility, medicinal activity, and incompatibility.

The student is drilled in the recognition of pharmaceutical preparations and of chemicals. The many common names, or synonyms, in use in connection with *materia medica* are memorized.

One hour a week is devoted to the consideration of Toxicology. The different classes of poisons—caustics, irritants, convulsants, paralyzants, narcotics, asphyxiants, etc.—are taken up and studied according to the characteristic symptoms they produce, the method of counteracting and preventing their harmful effects, and the antidote peculiar to each. This course is especially designed to meet the needs of the pharmacist. Provisions of the law regulating the sale of poisons within the State are explained in detail.

Senior year; first semester; 3 credits; 3 recitations.

141. MATERIA MEDICA AND TOXICOLOGY. A continuation of course 140.

Senior year; second semester; 3 credits; 3 recitations.

142. MATERIA MEDICA. A continuation of course 141. Advanced work for senior students who complete course 141 during their junior year.

Elective; senior year; first semester; 3 credits; 3 recitations.

143. MATERIA MEDICA. A continuation of course 142.

Elective; senior year; second semester; 3 credits; 3 recitations.

150. PRESCRIPTION PRACTICE. This work is sometimes spoken of as "extemporaneous pharmacy," and is justly regarded as the division of the profession belonging to the expert. The ability to compound properly intricate formulas at a moment's notice, is an art that can be acquired only by persistent study and painstaking practice. Opportunity for practice of this nature is here given. Prescriptions written by practicing physicians in various parts of the country have been collected. These afford the student practice in reading, itself often a matter of difficulty. Prescriptions pre-

senting various types of incompatibility are compounded, as are others which afford experience in overcoming manipulative difficulties.

Senior year; first semester; 3 credits; 3 recitations.

151. PRESCRIPTION PRACTICE. A continuation of course 150.

Senior year; second semester; 6 credits; 3 recitations; 3 laboratory periods.

160. COMMERCIAL PHARMACY. In this course various problems arising in the physical management of the store are considered. The selection of proper types of fixtures, correct methods of stock arrangement, and harmonious effects in show-window dressing are topics receiving attention. Instruction in the art of sign-card painting, including extensive practice with the air brush, is given. At various times during the year special lectures will be delivered by successful business men of the State.

Elective; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

161. A continuation of course 160.

Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

INDUSTRIAL PEDAGOGY

PROFESSOR RESSLER

PROFESSOR BROOKS

PROFESSOR BRANDON

PROFESSOR GRIFFIN

ASSISTANT PROFESSOR MILAM

ASSISTANT PROFESSOR BLANCHARD

The department of Industrial Pedagogy offers courses for the preparation of teachers in the subjects of Agriculture, Home Economics, Commerce, and Manual Training. The importance of providing special instruction in the industries for the pupils of the public schools is fully recognized in this country. The material equipment in the way of laboratories, workshops, experimental fields, etc., is easily secured. Specially trained teachers cannot be prepared overnight. There is a real danger that the public will underestimate the scientific and educational significance of the new education. The industrial branches cannot be taught from textbooks nor by teachers without technical training.

There must also be special supervisors in each of the industrial branches for the larger schools, where instruction is given to a large number of pupils under both trained and untrained teachers. Supervisors who will do some regular teaching, are also required where a number of small town and country districts are grouped for industrial instruction. In time, we may expect the grade teachers to have secured through the high and normal schools the technical training that will enable them to teach the industrial branches under direction. Until that time, most of the teaching must be done by the special instructor.

The department of Industrial Pedagogy gives the professional training and advises with the students and deans of the various schools in the selection of the technical courses. In conjunction with the other departments concerned, tentative courses of study are prepared in each of the industrial branches, adapted to the age of the pupils and the social demands on the school. This department undertakes to assist teachers in the work of instruction, by general and special suggestions through college and other publica-

tions, and by correspondence and visitation where possible. Detailed lists of equipment and apparatus, with cost, suitable for small and large schools, will be furnished on request.

Students electing this course will be registered in the school in which their distinctive subject is given. Thus those who desire to prepare to teach and supervise Agriculture in the high school and grammar grades will be registered in the School of Agriculture and will receive their degrees in Agriculture on completion of the requirements.

In the same way students, desiring to prepare to teach Home Economics and Commerce will be registered in the schools of Home Economics and Commerce. A special degree course in Industrial Arts, described under that heading, has been organized for the preparation of teachers of Manual Training.

The following courses will be offered during 1914-15:

101. GENERAL PSYCHOLOGY. A study of general psychology by lectures, recitations, and reports; a description of the facts and laws of mental activities with applications to the ordinary affairs of life; demonstrations and experiments showing the relation of mental life to the nervous system; the significance of habit in conduct and character.

Junior or senior year; first semester; 3 credits; 3 recitations.

102. EDUCATIONAL PSYCHOLOGY. The application of the facts and principles of psychology to teaching; a study of the growth of the child mind and the relations of the various periods to educational organization; adaptation of courses of instruction, methods of teaching, discipline, and general school activities to the stages of the pupil's development; lectures, recitations, reports, and simple investigations.

Junior or senior year; second semester; 2 credits; 2 recitations.

120. HISTORY OF EDUCATION. A general review of the growth and development of education and its relation to the civilization of the times; particular attention given to the rise of industrial education of Europe and America, and its place in the social and political life of the country.

Sophomore or junior year; second semester; 3 credits; 3 recitations.

130. SCHOOL MANAGEMENT. A study of the organization of the school, including the relations and duties of pupils, teachers, super-

visors, and school board. The place of the special teacher in the system; questions of discipline; practical exercises in making programs, keeping records, filling out reports, and performing other duties required by the Oregon School Law.

Sophomore or junior year; first semester; 3 credits; 3 recitations.

140. GENERAL METHOD. The principles of teaching, including method of the recitation, preparation of lesson plans, and observations of model teaching; library references to periodicals and current literature relating to public school agriculture, domestic science and art, commerce, and manual training.

Junior or senior year; first or second semester; 3 credits; 3 recitations.

150. SPECIAL METHOD IN AGRICULTURE. A careful, detailed study of the public school course in Agriculture, in its various relations, including the other subjects in the curriculum, preparation for college, farming, community life, etc. Model courses for both elementary and secondary grades are construed with plans for all desired equipment for laboratory, library, field work, including cost. Lesson plans on typical subjects, observation and model lessons, practice teaching, and extension work with school children and adults, provide additional opportunities to enable the students to reduce theory to practice.

Required of Agricultural seniors majoring in Industrial Pedagogy; elective for all other seniors in Agriculture; senior year; second semester; 3 credits; 2 recitations; 1 library period.

151. EXTENSION METHODS IN AGRICULTURE. This is a special course designed to prepare the graduate for such duties as are incumbent upon County Agricultural Agents, members of the College Extension Staffs, and high school agriculturists. The work, which consists largely of lectures and reports upon assigned reading, deals with the social, economic, and educational phases of agriculture. Practical experience in extension work will be given members of the class so far as possible.

Required of Agricultural seniors majoring in Industrial Pedagogy; elective for all other seniors in Agriculture; senior year; second semester; 1 credit; 1 recitation.

160. SPECIAL METHOD IN HOME ECONOMICS. Same as course 150 applied to the public school course in Home Economics.

Senior year; first semester; 3 credits; 3 recitations.

161. SPECIAL METHOD IN HOME ECONOMICS. Continuation of course 160, applied to Domestic Science.

Senior year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

162. SPECIAL METHOD IN HOME ECONOMICS. Continuation of course 160, applied to Domestic Art.

Senior year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

170. SPECIAL METHOD IN MANUAL TRAINING. Same as course 150, applied to the public school course in Manual Training.

Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

180. SPECIAL METHOD IN COMMERCE. Same as course 150, applied to the public school course in Commerce.

Senior year; first semester; 2 credits; 1 recitation; 2 laboratory periods.

181. SPECIAL METHOD IN COMMERCE. Continuation of Course 180.

Senior year; second semester; 2 credits; 1 recitation; 2 laboratory periods.

190. SCHOOL ADMINISTRATION. A discussion and analysis of the American system of education, with an interpretation of the purpose and spirit of each division; problems of administration and teaching in the public schools; the correlation of the industrial branches with the other subjects in the curriculum. Lectures, reading, reports, and studies on the Oregon schools.

Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

191. SCHOOL HYGIENE. A course in the health provisions requisite for the hygienic conduct of education. This includes a discussion of ventilation, heating, light, seating, physical exercise in the school room and on the playground, games, medical inspection, tests for physical defects, disinfection, quarantine, and other similar topics. Oregon laws relating to these matters will be studied, and the regulations of the State Board of Health and other State and local health authorities will be explained in detail. Advanced investigations in other states will also be presented and comparative studies made. Lectures, reports, and first-hand investigations on town and country school conditions, so far as practicable.

Elective for advanced or graduate students; first semester; 2 credits; 2 recitations.

192. CHILD STUDY. This includes the physical and mental characteristics of children and youth as contrasted with those of mature men and women. The relation of physical growth and development to the unfolding of mental powers; the instincts and their relation to the development of individuality, sense of responsibility to others, moral development, etc.; abnormalities; study and treatment of children as individuals and in class groups; and discussion of the social and economic implications as well as the psychological. Lectures, reports, and simple tests and records made by visitation of schools.

Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

200. RESEARCH. Advanced or graduate students who are qualified by previous training or experience, may register for extended investigation of some specific problem in industrial education. The studies may be historical, either European or American; administrative; or in the field of method. General government and state reports; publications by special commissions; reports of committees of educational organizations; contributions by departments of colleges and universities; educational and other periodicals; and original investigations into Oregon conditions, compose the material to be used. These studies will be assigned and outlined by the instructor and stated reports made from time to time by the student. Regular hours will be assigned the individual students and credit given according to the amount of work done.

Elective for advanced or graduate students; first semester; 2 credits.

201. RESEARCH. Continuation of course 200.

Elective for advanced or graduate students; second semester; 2 credits.

202. RESEARCH. As outlined in course 200.

Elective for advanced or graduate students; first semester; 4 credits.

203. RESEARCH. Continuation of course 202.

Elective for advanced or graduate students; second semester; 4 credits.

ART AND ARCHITECTURE

PROFESSOR McLOUTH

MR. ROBINSON

MISS FLARIDA

ART

The department of Art offers no regular courses in Art with the idea of instruction in the Fine Arts in view, but only as art education relates to highest ideals in everyday life, and to meet the requirements of art in the industries. Courses in drawing, composition, light and shade and color are planned and given for the purpose of facilitating instruction in the applied arts courses—design, metal work, clay modeling, and the ceramic art; and in the work of such other departments as Architecture, Domestic Art, and Industrial Arts.

The following art courses not only develop utilitarian ideas, but they also cultivate an appreciation and love of the beautiful in nature and art.

102. FREE-HAND DRAWING. This course covers work in representation; still life in line and dark and light; free-hand perspective of circles and linear perspective; some of the principles of composition and design; historic ornament; the handling of pencil and charcoal, or brush and ink.

The degree course in Home Economics; freshman year; first semester; 2 credits; 3 studio periods of two hours each.

103. BEGINNING COMPOSITION. The study of design principles and color harmony applied to concrete problems of dress or home decoration; crayon, charcoal, and water color are used as media. Some historic design is studied.

Prerequisite: Drawing 102.

The degree course in Home Economics; freshman year; second semester; 2 credits; 3 studio periods of two hours each.

204. DESIGN AND COLOR DRAWING. Design and color continued. Design from nature forms in line, dark and light and color. Landscape forms as a basis of design. A practical application of design and color will be made by means of block printing or stenciling on textiles.

Prerequisites: Courses 102, 103.

Degree course in Home Economics; sophomore year; first semester; 2 credits; 3 studio periods of two hours each.

205. WATER COLOR. The courses in water color are offered as elective cultural subjects and are open to any student who has completed courses 102, 103, and 204 or their equivalent. The work of the first semester will include simple flat washes of geometric casts, and flat color washes of still life subjects of broad area.

First semester; 2 credits; 3 studio periods of two hours each.

206. WATER COLOR. A continuation of course 205, leaving flat washes and taking up more complex still life studies. These courses are open to all students after the required prerequisites in drawing and course 205.

Second semester; 2 credits; 3 studio periods of two hours each.

305. ADVANCED DESIGN. An elective offered to give a broader working knowledge of design principles which shall serve as a guide to selection, adaptation, and composition, both structural and decorative, for practical application in interior decoration, costume design, and for articles of personal and household use.

Prerequisites: Courses 102, 103, and 204.

First semester; 2 credits; 3 studio periods of two hours each.

306. ADVANCED DESIGN. A continuation of course 305.

Prerequisites: Courses 102, 103, 204, and 305.

Second semester; 2 credits; 3 studio periods of two hours each.

410. INDUSTRIAL ARTS DRAWING. Free-hand working sketches of wood joints, furniture, and machine parts; and drawing from written descriptions.

Prerequisite: Course 503.

The degree course in Industrial Arts; first semester; 1 credit; 1 studio period of three hours.

M. E. Vocational course; first year; second semester; 1 credit; 3 studio periods of one hour each.

411. INDUSTRIAL ARTS DESIGN. A course in the principles of design suited to the Industrial Arts course. Original design plates of door and cabinet paneling, metal parts—hinges, escutcheons, draw pulls, etc.,—and furniture will be required.

Prerequisites: Courses 503 and 510.

The degree course in Industrial Arts; second semester; 2 credits; 3 studio periods of two hours.

412. INDUSTRIAL ARTS DESIGN. A continuation of course 411. Prerequisites: Courses 503, 410, and 411.

The degree course in Industrial Arts; second year; second semester; 1 credit; 1 studio period of three hours.

413. CLAY MODELING. The study of good pottery forms, and the making and decoration of pottery, occupies most of the time of this course. Some work in plaster casting, also the building of tiles and modeling in low relief.

Prerequisites: Courses 102 and 103.

Elective; the degree course in Home Economics; senior year; first semester; 2 credits; 3 studio periods of two hours each.

414. CLAY MODELING. A continuation of course 413, with a study of glazes and firing of pottery.

Prerequisites: Courses 102, 103, or their equivalents, and 413.

Elective; the degree course in Home Economics; senior year; second semester; 2 credits; 3 studio periods of two hours each.

503. FREE-HAND DRAWING. The purpose of this course is to teach the student to see correctly, to judge accurately, and to give him such a knowledge of drawing and such a training as will best and most fully meet the demands of his subsequent work.

The course consists of the principles of drawing and free-hand perspective, line drawing in charcoal and pencil from geometric forms, block casts and simple still life. Much attention is given to neatness and to accurate proportion.

Course in Architecture and Industrial Arts; freshman year; first semester; 1 credit; 3 studio periods of one hour each.

M. E. Vocational course; freshman year; first semester; 1 credit; 3 studio periods of one hour each.

504. PEN AND PENCIL RENDERING. The beginning course in the study of methods of architectural expression. The work is designed to give to the student an insight into the handling of pencil and pen. Free-hand drawings from casts of architectural ornament, and the portrayal of building materials, such as brick, wood, stone, terra cotta, and stucco, followed by sketching of details of buildings.

Degree course in Architecture; freshman year; second semester; 2 credits; 3 studio periods of two hours each.

505. **WATER COLOR RENDERING.** The purpose of this course in water color rendering is to give a knowledge of the handling and use of the brush and color in the expression of architectural subjects, detail, and decoration.

Degree course in Architecture; sophomore year; first semester; 2 credits; 2 studio periods of three hours each.

506. **WATER COLOR RENDERING.** A continuation of course 505, followed by full color drawings of buildings and their surroundings. Later in the semester opportunity is given for out-of-door sketching in color. During the summer which follows, students are encouraged to make sketches for criticism.

Degree course in Architecture; sophomore year; second semester; 2 credits; 2 studio periods of three hours each.

522. **HISTORIC ORNAMENT.** The course covers the history of ornament and explains its development and the characteristics of the different important styles. The use of color in decoration is also discussed. Short lectures are given and the student is required to render three problems in the design of ornament.

Degree course in Architecture; junior year; second semester; 2 credits; 3 studio periods of two hours each.

525. **LIFE.** This course is an advanced course in free-hand drawing. The work consists of drawing from the figure, time sketching, and the essentials of figure composition.

Course in Architecture; senior year; first semester; 2 credits; 3 studio periods of two hours each.

526. **INTERIOR DESIGN AND COLOR.** The object of this course is to give the student a knowledge of the design of interiors—fire-places, the built-in parts of living rooms and dining rooms, paneling, etc., and to acquaint him with appropriate color schemes for interiors.

Course in Architecture; senior year; second semester; 2 credits; 2 studio periods of three hours each.

600. **METAL WORK.** The first semester will be given to work in jewelry-making, using copper and silver, and covering the processes of sawing, hard and soft soldering, stone setting, etching, repousse, and cuttle bone casting.

Prerequisites: Courses 102, 103, or their equivalent.

Elective; the degree course in Home Economics; or any student having the desired prerequisites; 2 credits; 3 studio periods of two hours each.

Deposit for tools, \$2.00.

601. METAL WORK. A continuation of course 600, with the addition of some work in pounding metal.

Prerequisites: Courses 102, 103.

Elective; the degree course in Home Economics; or any student having the desired prerequisites; senior year; second semester; 2 credits; 3 studio periods of two hours each.

Deposit for tools, \$2.00.

ARCHITECTURE

The courses in Architecture are prescribed in such a manner as to train the student to do practical work in the design and construction of buildings. In order to permit him to follow the trend of his natural ability in this line, both general architecture and architectural engineering are offered. The courses are liberal, cultural, and scientific. The work extends over a period of four years, the first two being devoted more to liberal subjects than to Architecture, while the last two years are devoted to professional training almost exclusively.

In order to meet the demands of the day upon the practicing architect, rural or domestic architecture receives a large amount of attention; and problems in the planning of residences, schools, and churches are given to the student. Country homes and farm establishments are also considered. However, the principles of design and construction, and the art of expression, are the essentials which the student is required to grasp.

501. ARCHITECTURAL DRAWING. In this course the student is taught the use of the drawing board, T-square, triangle, and instruments. One plate each week will be prepared for the purpose of practice in lettering, line drawing, and scale. Much attention will be given to neatness and to correct presentation. The textbook will be Architectural Drawing and Lettering by Bournean Holst-Brown.

Freshman year; first semester; 3 credits; 3 draughting room periods of three hours each.

502. **ORDERS OF ARCHITECTURE.** This is a continuation of course 501, in which the proportions of the Classic orders of architecture are studied. Diluted ink drawings rendered in water color on Whatman hot pressed paper will be presented. The textbook will be the American Viguola, Part I.

Freshman year; second semester; 3 credits; 3 draughting room periods of three hours each.

507. **WOOD CONSTRUCTION.** This course is carried on in conjunction with course 510 and has one recitation each week, using Kidders Building Construction, Part II, Carpentry, as a textbook. Scale drawings, showing the construction of wooden buildings, designed by the student will be presented periodically. The properties of wood, methods of construction, and use of building materials will be carefully studied.

Sophomore year; first semester; 2 credits; 1 recitation; 1 draughting room period.

508. **MASONRY CONSTRUCTION.** This course will be studied similarly to course 507 and in conjunction with course 511, using Kidders Building Construction, Part I, Masonry, as a textbook.

509. **SHADES AND SHADOWS.** Although shades and shadows are studied in connection with the Orders, advanced work is given using as a textbook McGoodwins Shades and Shadows.

Sophomore year; first semester; 1 credit; 1 draughting room period.

510. **RURAL ARCHITECTURE.** In this course original work in design is first offered. Problems such as bungalows, houses, and schools will be given the student for solution. Only frame buildings will be studied, and the drawings will be presented as sketches, except the structural drawings for course 507, which will be practical working drawings.

Sophomore year; first semester; 3 credits; 3 draughting room periods.

511. **RURAL ARCHITECTURE.** A continuation of course 510 in which buildings of masonry are studied. Drawings will be presented formally, the design and construction being original.

Sophomore year; second semester; 3 credits; 3 draughting room periods.

521. CERAMIC ART. A study of tile, brick and terra cotta from both the scientific and artistic standpoint. The work will be taken up in class room and laboratory and will include history, design, and methods pertaining to ceramics.

Elective; junior year; first semester; 2 credits.

523. SENIOR ARCHITECTURAL DESIGN. This course is given similarly to junior Design, but the problems are more advanced.

Senior year; first semester; 10 credits; 10 draughting room periods.

524. SENIOR ARCHITECTURAL DESIGN. A continuation of course 523, including a Thesis Design.

Senior year; second semester; 10 credits; 10 draughting room periods.

527. ARCHITECTURAL APPLIANCES. The student in architecture should know something of plumbing and drainage, heating and ventilating, lighting, and many other appliances. Special lectures are given in this course by trained engineers for the purpose of showing the application of these necessities to architectural work.

Senior year; first semester; 2 credits; 2 recitation periods.

528. PROFESSIONAL PRACTICE. In this course business etiquette, customs, competitions, and many other phases of professional practice are studied.

Senior year; second semester; 2 credits; 2 recitation periods.

529. REINFORCED CONCRETE DESIGN. A study of the methods employed in the design and construction of reinforced concrete buildings. Every known system receives due consideration. Original work will be required of the student.

Senior year; first semester; 6 credits; 6 draughting room periods.

530. STEEL DESIGN. Structural steel as used in buildings is studied in this course, and the student will be required to present original solutions of problems involving steel construction.

Senior year; second semester; 6 credits; 6 draughting room periods.

531. ESTIMATES AND SUPERINTENDENCE. This course aims to present the problems encountered by the building inspector, superintendent, and contractor. Costs of labor and materials, comparisons of methods, and personal superintendence are studied.

Senior year; first semester; 2 credits; 2 recitation periods.

532. ESTIMATES AND SUPERINTENDENCE. A continuation of course 531.

Senior year; second semester; 2 credits; 2 recitation periods.

533. AGRICULTURAL BUILDING DESIGN. This course is primarily for students of agriculture. Methods of framing, costs of materials, and finish of parts, also design of buildings for the farm are studied.

Elective; first semester; 1 credit; 1 draughting room period of three hours.

534. AGRICULTURAL BUILDING DESIGN. A continuation of course 533.

Second semester; 1 credit; 1 draughting room period of three hours.

CHEMISTRY

PROFESSOR FULTON

ASSOCIATE PROFESSOR TARTAR

ASSOCIATE PROFESSOR BRODIE

ASSISTANT PROFESSOR DAUGHTERS

MISS MILLER

MR. DUTCHER

MR. SEELEY

MR. JORDAN

The beginner's courses, Chemistry 100, 101, and 102, consist essentially of the proof of some of the well-known chemical laws, such as the law of conservation of matter, the law of definite proportions and of multiple proportions, the Law of Boyle, and the Law of Charles. The student attains skill in the manipulation of apparatus, and in the management of equipment in general. From this elementary work he proceeds to qualitative analysis, in the study of which he is taught to separate and identify the different elements composing the mass, and, in the case of metals, to learn of their properties, their use, the different methods of obtaining them from their ores, and the combinations in which they occur in nature.

If he has shown suitable proficiency, he advances to quantitative analysis, which is the determination of the amounts of the ingredients. He is taught both methods of analysis, volumetric, or the method by solution, and the gravimetric, or the method by precipitation and weighing. On completing these courses, the student is fairly well prepared to take up advanced chemistry, which treats of the analysis of soils, manures, cattle foods, dairy products, etc., or he can take up the subject from the inorganic side in the analysis of minerals, fuels, oils, gas, etc., or he can view it from the pharmacist's standpoint, in analyzing drugs.

The following courses are offered:

A. CHEMISTRY. This course is designed primarily for students taking the course in Mechanic Arts. It does not pretend to be a complete course in theoretical chemistry; it is to assist in familiarizing the student with the changes that take place when metals come in contact with such materials as sulphur, oxygen,

acids, water, etc. A certain amount of instruction is given in the non-metals, such as stated, in the properties of matter, common elements, and compounds; chemical equivalents and atomic weights; ionization; solution; electrolysis; carbon and its compounds; reduction; combustion; etc.; but all instruction will be mainly practical in character. No previous knowledge of chemistry is required for this course. A good high school course in physics, however, would be of great assistance in this course, and a thorough understanding of ratio and proportion is essential. Text, Stansbie's Introduction to Chemistry for Technical Students, or Smith's Elementary Chemistry.

Second year; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

B. CHEMISTRY. A continuation of course A.

Second semester; 3 credits; 2 recitations; 2 laboratory periods.

10. GENERAL CHEMISTRY. This course deals with the general principles of the science, and extends through the divisions known as the non-metals. It is offered to students who have had no previous training in chemistry. It consists of lectures, recitations, and laboratory work.

Three credits.

11. GENERAL CHEMISTRY. A continuation of course 10.

Three credits.

If it be found advisable to divide the time into one lecture, two recitations, and two laboratory periods of two hours each, so far as courses 10 and 11 are concerned, all students registered for them will be required to arrange their schedules accordingly.

100. GENERAL CHEMISTRY. This course is arranged for students who have completed high school chemistry.

Freshman year; first semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

101. GENERAL CHEMISTRY. A continuation of course 100.

Freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

General Chemistry is required for all degree courses except Commerce.

102. GENERAL CHEMISTRY. This course is arranged especially for the students of the School of Home Economics.

Freshman year; first semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

103. GENERAL CHEMISTRY. A continuation of 102.

Freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

104. CHEMICAL CALCULATIONS. A course in the mathematics of chemistry; offered to those who intend teaching the subject, and required of all laboratory assistants.

Elective; first or second semester; 2 credits; 2 recitations.

200. ELEMENTARY ORGANIC CHEMISTRY. A brief course in Organic Chemistry, and is provided for the students of Home Economics.

Sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

201. ORGANIC CHEMISTRY. This course consists of the study of the more typical and simple organic compounds and is designed for Pharmacy, and such students of Agriculture as desire to take up Physiological Chemistry and Veterinary Medicine.

Sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

202. ADVANCED ORGANIC CHEMISTRY. A course designed for those who desire to extend their information beyond that possible with 200 or 201.

Elective; second semester; 3 credits.

300. QUALITATIVE ANALYSIS. This course consists largely of laboratory practice in the ordinary processes of separating and identifying ions.

The course in Pharmacy; sophomore year; first semester; 3 credits; 1 recitation; 3 laboratory periods.

301. QUALITATIVE ANALYSIS. A course provided for Mining students.

Mining students; sophomore year; first semester; 5 credits; 5 laboratory periods of three hours each.

302. QUALITATIVE ANALYSIS. Students in Highway Engineering.

Three credits; 1 recitation; 3 laboratory periods of two hours each.

303. ORGANIC QUALITATIVE ANALYSIS. A course for Pharmacy students.

Elective; second semester; 3 credits; 3 recitations; 2 laboratory periods.

304. FOOD AND DRUG ANALYSIS. Pharmacy students.

Prerequisites: Organic Chemistry and Botany.

Elective; junior year; 3 credits.

400. QUANTITATIVE ANALYSIS. A course designed for students in Pharmacy, and consists of instruction in both gravimetric and volumetric analysis of pharmaceutical products.

Junior year; first semester; 3 credits.

401. QUANTITATIVE ANALYSIS. This is a course in analysis for Mining students, and consists of gravimetric analysis of limestones, iron, lead, zinc, arsenic and antimony ores, coal, and as much other work as time will permit.

The course in Mining Engineering; sophomore year; second semester; 5 credits; 5 laboratory periods.

402. CHEMISTRY OF FOODS. An advanced course for the students of Home Economics, consisting of practice in the best methods as applied in food analysis, and in detection of common adulterants. Opportunities for research work will be given if desired.

Four credits.

403. CHEMISTRY OF WATER. This course is designed especially for the students in Highway Engineering, and consists of the examination, both physically and chemically, of waters for domestic purposes, such as well waters, but more particularly that supplied to cities, whether under municipal control or that of private corporations. At the close of the chemical examinations, bacteriological tests will be made under the auspices of the department of Bacteriology.

Prerequisites: Chemistry 100 and 101.

The course in Highway Engineering; junior year; second semester; 2 credits; 2 laboratory periods.

404. PHARMACEUTICAL ANALYSIS. This is an extension of Quantitative Analysis 400, and consists of the chemical examination of alkaloidal drugs and galenicals, and of the examination of urine.

The course in Pharmacy; junior year; second semester; 4 credits; 4 laboratory periods.

405. **CHEMISTRY OF HIGHWAY MATERIALS.** The course is designed for students in Highway Engineering, and consists of the study of such materials as cement, asphalt, bitumen, mineral oils, tar, and tar products.

The course in Highway Engineering; junior year; second semester; 2 credits; 2 laboratory periods.

406. **ELECTRO-CHEMISTRY.** This is a course for advanced Mining students, and consists of the application of the electric current to solutions of the different metals in metallurgical analysis.

Senior year; first semester; 3 credits; 1 lecture; 2 laboratory periods.

407. **CHEMISTRY FOR ENGINEERS.** This course is particularly for students in Mechanical and Electrical Engineering. It consists of the analysis of coal, oil, gas, and of their calorific powers; also the technical analysis of flue gases.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods.

409. **PHYSIOLOGICAL CHEMISTRY.** This course is primarily for students in Pharmacy, but is open to any one interested in the subject.

Prerequisite: Chemistry 200.

Junior year; second semester; 4 credits; 4 laboratory periods.

410. **ELEMENTARY PHYSICAL CHEMISTRY.** This course is particularly for students in Chemical Engineering, and consists of the study of the molecular weight of gases; chemical equilibrium; electro-chemistry.

Junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods of three hours each.

411. **THERMOCHEMISTRY.** A course for the students in Chemical Engineering; consists of thermochemical measurements; heat of formation; heat of combustion; relation of chemical affinity to heat of reaction, etc.

Junior year; 3 credits; 1 lecture; 2 laboratory periods.

412. **METALLURGICAL ANALYSIS.** This consists of the analysis of Metallurgical and Engineering materials, such as limestone, cement, coal, iron ore, copper matte, brass, bronze, steel, babbitt metal, water, oil, etc.

The course in Chemical Engineering; junior year; first semester; 3 credits; 3 laboratory periods.

413. **CHEMICAL TECHNOLOGY.** A course of lectures in the principles of Organic, Analytical, and Technical Chemistry as applied to those industries depending upon chemistry as a basis for their processes.

The course in Chemical Engineering; senior year; first semester; 2 credits. A continuous course: credit will not be awarded until the second semester's work has been completed.

414. **CHEMICAL TECHNOLOGY.** A continuation of course 413.

The course in Chemical Engineering; senior year; second semester; 2 credits.

500. **AGRICULTURAL CHEMISTRY.** A course consisting of lectures, recitations, and laboratory work, dealing with the more important phases of Chemistry as related to Agriculture.

The course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

501. **AGRICULTURAL CHEMISTRY.** A continuation of course 500.

The course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

502. **DAIRY CHEMISTRY.** The study of the chemistry of milk and its products, including both qualitative and quantitative determination of adulterants and preservatives.

Prerequisites: Chemistry 201 and 500.

The course in Dairy Husbandry; junior year; second semester; 3 credits; 3 laboratory periods.

503. **SOIL CHEMISTRY.** This is a lecture and laboratory course on the methods of soil analysis, as used by the different experiment stations.

Prerequisites: Chemistry 201 and 500.

Junior year; first semester; 2 or 4 credits; 2 or 4 laboratory periods.

504. **SOIL CHEMISTRY.** A continuation of course 503.

Junior year; second semester; 2 or 4 credits; 2 or 4 laboratory periods.

505. **AGRICULTURAL ANALYSIS.** A course in analytical methods applied to agricultural materials, including cereals, fertilizers, soil, water, etc.

Prerequisites: Chemistry 201 and 500.

Junior year; first semester; 2 to 4 credits; 4 laboratory periods.

506. **AGRICULTURAL ANALYSIS.** A continuation of course 505.

Junior year; second semester; 2 to 4 credits; 4 laboratory periods.

507. ADVANCED AGRICULTURAL ANALYSIS. This course is especially thesis work in the Experiment Station laboratory, or work of the same general description.

Senior year; first semester; 4 credits; 4 laboratory periods

508. ADVANCED AGRICULTURAL ANALYSIS. A continuation of course 507.

Senior year; second semester; 4 credits; 4 laboratory periods.

509. ANIMAL CHEMISTRY. A study of the composition of the animal body and products of the animal body, such as milk, wool, etc. Special emphasis is placed on the chemistry of the fats, proteins, and carbohydrates. Enzyme action, digestion of foodstuffs, their absorption and distribution, fate of the foodstuffs in metabolism, metabolic products and their excretion, will be considered. Recent publications bearing on animal nutrition will be read and discussed.

Junior year; first semester; 2 credits; 2 lectures.

510. PLANT CHEMISTRY. Designed for students desiring a fuller consideration of the growth and composition of plants; properties, nature, and classification of plant constituents; chemical analysis; chemical synthesis; enzymes; chemistry of the manufacture of plant products, etc.

Second semester; 2 credits; 2 lectures.

ENGLISH LANGUAGE AND LITERATURE

PROFESSOR BERCHTOLD
ASSISTANT PROFESSOR CALLAHAN
ASSISTANT PROFESSOR PETERSON
MR. BALDWIN
MRS. McELFRESH
MISS VANCE
MISS ROSAEN

It is the aim of this department to teach the student to express with clearness what he thinks with vigor. He is taught that the essential part of any composition, whether oral or written, is thought, well organized and well expressed; that to comprehend clearly and to feel strongly what he has to say are the indispensable conditions of making others comprehend and feel it.

What his textbook helps him to do consciously, familiarity with superior writers should help him to do unconsciously; for we may get good from a master of English by unconscious absorption, just as we acquire good manners by associating with gentlemen and ladies. No mind can fail to be stimulated by contact with greater minds, whether living or dead. Their pages feed the powers of thought and strengthen the power of expression, thus enabling the student to think, talk, and write to more purpose.

In all the collegiate courses in English the work is correlated with that offered in the other departments, to bring it into harmony with the trend or spirit of the institution, which is distinctly technical and industrial in character. Subjects are assigned for presentation and discussion which bear close relation to the work pursued by the students in the different schools, in anticipation of their probable needs and activities in later life. What is sought and insisted on is, earnest, logical, forceful presentation of facts that will compel attention and carry conviction.

The Oregon Agricultural College participates in a number of intercollegiate oratorical contests and debates; and the department offers elective courses in public speaking, designed to give preparation for these contests.

A—RHETORIC AND LITERATURE

A. ELEMENTARY CONSTRUCTIVE ENGLISH AND LITERATURE. This course is designed, first, to make expression of ideas a pleasure to the student. It is not confined to the mere memorizing of inflections and the formulation of rules. The course consists of both oral and written work. Written exercises prepared under rules of form are required constantly to obtain flexibility and confidence in expression. There is daily drill in punctuation and capitalization, in analysis and synthesis of sentences. Special emphasis is laid upon spelling. Practice in the correction of written work is given to enable the student to detect his own mistakes readily. Elementary themes, one, two, and three paragraphs in length, are required, the subjects being chosen from the student's experience, and from classic readings. Ten short themes, with conferences for criticism, will be required.

The course is designed, second, to cultivate in the student a taste for reading; to assist him in the interpretation of the simpler classics of our literature; and to encourage him to express his own thoughts clearly and without embarrassment. Masterpieces of prose and poetry are studied, and some collateral reading is required. Oral and written reports on current events as outlined in the Literary Digest, the Atlantic Monthly, and other standard magazines. Special attention is given to—

“The Odyssey,” Lang’s translation.

“Snowbound,” Whittier.

The Vocational courses; first year; first semester; 3 credits; 3 recitations.

B. COMPOSITION AND LITERATURE. The aim of this course is to ground students thoroughly in the elements and fundamentals of composition, and to continue the work in elements of literature. Capitalization and punctuation reviewed; the importance of letter writing emphasized; principles governing sentence structure, paragraph structure, and theme structure, studied, with certain classic models always in the foreground; the aim is, in short, to develop power of expression and individuality as spontaneously and naturally as possible. Further, the logical arrangement of thoughts as

represented by the outline, receives special emphasis. At least eight short themes, six long themes, synopses, and one resume, with conferences for criticism to illustrate the forms of composition.

The following classics will be studied:

"The Iliad," Lang's translation.

"The Pilgrim's Progress," Part I, Bunyan.

"The Merchant of Venice," Shakespeare.

"The Vision of Sir Launfal," Lowell, or "The Ancient Mariner," Coleridge.

The Vocational courses; first year; second semester; 3 credits; 3 recitations.

C. ADVANCED COMPOSITION AND LITERATURE. Open to students who have had courses A, B, or their equivalent.

A review of the principles of grammar; exercises in syntactical construction; principles governing the structure of the whole composition; analysis and outline of specimens of easy classic prose and poetry, with a view to illustrating theme structure; writing of short compositions in class on "read up" matter; and the preparation of twelve short themes and two long themes, in the narrative and descriptive forms, with attention to sentence structure, spelling, punctuation, and paragraph arrangement.

Principles of literary criticism; interpretative study of classics; analysis and rendering. George Eliot's "Silas Marner," Irving's "Tales of a Traveller," Parkman's "Montcalm and Wolfe," or Dickens' "Tale of Two Cities," constitute the list of classics from which selections for study will be made.

The Vocational courses; second year; first semester; 3 credits; 3 recitations.

D. ADVANCED COMPOSITION AND LITERATURE. A continuation of course C. Intensive study of the Paragraph, the Sentence, and the Word; study of synonyms; paragraph writing, with a view to applying the principles governing the development of the topic statement; at least ten short themes, occurring weekly, and three long themes, in the expository and argumentative forms.

Continuation of the methods of work employed in the first semester. A selection of two classics will be made for study from a list consisting of Shakespeare's "As You Like It," Mary Johnston's "The Long Roll," Hawthorne's "The House of Seven Gables."

The Vocational courses; second year; second semester; 3 credits; 3 recitations.

M. BUSINESS ENGLISH. Besides giving a thorough training in the various forms of commercial correspondence, the course aims to ground the student in the vocabulary, forms, and usages peculiar to business and administrative pursuits. There is constant and persistent practice in spelling and punctuation, in composition and letter writing, with a view to imparting to the student's English strength and virility, and to enable him to achieve results.

Two-year Business course; second year; course in Pharmacy; sophomore year; first semester; 3 credits; 3 recitations.

N. TECHNICAL ENGLISH. A continuation of course M. Advanced composition and letter writing; business forms, incidental writing; summaries; advertising; preparation of copy and proof-reading. Good, clear, effective English is at all times insisted upon.

Two-year Business course; second year; second semester; 3 credits; 3 recitations.

31. COLLEGE RHETORIC. A rapid survey comprehending the work done by the high school in literature, rhetoric, and composition, and involving the preparation of several short essays, with a view to ascertaining the extent of the student's literary appreciation and command of rhetorical principles. Lectures, assignments, and recitations upon the methods of effective discourse. Lectures upon the intellectual and emotional types of expression, with practical exercises in discriminating these types and their variants. Studies in the expository and argumentative methods of writing, with analysis of specimens. Draughting of expository outlines with special attention given to obtaining correctness in coordination and subordination. The paragraph considered as a distinct stage in expository composition; practice writing to exemplify the various methods of developing the topic statement. Plotting of simple briefs, and writing of easy forensics. At every stage of study selections from standard and contemporary authors will be read and discussed, in order that the student may acquire ability to master content, differentiate literary types, and appreciate standards of excellence. Subjects of composition will be those suggested by the student's personal, school, literary, community, and vocational interests, oral composition supplementing written.

Compositions required: five expository and three argumentative short themes; one expository long theme requiring research and accompanied by outline and bibliography; one resume and one criticism; one argumentative long theme, accompanied by brief. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that he writes in other departments.

Courses in Home Economics and Industrial Arts; freshman year; first semester; 3 credits; 3 recitations.

32. ADVANCED COLLEGE RHETORIC. Study of the elements and principles involved in effective discourse, continued. Lectures on the characteristics of the literature of feeling, with a rendering of selections for illustration. Discussion of the narrative and descriptive methods of writing. Expository and emotional description differentiated. Examination of the narrative principle in epic forms, in ballad literature, in the incidents occurring in the drama, in the news letter, and in anecdote. Studies and practice writing in the narrative paragraph and in dialogue. Analysis of two or three of the briefer and less complex short stories of standard authors, for the purpose of gaining an appreciation of the form and function of the short story type.

Compositions required: five short descriptive themes; four short narrative themes; one long narrative; one long theme retelling in abstract the story of a book of fiction; one criticism of a short story. Frequent oral delivery.

Courses in Home Economics and Industrial Arts; freshman year; second semester; 3 credits; 3 recitations.

51. THE ENGLISH ESSAY AND NOVEL. Study of structure of novel and essay. Study of essay and novel as expressions of national life and thought. Emphasizing the growth of the economic, critical, historical, and personal essay, and the larger categories of fiction; the novel of manners, of character; the problem novel and the romantic novel. Class and individual assignments, lectures, and reports.

Course in Home Economics; sophomore year; first semester; 3 credits; 3 recitations.

52. THE ENGLISH DRAMA. Study of the Elizabethan and the Stuart drama; the modern drama. A survey of the rise and devel-

opment of the tragedy, comedy, and historical play. Study of setting, plot, structure, and characters. Reading of plays in class; reports on assigned readings.

Course in Home Economics; sophomore year; second semester; 3 credits; 3 recitations.

61. THE HISTORY OF ENGLISH LITERATURE. A general outline course of the history of English literature. This includes a survey of the principal forms of literature as exemplified by the masters in each field. The aim is to cultivate an appreciation of what is excellent in quality and form. Masterpieces representing the best thought and form are studied in class or assigned to students for careful reading and reports. Chief attention given to Chaucer, Spenser, Shakespeare, Milton, Swift, Poe, Johnson, Burke, Goldsmith, and Burns.

Elective in all courses; first semester; 3 credits; 3 recitations.

62. THE HISTORY OF ENGLISH LITERATURE. A continuation of course 61. A study of the master minds of the nineteenth century. Wordsworth, Scott, Shelley, Keats, Macauley, Dickens, Thackeray, George Eliot, Matthew Arnold, Carlyle, Ruskin, Stevenson, and others. Lectures, reading, and discussions; critical reports on assigned topics required from all the students.

Elective in all courses; second semester; 3 credits; 3 recitations.

71. AMERICAN LITERATURE. A study of the growth and development of literature in our country. Particular emphasis is placed on the study of writers of the nineteenth century, including such authors as Irving, Cooper, Bryant, Poe, Hawthorne, Longfellow, Holmes, and Lowell, as well as to prominent writers of the present day. Lectures; class study; class reading; reports on assigned topics; essay.

Elective in all courses; senior year; first semester; 3 credits; 3 recitations.

72. AMERICAN LITERATURE. A continuation of course 71. The metropolitan writers; literature in the South; literature in the West; present schools and tendencies; periodical literature. Lectures; class room work; reports; essays.

Elective in all courses; senior year; second semester; 3 credits; 3 recitations.

81. MODERN ENGLISH PROSE. A study of representative modern prose writers, with special reference to prose as found in

present day standard periodicals. Study of the newspaper paragraph. Practice in reporting lectures. Exercises in the elaboration of field notes. Drills looking to the popularization of technical matters and the results of experiments. Writing of papers and reports. Theme writing. Oral composition.

The courses in Agriculture, Forestry, Logging Engineering, Mechanical Engineering, Highway and Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy.

Freshman year; first semester; 3 credits; 3 recitations.

82. MODERN ENGLISH PROSE. A continuation of course 81.

The courses in Agriculture, Forestry, Logging Engineering, Mechanical Engineering, Highway and Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy.

Freshman year; second semester 3 credits; 3 recitations.

107. SPECIAL COMPOSITION. If a student, in his work in any department, submits papers notably deficient in English, he may be required, at any time after his freshman year, to take course 107. It consists wholly of theme work and consultations, and is continued in each case as long as the needs of the student require.

Sophomore, junior, or senior year; first and second semesters; 2 credits; 2 recitations.

B—PUBLIC SPEAKING

103. COMPOSITION OF ADDRESSES. This course deals with the composition of the most important kinds of addresses, including the argument, the eulogy, the commemorative address, and various forms of non-forensics. The work consists of lectures, a study of textbooks, analysis of masterpieces, practice in the composition of the various forms, and frequent class room exercises.

Course in Pharmacy; elective in all other courses; junior year; first semester; 2 credits; 2 recitations.

104. COMPOSITION OF ADDRESSES. Continuation of course 103.

Course in Pharmacy; elective in all other courses; junior year; second semester; 2 credits; 2 recitations.

108. ORATORY. This course is intended as special preparation for those who wish to enter oratorical work. The work consists of lectures on the theory of oratory, the preparation of original orations, class room exercises, and personal conference and criticism. The course can be taken only with the consent of the instructor.

Elective in all courses; first semester; 1 credit; 1 recitation.

109. ORATORY. A continuation of course 108.

Second semester; 1 credit; 1 recitation.

141. TECHNICAL ENGLISH. The writing which the engineer has to do is almost wholly of the nature of exposition. Indeed, is only in so far as it is expository that it offers any problem different from those which arise in general composition. In technical English, then, in the engineering courses, attention is centered on exposition of the various types which the engineer has to use, in description, in narration, in directions, in criticism, and in argumentation.

Textbook: Earle's Theory and Practice of Technical English for Engineers.

At all times it will be insisted on that whatever facts the student expresses, shall be expressed accurately; that the treatment of the subject shall be complete for the purpose in hand; that the form of presentation shall be logical; and that the expression shall be economical for the reader.

Required in the course in Mining; elective in all other engineering courses; senior year; first semester; 3 credits; 3 recitations.

142. TECHNICAL ENGLISH. Study of advanced technical composition. Special attention is given to letters of application, letters of inquiry and information, circular letters, letters of complaint, sales letters, follow-up letters, and collection letters. The ability to write a clear, forceful, effective letter has become a first requisite, not only for business success, but for intellectual and social recognition.

The course in Commerce; sophomore year; first semester; 3 credits; 3 recitations.

191. STORY-TELLING. The study of children's literature, and the analysis and reproduction of short stories suitable for the primary grades, the kindergarten, and the nursery.

Elective in the course in Home Economics; senior year; first semester; 1 credit; 1 recitation.

192. STORY-TELLING. A continuation of course 191.

Elective in the course in Home Economics; senior year; second semester; 1 credit; 1 recitation.

201. ELOCUTION. Literary interpretation, including analysis, memorizing, and rendering of selected masterpieces of prose and

poetry. The aim of this course is to enable the student not only to understand and appreciate the thought and spirit of literature, but to render it naturally and effectively; to correct erroneous habits of speech, and to give freedom, purity, and strength of tone; to cultivate the power of expression through imagination; to eliminate artificiality, affectation, and self-consciousness.

Elective; first semester; 2 credits; 2 recitations.

202. ELOCUTION. Continuation of course 201.

Elective; second semester; 2 credits; 2 recitations.

203. ELOCUTION. Advanced literary interpretation. Training in the delivery of masterpieces of prose and poetry. Interpretative study of Shakespeare and the modern drama; presentation of scenes from plays; bodily expression; impersonation.

Prerequisites: Courses 201 and 202.

Elective; first semester; 2 credits; 2 recitations.

204. ELOCUTION. Continuation of course 203.

Elective; second semester; 2 credits; 2 recitations.

301. JOURNALISM. Opportunity for valuable practice in writing for publication is afforded by the existence at the Oregon Agricultural College of a large number of technical and scientific publications, besides those of general interest. The list of publications includes: the Barometer, general student paper, published twice a week; the Oregon Countryman, monthly agricultural-domestic science publication; the Student Engineer, published by the students of the Engineering and Forestry courses; the Commerce-Pharmacy Journal, published by the students of Commerce and Pharmacy; and the Orange, the junior annual.

Training is given not only through the guidance of the instructors in the technical specialties about which the student decides to write, but through the cooperation of Professors E. W. Allen and W. V. Dymont, of the department of Journalism of the University of Oregon, Eugene. These professors make weekly visits to the college to advise with the students writing for the College publications, and to conduct a regular series of practical talks and recitations, constituting a college course.

Elective; first semester; 1 credit; 1 recitation.

302. JOURNALISM. A continuation of course 301.

Elective; second semester; 1 credit; 1 recitation.

HISTORY

PROFESSOR HORNER

D. UNITED STATES HISTORY. With special attention to the colonial, political, and industrial aspects. A brief course that covers the leading events of our history. Particularly important in Oregon since the introduction of direct legislation and equal suffrage.

Two-year Business course; first year; first semester; 3 credits; 3 recitations.

30. EUROPEAN HISTORY. Course 30 includes the study of Europe at the time of Louis XIV; reconstruction of Europe at Utrecht; Russia and Prussia become European powers; Wars of Frederick the Great; Struggle between France and England for India; Rivalry of France and England in North America; The Old Regime in Europe; The Spirit of Reform; Enlightened Despots of the Eighteenth Century; The French Revolution; The First French Republic; Europe and Napoleon; The Reconstruction of Europe at the Congress of Vienna.

Elective; first semester; 3 credits; 3 recitations.

40. MODERN EUROPE. This course comprises a study of the following subjects: Europe after the Congress of Vienna; The Industrial Revolution; Revolution of 1848; Unification of Italy; Formation of the German Empire and the Austria-Hungarian Union; The German Empire; France under the Third Republic; Social and Political Reforms in England; British Empire in the Nineteenth Century; Russian Empire in the Nineteenth Century; Turkey and the Eastern Question; The Expansion of Europe in the Nineteenth Century; Some of the great problems of today.

The course in Commerce; sophomore year; second semester; 3 credits; 3 recitations.

52. HISTORY OF THE BRITISH EMPIRE. A coherent view of the larger factors influencing national development from the earliest times to the British Empire of today. Social, economic, artistic, and intellectual growth is broadly surveyed, and is made to reveal a picture of the changing conditions of the people rather than that of the king and nobility. Legal and constitutional development is

also emphasized by tracing the origin and development of English common law and by discussing the nature and importance of the great statutes. Particular attention is given to such subjects as the Industrial Revolution, Growth of the Power of the House of Commons, the Extension of the Franchise, Remedial Legislation, and Colonial and Imperial Development.

Elective; senior year; first semester; 3 credits; 3 recitations.

62. CONTEMPORARY AMERICAN HISTORY (1877-1914). The history of the United States from the Reconstruction Period to the inauguration of President Wilson. Such matters as the negro question, the industrial revolution, capitalism and socialism, free silver, direct government, woman suffrage, the growth of judicial review, the new nationalism, imperialism, the labor movement, the progressive movement, the Panama-Colombia question, present status of the Monroe Doctrine, and our relation with the Latin-American republics, are discussed from the standpoint of history.

The course in Commerce; freshman year; second semester; 3 credits; 3 recitations.

70. HISTORY OF OREGON. Early explorations. Lewis and Clark expedition. Minor expeditions. Fur trade. Rivalry between companies. Era of immigration. Oregon organized under Hudson Bay Company. Agitation in Congress for military occupation of the Columbia. The Nez Perce Indians ask for the Bible. Response by Methodists and Congregationalists. Doctor Whitman and the Oregon movement. Struggle for the Willamette. Struggle for the Columbia. First transcontinental wagon road. Provisional government. Progress of immigration and missions. Gold excitement. Subdivision of Oregon into territories. Indian wars. Home building. Disposition made of the Indians. Oregon becomes a state. Introduction of improved fruit, grains, and stock. Ships and railways. Select schools, public schools, and higher education. Oregon literature. Industrial training, and introduction of scientific methods. Irrigation; conservation of forests. "The Oregon System" of direct legislation.

The course in Commerce; sophomore year; first semester; 3 credits; 3 recitations.

80. AMERICAN DIPLOMATIC HISTORY. This course deals with the history of the chief events in American foreign affairs from

the beginning of the government to the present time. Its purpose is to show the policies of our government on the same subject at different times, the causes for the changed policies, and the methods employed to work out the policies. An attempt is made to show the changed attitude of governments in their dealings with each other in the course of our national history. Throughout the course considerable attention will be given to character studies of the men leading in our diplomatic work. The ultimate aim is the application of our experience to present problems.

Elective; senior year; second semester; 3 credits; 3 recitations.

90. GREECE AND ROME. Advanced course.

Elective; second semester; 3 credits; 3 recitations.

LIBRARY

MRS. KIDDER
MISS LEWIS
MISS GEORGE
MISS HAIGHT
MISS DOBELL
MR. ROACH
MISS HOUT

EQUIPMENT. The Library occupies the second floor of the Administration building. The reading and general reference room is large, well lighted, and extends entirely across the building. It is supplied with about five hundred leading magazines and newspapers. Through the courtesy of the editors, a large number of farm, orchard, stock, and home journals, and country newspapers of Oregon are received regularly at the reading room. The book stacks, occupying adjacent rooms, contain about 20,000 volumes of standard works of history, biography, engineering, agriculture, natural science, general literature and reference, and about 5,000 reports and other publications from the Agricultural Colleges and Experiment Stations of all the states, and 30,000 bulletins and pamphlets. The library is a designated depository of United States Government publications, of which it has about 7,000 volumes. Over 2,000 of these were received as a gift from the library of the late United States Senator Dolph.

Practical use of the books has led to the establishment of small laboratory collections kept in the rooms of the following departments: General Chemistry, Agricultural Chemistry, Animal Husbandry, Agronomy, Horticulture, Botany, Forestry, Bacteriology, Zoology, Pharmacy, Civil, Mechanical, Electrical, and Mining Engineering. Each department library is in charge of the head of that department, to whom application must be made for the use of the books.

All books are classified and catalogued according to the Dewey decimal system. Books may be drawn for home use by all officers and students of the College. Books may be kept by the students for two weeks with the privilege of a renewal, and by officers for

any reasonable time. All students have free access to the shelves of the reference library in the reading room, but apply at the delivery desk for other works which they may desire.

The reference library consists of encyclopedias, dictionaries, standard reference books in the different departments of study, and bound periodicals, together with books designated by professors for collateral reading in the various courses of instruction. A small collection of books for cultural reading is also kept in the reading room. In the same room, and accessible to all readers, is the card catalogue of the general library, including the books of the department libraries. The catalogue includes both authors and subjects under one alphabet on the dictionary plan; there is also a card catalogue of the publications of the U. S. Department of Agriculture, and a card index to the publications of the State Experiment Stations.

1. LIBRARY PRACTICE. This course teaches, by means of lectures and practical problems, the use of catalogues, indexes, and reference books, such as dictionaries, encyclopedias, atlases, handbooks of general information, handbooks of history, statistics, quotations, etc.

All degree courses; freshman year; one semester; $\frac{1}{2}$ credit; 1 recitation.

MATHEMATICS

PROFESSOR JOHNSON
ASSISTANT PROFESSOR TARTAR
ASSISTANT PROFESSOR BEATY
MR. BEARD

A. ALGEBRA. The work of the course includes a drill in the fundamental operations, use of parentheses, special rules of multiplication and division, factoring, highest common factor, lowest common multiple, and fractions.

The Mechanics Arts course; first year; first semester; 5 credits; 5 recitations.

B. ALGEBRA. The topics studied are solution of fractional and literal equations, problems involving linear equations, simultaneous linear equations, involving two or more unknown numbers, problems involving simultaneous linear equations, graphical representation, inequalities, involution, evolution, theory of exponents, radical expression, and imaginary numbers.

The Mechanic Arts course; first year; second semester; 5 credits; 5 recitations.

C. ALGEBRA. Required of freshmen who enter with but one year of Algebra.

Either semester; 3 credits; 3 recitations.

D. PLANE GEOMETRY. Course D includes the first two books of Plane Geometry. The constant aim is to develop in the student the power of logical reasoning, and of clearness and accuracy of expression. To this end, many original exercises are studied, and at all times demonstrations and proofs are freely discussed in the class room. Required of freshmen entering deficient in first semester of Plane Geometry.

First semester; 3 credits; 4 recitations.

E. PLANE AND SOLID GEOMETRY. A continuation of Course D, arranged for freshmen in Engineering who enter deficient in the second semester of Plane Geometry.

Second semester; 5 credits; 5 recitations.

F. SOLID GEOMETRY. Required of all Engineering freshmen who are deficient in Solid Geometry.

Freshman year; first semester; 2 credits; 3 recitations.

G. PLANE GEOMETRY. Courses G and H are arranged for freshmen who enter deficient in the second semester of Plane Geometry, and who desire to use both semesters to make up the condition. The two courses are equivalent to course K.

Freshman year; first semester; $1\frac{1}{2}$ credits; 2 recitations.

H. PLANE GEOMETRY. A continuation of course G.

Freshman year; second semester; $1\frac{1}{2}$ credits; 2 recitations.

K. PLANE GEOMETRY. A continuation of course D, covering the last three books of Plane Geometry. Many original exercises are studied. Required of freshmen, except those in Engineering, who enter deficient in second semester of Plane Geometry.

Second semester; 3 credits; 4 recitations.

L. PLANE GEOMETRY. A course arranged to meet the needs of students in Mechanic Arts.

The course in Mechanic Arts; second year; second semester; 4 credits; 5 recitations.

M. COMMERCIAL ARITHMETIC. A review of all the essential operations. Special stress is laid on short methods; daily drills in rapid calculation; computation of estimates; partnership settlements, etc.

The two-year Business course; first year; first semester; 3 credits; 5 recitations.

N. COMMERCIAL ARITHMETIC. A continuation of course M.

The two-year Business course; first year; second semester; 3 credits; 5 recitations.

O. SHOP ARITHMETIC. A thorough drill in the principles of arithmetic, with special application to shop problems of all sorts.

The course in Mechanic Arts; second year; first semester; 4 credits; 5 recitations.

R. FARM ARITHMETIC. An elective course for students in the one-year course in Agriculture who feel the need of a review of arithmetic. A practical text dealing with problems of the farm will be used.

The vocational course in Agriculture; second semester; 4 credits; 5 recitations.

T. GEOMETRY AND TRIGONOMETRY.

The course in Mechanic Arts; third year; first semester; 4 credits; 5 recitations.

(Not given in 1914-15.)

10. ADVANCED ARITHMETIC. An advanced course in commercial arithmetic, especially for students in the School of Commerce. To do successful work in this course, the student should have a thorough knowledge of all the fundamental operations of arithmetic, including the various phases of percentage and interest. Emphasis is laid on computations of the more difficult problems connected with partnership and corporation settlements, balance sheets and statements, equation of accounts, partial payments, savings bank accounts, compound interest, stocks and bonds, life insurance, and annuities, partly for the information obtained in the various subjects and partly for the drill afforded in the use of figures. Daily drills are given in short methods and rapid calculation.

Freshman year; first semester; 3 credits; 3 recitations.

11. PLANE TRIGONOMETRY. This course includes functions of acute angles, right angles, functions of any angle, relations between functions, inverse functions, trigonometric equations, and oblique triangles. Considerable time is devoted to the deduction of trigonometric formulæ, study of trigonometric identities, and the solution of practical problems.

All Engineering courses; freshman year; first three-fifths first semester; 3 credits; 5 recitations.

12. PLANE TRIGONOMETRY. The course in Industrial Arts; second semester; 3 credits; 3 recitations.

14. TRIGONOMETRY. A review of algebra, including logarithms, is followed by a course similar in character to 11, except that more time is given to the solution of partial problems.

The course in Forestry; freshman year; first semester; 3 credits; 4 recitations.

21. COLLEGE ALGEBRA. After a brief review of radical expressions, theory of indices, and quadratic equations, graphical representation and mathematical induction are studied.

All Engineering courses; freshman year; last two-fifths of first semester; 2 credits; 5 recitations.

31. **ELEMENTARY ANALYSIS.** Under College Algebra are treated the binomial theorem, progressions, complex numbers, and the theory of equations. In analytical geometry the point, straight line, circle, conic sections, and some of the higher plane curves are studied. Considerable time is given to the plotting of curves in both rectangular and polar co-ordinates.

All Engineering courses; freshman year; second semester; 5 credits; 5 recitations.

34. **ELEMENTARY ANALYSIS.** This course is similar to 31, but shorter. Particular emphasis is given to curve plotting in both rectangular and polar co-ordinates.

The course in Forestry; freshman year; second semester; 3 credits; 4 recitations.

41. **PLANE ANALYTIC GEOMETRY.** Course 41 is offered to students who enter the sophomore year deficient in Analytic Geometry. The topics studied are the point, the straight line, polar co-ordinates, transformation of co-ordinates, the circle, conic sections, tangents, diameter, poles and polars, discussions of general equations of the second degree, problems in loci, and higher plane curves.

All Engineering courses; sophomore year; first semester; 3 credits; 3 recitations.

51. **DIFFERENTIAL CALCULUS.** Among the subjects presented are: differentiation and applications, evaluation of indeterminate forms, expansion of functions, Taylor's and Maclaurin's theorems, maxima and minima, points of inflection, curvature, change of independent variable, functions of two or more variables, asymptotes, curve tracing, etc.

All Engineering courses; sophomore year; first semester; 4 credits; 5 recitations.

52. **INTEGRAL CALCULUS.** Among the topics considered are: direct integration, definite integrals and applications; integration by parts, integration of trigonometric forms, etc.; applications to finding the lengths and areas of curves, surfaces, and volumes of solids of revolution, etc.; double and triple integration and applications. In this course, as in Course 51, great stress is laid upon practical applications, and a large number of practical problems are solved.

All Engineering courses; sophomore year; second semester; 4 credits; 5 recitations.

61. DIFFERENTIAL EQUATIONS. A study of the solution of ordinary and partial differential equations which the Engineering student is likely to encounter.

Prerequisites: Courses 51, 52.

Elective; junior year; first semester; 3 credits; 3 recitations.

71. METHOD OF LEAST SQUARES. Prerequisites: Courses 51, 52.

Elective; junior year; second semester; 2 credits; 2 recitations.

MODERN LANGUAGES

PROFESSOR BACH

MISS KUNEY

MISS LEROUX

Courses of three years are offered in French, German, and Spanish respectively.

The end in view is practical use for the various pursuits of life. Consequently the method of teaching is thoroughly practical, combining all the theory necessary with all the practice possible.

FRENCH

101. FRENCH. Grammar; oral and written exercises; some of the irregular verbs in general use; reading of 100 to 150 pages of easy prose.

First semester; 3 credits; 3 recitations.

102. FRENCH. A continuation of course 101.

Prerequisite: Course 101.

Second semester; 3 credits; 3 recitations.

103. FRENCH. Grammar continued; irregular verbs; reading of intermediate texts; oral and written exercises.

Prerequisites: Courses 101 and 102.

First semester; 3 credits; 3 recitations.

104. FRENCH. A continuation of course 103.

Prerequisites: Courses 101, 102, 103.

Second semester; 3 credits; 3 recitations.

In addition to the regular second year's work, a special elective conversational course is offered for all students who have completed the first year's work. (See course 109.)

105. FRENCH. Science course. Reading of selections from French scientific literature.

Prerequisites: Courses 101, 102, 103, 104.

First semester; 2 credits; 2 recitations.

106. FRENCH. A continuation of course 105.

Prerequisites: Courses 101, 102, 103, 104, 105.

Second semester; 2 credits; 2 recitations.

107. FRENCH. General third year course comprising selections from the various classes of literature, together with composition and conversational exercises.

Prerequisites: Courses 101, 102, 103, 104.

108. FRENCH. A continuation of course 107.

Prerequisites: Courses 101, 102, 103, 104, 107.

Second semester; 3 credits; 3 recitations.

109. FRENCH. A conversational course. Provides interesting and profitable conversational drill on practical every-day topics and includes, in a new form, a helpful review of the elements of the language.

Prerequisites: Courses 101, 102.

110. FRENCH. A continuation of course 109.

Second semester; 1 credit; 1 recitation.

111. FRENCH. Conversational course. Provides well-graded and systematically planned talks on all sorts of topics.

Prerequisites: Courses 101, 102, 103, 104.

First semester; 1 credit; 1 recitation.

112. FRENCH. A continuation of course 111.

Prerequisites: Courses 101, 102, 103, 104, 111.

Second semester; 1 credit; 1 recitation.

GERMAN

201. GERMAN. Grammar; elementary forms with oral and written exercises; reading of 100-150 pages of easy prose.

First semester; 3 credits; 3 recitations.

202. GERMAN. A continuation of course 201.

Prerequisite: Course 201.

Second semester; 3 credits; 3 recitations.

203. GERMAN. Grammar continued; reading of intermediate texts; oral and written exercises.

Prerequisites: Courses 201, 202.

First semester; 3 credits; 3 recitations.

204. GERMAN. A continuation of course 203.

Prerequisites: Courses 201, 202, 203.

Second semester; 3 credits; 3 recitations.

In addition to the regular second year's work, a special elective conversational course is offered for all students who have completed the first year's work. (See course 211.)

205. GERMAN. Science course. Reading of selections from German scientific texts.

Prerequisites: Courses 201, 202, 203, 304.

Elective; first semester; 2 credits; 2 recitations.

206. GERMAN. A continuation of course 205.

Prerequisites: Courses 201, 202, 203, 204, 205.

Second semester; 2 credits; 2 recitations.

207. GERMAN. A general three-year course comprising selections from the various classes of literature, together with composition and conversational exercises.

Prerequisites: Courses 201, 202, 203, 204.

First semester; 3 credits; 3 recitations.

208. GERMAN. A continuation of course 207.

Prerequisites: Courses 201, 202, 203, 204, 207.

Second semester; 3 credits; 3 recitations.

209. GERMAN. Conversational course. Provides interesting and profitable conversational drill on practical everyday topics and includes, in a new form, a helpful review of the elements of the language.

Prerequisites: Courses 201 and 202.

First semester; 1 credit; 1 recitation.

210. GERMAN. A continuation of course 209.

Prerequisites: Courses 201, 202, 203, 204, 209.

Second semester; 1 credit; 1 recitation.

211 GERMAN. Conversational course. Provides well-graded and systematically planned talks on all sorts of topics.

Prerequisites: Courses 201, 202, 203, 204.

First semester; 1 credit; 1 recitation.

212. GERMAN. A continuation of course 211.

Prerequisites: Courses 201, 202, 211.

Second semester; 1 credit; 1 recitation.

SPANISH

301. SPANISH. Grammar; elementary forms; oral and written exercises; reading of easy text, 100-150 pages.

Sophomore year; first semester; 3 credits; 3 recitations.

302. SPANISH. A continuation of course 301.

Second semester; 3 credits; 3 recitations.

303. SPANISH. Grammar continued; reading of intermediate texts; oral and written exercises.

Prerequisites: Courses 301, 302.

First semester; 3 credits; 3 recitations.

304. SPANISH. A continuation of course 303.

Prerequisites: Courses 301, 302, 303.

Second semester; 3 credits; 3 recitations.

In addition to the regular second year's work, a special elective conversational course is offered for all students who have completed the first year's work.

305. SPANISH. Conversational course. Provides interesting and profitable conversational drill on practical everyday topics and includes, in a new form, a helpful review of the elements of the language.

Prerequisites: Courses 301, 302.

First semester; 1 credit; 1 recitation.

306. SPANISH. A continuation of course 305.

Prerequisites: Courses 301, 302, 305.

Second semester; 1 credit; 1 recitation.

307. SPANISH. General third year course. Reading of standard selections from Spanish general literature with composition and conversation.

Prerequisites: Courses 301, 302, 303, 304.

First semester; 3 credits; 3 recitations.

308. SPANISH. A continuation of course 307.

Prerequisites: Courses 301, 302, 303, 304, 307.

Second semester; 2 credits; 2 recitations.

309. SPANISH. Conversational course. Provides well-graded and systematically planned talks on all sorts of topics.

Prerequisites: Courses 301, 302, 303, 304.

First semester; 1 credit; 1 recitation.

310. SPANISH. A continuation of course 309.

Prerequisites: Courses 301, 302, 303, 304, 309.

Second semester; 1 credit; 1 recitation.

PHYSICS

PROFESSOR WENIGER

MR. BEVAN

MR. BLAIR

MR. BELKNAP

The following courses are offered:

A. **ELEMENTARY PHYSICS.** An elementary or high school course in physics.

The vocational course in Mechanic Arts; third year; first semester; 3 credits; 3 recitations; 1 laboratory period.

B. **ELEMENTARY PHYSICS.** A continuation of course A.

Second semester; 3 credits; 3 recitations; 1 laboratory period.

1. **GENERAL PHYSICS.** A course in general physics, descriptive rather than mathematical in character, covering the subjects of mechanics and heat.

Prerequisites: Elementary physics; geometry.

The course in Agriculture, freshman year; the course in Forestry and Industrial Arts, sophomore year; elective in the course in Commerce, freshman year; first semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period.

2. **GENERAL PHYSICS.** A continuation of course 1 covering the subjects of sound, light, electricity, and magnetism.

Required as listed under course 1; second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period.

3. **GENERAL PHYSICS.** A special course offered during the year 1914-15 for those who have not had elementary physics.

Required as listed under course 1; first semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period.

4. **GENERAL PHYSICS.** A continuation of course 3. Courses 3 and 4 together will cover mechanics, heat, and electricity.

Required as listed under course 1; second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period.

101. **ENGINEERING PHYSICS.** A course in mechanics and heat.

Prerequisites: Elementary physics; trigonometry.

The course in Electrical Engineering, Highway Engineering, Irrigation Engineering, Logging Engineering, Mechanical Engineering, and Mining Engineering; sophomore year; first semester; 4 credits; 2 lectures; 3 recitations; 1 laboratory period.

102. **ENGINEERING PHYSICS.** A continuation of course 101, covering the subjects of electricity and magnetism, sound and radiation.

Sophomore year; second semester; 4 credits; 2 lectures; 3 recitations; 1 laboratory period.

131. **HOUSEHOLD PHYSICS.** A brief descriptive course with such applications as are of greatest interest to students in Home Economics.

The course in Home Economics; sophomore year; first semester; 4 credits; 3 lectures; 2 recitations; 1 laboratory period.

201. **ELECTRICAL AND MAGNETIC MEASUREMENTS.** A laboratory course in the exact determination of electrical and magnetic quantities, calibration of instruments, etc.

The course in Electrical Engineering; junior year; first semester; 2 credits; 1 three-hour laboratory period.

The course will be repeated during the second semester, as an elective, should a sufficient number of students apply.

202. **ELECTRICITY AND MAGNETISM.** An advanced course, taking up the theory of electrical measuring instruments, etc., with suitable practice in the laboratory.

Elective; credit to depend on work done.

211. **HEAT AND LIGHT.** An advanced course, taking up the phenomena of heat and light in detail, including recent discoveries.

Elective; credit to depend on work done.

212. **ILLUMINATION.** A study of illuminants and their utilization in exterior and interior illumination.

Prerequisites: Physics 101, 102.

The course in Electrical Engineering; elective; senior year; second semester; 3 credits; 2 recitations; 1 three-hour laboratory period.

222. **WIRELESS TELEGRAPHY.** A study of electric waves, their measurement, and their application to practical wireless telegraphy.

Prerequisites: Math. 51, 52; E. E. 101.

The course in Electrical Engineering; junior or senior year; elective; second semester; 3 credits.

PHYSICAL EDUCATION

PROFESSOR STEWART

PROFESSOR THAYER

MR. ARBUTHNOT

MISS PLOCK

MISS LEWIS

MISS CLEAVES

MR. _____

PHYSICAL EDUCATION FOR MEN

ATHLETICS. All College athletic contests are under the jurisdiction of the athletic board, composed of two members of the faculty, two members of the student body, and one alumnus; and the faculty committee on athletics, composed of six members of the faculty.

Direct and active supervision comes from the athletic board, while the faculty committee determines matters of policy and questions which have an important relationship to College affairs. The athletic board supports representative teams in football, basketball, wrestling, track and baseball, and awards monogram "O's" to members of these teams. The most efficient coaches are furnished to all of these teams, while assistants teach the theory and practice of the various sports to freshmen and other teams.

The new gymnasium will furnish to the students at the Oregon Agricultural College the most modern and complete equipment for specializing in indoor sports, while the new athletic field now under course of construction will include a new quarter-mile track, two football fields, and two baseball diamonds, together with eight tennis courts and outdoor handball courts.

The armory, one of the largest of its kind in the United States, provides fine facilities for winter training in football, track, baseball, and the various other outdoor sports. An indoor track, which is but eight laps to the mile, furnishes facilities which are proving a great aid in shaping all of the teams into condition.

GYMNASIUM WORK. Because physical health determines capacity for efficiently carrying out work which a student prepares for in college, the importance of Physical Education in the modern educational institution is being emphasized more and more every year. The functions of this department are: (1) to develop organic power, the basis of vitality, necessary to physical and mental

efficiency; and (2) to secure and maintain a good posture, harmonious muscular control, and a reasonable degree of scientific training for expert gymnasium and field athletic work.

The new gymnasium for men, two units of which will be completed in time for work at the opening of the College in September, 1914, will be equipped with all of the modern gymnastic apparatus and facilities for properly carrying on the work in physical education and recreation. The floor, 90x150 feet in dimensions, will furnish ample space for the most efficient type of gymnasium work. It will be surrounded by a running track of fourteen laps to the mile.

Features of the new gymnasium which will add to its attractiveness will be two regulation sized handball courts; two squash courts; three basketball courts; regulation sized, padded rooms for boxing and wrestling; bowling alleys; steel lockers to accommodate all the men students; modern hygienic showers, steaming rooms, hot rooms, etc., for scientific care of the body.

The treasurer's receipt for the \$1.50 gymnasium fee entitles the holder to registration at the gymnasium office for full privileges of the gymnasium, including physical examination, chart of measurements, locker, free towels, etc.

On the basis of the physical examination, special work of such a nature as the student's physique demands will be assigned, and a careful plan outlined for the symmetrical development of the body.

Membership and regular practice on any of the varsity squads is accepted as an equivalent for gymnasium work during the active practice season, the attendance being reported weekly.

FALL WORK. Instruction is given in both theory and practice of Physical Education. During the warm weather of the first semester the department emphasizes the desirability of outdoor work, furnishing a large and efficient corps of instructors in football, basketball, tennis, volley ball, soccer, swimming, cross country, track athletics, etc.

WINTER WORK. The active gymnasium work starts with the beginning of the fall rains, about October 15, when outdoor work is no longer convenient. The work prescribed is intended to correct cases of scoliosis, flat-foot, weak chest, round shoulders, or any other deformity which is susceptible of improvement through prescribed gymnastics.

Recreative games, such as basket ball, hand ball, indoor baseball, wrestling, boxing, indoor tennis, volley ball, etc., are also conducted during the winter period.

SPRING WORK. In the spring, full advantage will be taken by the gymnasium instructors of the opportunity for cross-country runs, track and field work, and out-door games with the classes, during which occasions correct methods of breathing, form in running, and proper carriage of the body will be emphasized.

NORMAL COURSE. Many students expect to take up the profession of teaching after graduation from college. A general knowledge of the theories of physical education and methods of gymnastics and athletic instruction is often of material assistance in securing important teaching positions.

Students showing an especial aptitude and interest in physical education will be admitted to this course. The work will include lectures on the history and development of physical training, the general physiological principles of exercises, methods of teaching, and first aid to the injured. Calisthenics, gymnastic drills, apparatus work, games, and athletics will comprise the practical work of the course.

Elective; hours and credits subject to arrangement.

All sophomores, freshmen, and students of the Vocational courses, unless physically unable, are required to take physical training. The classes meet twice a week for sixty-minute periods.

One-half credit per semester is allowed for this work, and is a requirement toward graduation.

COURSES IN PHYSICAL EDUCATION FOR MEN

11. First year Vocational; first semester; 2 periods; $\frac{1}{2}$ credit.
12. First year Vocational; second semester; 2 periods; $\frac{1}{2}$ credit.
13. Second year Vocational; first semester; 2 periods; $\frac{1}{2}$ credit.
14. Second year Vocational; second semester; 2 periods; $\frac{1}{2}$ credit.
15. Freshman year; first semester; 2 periods; $\frac{1}{2}$ credit.
16. Freshman year; second semester; 2 periods; $\frac{1}{2}$ credit.
17. Sophomore year; first semester; 2 periods; $\frac{1}{2}$ credit.
18. Sophomore year; second semester; 2 periods; $\frac{1}{2}$ credit.

PHYSICAL EDUCATION FOR WOMEN

PURPOSE. The aim of this department is to bring each student to her best possible physical condition, and by a careful system of gymnastic training to correct faulty posture and carriage, to aid in the formation of habits of hygienic living, to establish a normal condition in the circulatory and respiratory systems, to secure bodily vigor, and to attain a healthy and symmetrical development, rather than the greatest increase in mere muscular power. Students are under the care of teachers who have had thorough medical training, and will be given special medical and corrective gymnastics, prescribed according to individual needs as indicated by their physical examinations.

REQUIREMENTS. Work in physical education is required of all women four periods per week in all full-year, special, optional, and vocational courses, regardless of the student's course or classification. One credit per semester is granted for this work. After the satisfactory completion of two years' regular work, the courses will be made elective or optional for women who pass a satisfactory physical examination and have a correct posture and carriage. Corrective gymnastics will be prescribed for all others, credit being allowed on the basis indicated above. At least four credits are required in Physical Education toward graduation.

Persons presenting credentials of work in physical education taken elsewhere may be given credit for such work in so far as it is equivalent to the requirements of this institution.

Women students are required to be able to swim a distance of 35 yards by the end of their sophomore year. (This requirement will go into effect after the completion of the swimming pool in the new gymnasium.)

SPECIAL CORRECTIVE AND MEDICAL GYMNASTICS. Students who are shown by their physical examinations to be unfit for the work of the regular classes in gymnastics and sports, or to have physical defects, will be assigned to corrective classes where the work is light and the emphasis is laid on correct breathing and posture, relaxation and rest; or, whenever necessary, students will be given private work in medical or corrective gymnastics according to their individual needs. Thus the physical condition of each student is carefully diagnosed and supervised. The instructors encourage

conferences concerning matters of health, personal and sex hygiene, and as far as possible advise proper treatment for the student's temporary ailments. They also take care of the emergency and first aid work for the women of the College.

COSTUMES. In order that the gymnasium costumes be hygienic and uniform, a regulation suit and shoes are required of all students. The shoes are sold by the local dealers, subject to the approval of the director. The suits should be ordered at the gymnasium office, immediately upon arrival at the College.

Good second-hand uniforms of outgoing girls will be for sale at about \$4.00, while the new uniforms cost \$5.00.

Special Work in Physical Education

Students permitted to pursue special work in Physical Education for the purpose of teaching, should elect classes in regular and corrective gymnastics besides Aesthetic and Folk Dancing and various kinds of outdoor sports. It should be noted, however, that only under special circumstances will such free election of courses be allowed.

In addition to the practice work, the following courses in theory are advised for students permitted to pursue this special work.

Physiology, Elementary and Advanced.

Hygiene, Personal and School.

Anatomy.

Biology, Elementary and Advanced.

Home Nursing.

Psychology.

English and English Literature.

German (knowledge sufficient to read and study medical works).

Education.

Sociology.

Bacteriology.

Physics (Elementary).

Chemistry (Elementary).

Play and Playground Games.

Public School Methods and Practice Teaching.

COURSES IN PHYSICAL EDUCATION FOR WOMEN

REQUIRED COURSES

In the regular courses in Elementary and Intermediate Gymnastics a variety of work is taught. Both the Swedish and German systems of gymnastics are used, and the best in both is adapted to the needs of the classes. Much emphasis is laid on correct posture and breathing. The following order is usually observed: (1) tactics; (2) exercises which include all the groups of muscles, taken free hand or with light hand-apparatus (wands, dumb-bells or Indian clubs); (3) apparatus exercises for those physically adapted; (4) recreative work at the end of the lessons, games, or fancy steps.

1. Elementary Secondary Gymnastics; first semester; four hours per week.

2. Elementary Secondary Gymnastics; second semester; four hours per week.

Prerequisite: Course 1.

3. Intermediate Secondary Gymnastics; first semester; four hours per week.

Prerequisites: Courses 1 and 2.

4. Intermediate Secondary Gymnastics; second semester; four hours per week.

Prerequisites: Courses 1, 2 and 3.

5. Elementary College Gymnastics; first semester; four hours per week.

6. Elementary College Gymnastics; second semester; four hours per week.

Prerequisite: Course 5.

7. Intermediate College Gymnastics; first semester; four hours per week.

Prerequisites: Courses 5 and 6.

8. Intermediate College Gymnastics; second semester; four hours per week. Participation in the Annual Pageant is a requisite for the completion of this course.

Prerequisites: Courses 5, 6 and 7.

(It will be noted that unless it is necessary for a corrective student to take gymnastics, she will be allowed to substitute for two periods of the above courses two periods per week in the elective courses described below.)

ELECTIVE COURSES

26. **CORRECTIVE GYMNASICS.** Open to all students who have need of remedial work. Special attention is given to those having spinal curvature, round shoulders, narrow chests, forward head, weak backs, pronated ankles, and other physical defects or weaknesses.

27. **OUTDOOR SPORTS.** Open to all students physically qualified. In this course are taught a variety of games, including baseball, indoor baseball, soccer, playground ball, cross ball, track athletics and relay racing. In the rainy season games are played in the Armory.

One, two, or three periods a week.

28. **BASKET BALL.** Open to students physically qualified. In good weather the games will be played outdoors.

One period a week for each class throughout the year.

29. **SOCCER.** Open to all students physically qualified.

One period a week in the spring and fall.

30. **BASEBALL.** Open to all students in spring and fall seasons.

One period a week.

31. **INDOOR BASEBALL.** Open to all students during indoor season.

One period a week.

32. **HOCKEY.** Open to all physically qualified.

One period a week in the spring and fall.

33. **CROSS BALL.** Open to all students physically qualified.

One period a week during the outdoor season.

34. **TENNIS.** Courts will be assigned to those who wish to play regularly.

35. **SWIMMING.** One or two lessons a week are allowed each student.

36. **FENCING.** Open to all students.

One period a week during indoor season.

37. **INDIAN CLUBS.** Open to all students.

One period a week during indoor season.

38. AESTHETIC DANCING. (Elementary). Open to all students. The purpose of this course is to develop grace and freedom of movement. Classic dancing, which is now considered one of the most important phases of gymnastic exercise, is emphasized.

One or two periods a week.

39. AESTHETIC DANCING. (Intermediate). Open to all students who have completed course 38.

One or two periods a week.

40. FOLK DANCING. Open to all students. In this course are taught a variety of peasant and national dances suitable for recreation or teaching.

One period a week.

41. THEORY OF GYMNASTICS. Open to all students interested in the teaching of school gymnastics. This course is very elementary, but gives an insight into public school conditions and methods of teaching practical gymnastics. Each student learns how to teach proper breathing, correct posture, and simple prescriptions of corrective exercises for round-shouldered and hollow-chested children. Practice teaching with children from public schools.

Two periods a week for one semester; 2 credits.

42. THEORY OF GYMNASTICS. Continuation of course 41, and open to all students who have completed course 41.

Two periods a week for one semester; 2 credits.

43. PLAY AND PLAYGROUND GAMES. Open to all students. This course is designed for public school teachers or students interested in playground work, or wishing to specialize in Physical Education. The psychology of play, adaptation of play to varying ages, necessity of supervision of play, simple equipment for school playgrounds, organization of games, will be given briefly. The majority of the time, however, will be given to the practice of various playground games and simple folk dances.

Five periods a week for one semester; 2 credits.

44. ARCHERY. One period a week in outdoor season.

MILITARY SCIENCE AND TACTICS

LIEUTENANT HENNESSEY

MR. DUGGER

The Oregon Agricultural College was founded in pursuance of three lines of national legislation. The first of these was the Act of Congress known as the Congressional Land Grant Act, of July 2, 1862, and the Acts supplemental thereto, for the establishment of colleges "where the leading object shall be, without excluding other classical and scientific studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts."

The absolute dependence of the College upon the benefactions of the Nation and the State imposes a particular obligation on all who enjoy its privileges. The College, on its part, conforming to the spirit of law, has provided for an efficient system of military instruction, and the Corps of Cadets is entitled to the loyal, zealous and true support of each and every student in the College. That it receives that support each year will be best evidenced by the standing which the corps attains among the military organizations of the higher universities and colleges.

The Congressional Land Grant Act of 1862 requiring military instruction, was passed during a critical period in the life of the Nation while it was engaged in a civil war. The best of evidence was then at hand showing the need of trained citizen soldiers prepared at all times for service in the cause of the Nation. The object of the law, therefore, was to provide well-trained citizen soldiers. The object has been successfully met. Students enrolled in the Military Department may attain a high state of military proficiency, if the spirit, as well as the letter of the law, is followed out during the prescribed course, thereby fulfilling a duty to the Nation, the State, and the College.

The military body of this College consists of one regiment of infantry having three battalions of four companies each, a hospital corps and signal corps detachment, and a band of fifty instruments. The drill and administration are the same as in the Regular Army.

One of the objects of this instruction is to prepare the cadet so that upon graduation he will be thoroughly competent to hold a commission in the National Guard or volunteer army.

The greater part of the instruction is directed toward having cadets adopt a systematic rule of conduct inculcating accurate methods in everything they undertake. This not only places cadets in the condition to receive favorably all instruction in the military department, but facilitates study in the other departments, and becomes a valuable asset to a young man going out into the world in any profession.

Military drill improves the habits and manners of the student, develops him physically, and gives him that military knowledge which it is desirable every citizen should possess in order that he may render intelligent aid to his country or state in time of need. It cultivates a manly spirit, ready and implicit obedience, respect for authority, and self-restraint—all qualities of inestimable value to a young man in whatever calling he may select.

Instruction in the course is prescribed for all undergraduate male students. The instruction is both practical and theoretical.

The new armory contains a drill room 120x300 feet in extent, ample office room, and suitable rooms for storing guns and other ordnance.

Eight hundred and forty modern U. S. magazine rifles (Krag-Jorgensen), with equipment and ammunition, are furnished by the U. S. government. Other necessary accoutrements and apparatus for the thorough equipment of the military department are furnished by the College.

Appointment and promotion of officers and non-commissioned officers, and their relative rank in each grade, are determined according to the military standing of the cadets, based upon a careful consideration of the following points: knowledge of drill and other duties, as determined by examination, practical application of this knowledge on the drill field, and recommendations of superior officers; zeal, soldierly bearing, and aptitude for command; character; military record; general standing in College.

Commissioned officers are selected from the senior class or from such students as have had three or more years of drill; non-commissioned officers, from the junior and sophomore classes; all re-

ductions are to the grade of private. All appointments and promotions are made by the Commandant, with the approval of the President of the College.

Work in military drill is required of all male students of the institution, including all regular degree students, and all vocational, special, and optional students, four periods per week throughout their undergraduate course. Senior privates may, however, upon petition approved by the President of the College, be excused.

One credit per semester is allowed for military drill, and grades are reported at the end of each semester the same as in any other subject.

Students physically unable to participate in the regular military drill may be assigned by the Commandant to light duty in the department.

Persons transferring to the Oregon Agricultural College with advanced credits from other educational institutions of equal rank will not be exempt from the military requirements, but will be required to offer an equivalent of credits for the back military credits represented or accumulated.

Persons presenting credentials for military work taken at other educational institutions, or for service in the U. S. Army, may be given credit for such work in so far as it is deemed equivalent to the requirements of this institution.

If for any reason a student is relieved from the military requirements, except as specified above, other credits must be substituted therefor.

The practical course in infantry includes the School of the Soldier; School of the Squad; School of the Company; School of the Battalion; School of the Regiment; Ceremonies; Intrenchments; Guard Duty; and Combat. The practical course in the Field Service Regulations will include the Service of Information and the Service of Security. The practical work in Small-arms Firing will include instruction preliminary to gallery and range practice; gallery practice; and range practice. A gallery range with four targets has been built and an outdoor range with four targets is being built. The instruction also includes company administration, camp sanitation, and map reading.

Paragraph 24, General Orders No. 70, War Department, November 18, 1913, directs that, "Upon occasions of Military Ceremony, in the execution of drills, guard duty, and when students are receiving any other practical military instruction, they shall appear in the uniform prescribed by the institution. They shall be held strictly accountable for the arms and accoutrements issued to them."

The wearing of mixed civilian and uniform clothing is prohibited at all times. The uniform complete costs about \$19.45; it is of the regulation olive drab color adopted by the United States Army, and makes a very neat and serviceable suit. It consists of an olive drab cap with ornament, an olive drab blouse with collar ornaments, a pair of olive drab breeches, an orange colored hat band, an orange colored breast cord, a pair of canvas puttee leggings of the new design, a pair of olive drab gloves, a pair of marching shoes as adopted in the United States Army, and an olive drab shirt. It is not advisable to purchase any of these articles before entering College as the necessity for uniformity in style, material, etc., makes it necessary to insist upon articles that conform to the standard set by the department. All of these articles can be purchased cheaper here than they can at other places on account of special arrangements made.

Students must come prepared to deposit the price of the uniform, for which they will be measured as soon as they learn the position of a soldier.

Proficiency in the military department is a requisite to graduation.

Military Drill 1. Freshman year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 2. Freshman year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 3. Sophomore year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 4. Sophomore year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 5. Junior year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 6. Junior year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 7. Senior year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 8. Senior year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 9. This is for students who may elect to drill and who are not required to drill by existing regulations. Also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. First semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 10. This is for students who may elect to drill and who are not required to drill by existing regulations. Also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. Second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill A. First semester; first year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill B. Second semester; first year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill C. First semester; second year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill D. Second semester; second year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill E. First semester; third year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill F. Second semester; third year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Special and optional students will be given credits in military drill as indicated above for undergraduate students. For their first semester's drill work they will be given credits in Military Drill 1. For their second semester's drill work they will be given credit in Military Drill 2. In the following years they will be given credits correspondingly.

1. THEORETICAL INSTRUCTION. This instruction consists of recitations in Infantry Drill Regulations, Field Service Regulations, Manual of Guard Duty, and Army Regulations; instruction in military correspondence and reports and returns; lectures on military subjects that pertain to the organization and administration of the United States military forces in peace and in war; and the Military Policy of the United States.

Military Science 1. Junior year; first semester; 1 credit; 1 recitation or lecture.

Military Science 2. Junior year; second semester; 1 credit; 1 recitation or lecture.

THE BRODIE BANNER is a richly decorated silken banner that is carried by the best drilled company as a mark of merit. Each year it goes to the company making the highest total number of credits in competitive drill. Company E carries the honor for 1914-15.

COLLEGE EXTENSION

The complete mission of the Oregon Agricultural College, as understood by those who are charged with the direction of its efforts and the determination of its policies, is to serve the people of the State. This service clearly extends to those who come to its campus and claim the advantage of its instructional work. But its mission does not end there. It is concerned also with the interests of all who may be in a position to benefit from its assistance. In the prosecution of this conception of the mission of the College, the Department of Extension is charged with the task of extending to the people of the State the advantages of their institution.

A valuable service in the form of institutes, lectures and demonstrations, demonstration trains, the preparation and distribution of bulletins, and cooperative work in connection with private and community interests has been maintained by the institution for a number of years through the indefatigable efforts of the authorities and staff members of the College and Experiment Station. The Extension Division, by giving exclusive attention to these phases of the College's activities, coordinates and directs the efforts of the various departments in their endeavor to meet the growing demands made upon the College for this type of work.

EXTENSION SUBJECTS. Extension teaching is concerned with all instruction given by the College which is not classified as a part of the regular resident work. The subjects which are included in the extension work are, therefore, all the subjects taught at the College which are of such a nature as to lend themselves to extension methods. While the College, in the past, has been exclusively concerned with agricultural and domestic science and art extension, it has now provided for extension work in all lines of instructional effort. In addition to all the various branches of agriculture which include agronomy, horticulture, gardening, animal and poultry husbandry, dairying, entomology, and other related subjects, extension instruction is being given in domestic science and art, forestry, mining engineering, mechanical engineering, electrical engineering, highway engineering, commerce, education, and other scientific and industrial subjects. While it is clearly impossible to attempt to

give complete and full courses in the great majority of these lines of work, there is much that is practical, usable, and valuable that can be taught through extension methods. It is, then, only such branches of the College work as can be effectively taught without residence requirement, that will come within the scope of extension work.

EXTENSION AGENCIES. The agencies, which the College uses in disseminating information among the people of the State, are as varied as the conditions which have to be met in carrying out the work.

The plan now in operation includes the use of institutes, movable schools, lectures, demonstrations, and demonstration trains, as one distinct group of extension methods. The institutes include the farmers' institutes, teachers' institutes, and special institutes, such as are held in connection with picnics, banquets, and other public or semi-public gatherings. The movable schools consist of a staff of lecturers, numbering from three to ten, who go out from the College equipped with portable laboratories for demonstrating their work, and who remain in each of the various communities from three days to a week. The lectures are given upon request at any of the many occasions when the service of some member of the College staff may be of value. Demonstration trains are run from time to time in cooperation with the railway companies. They vary in the scope of the work undertaken from a single car to a full train equipped to demonstrate many lines of work. By these methods, the College endeavors to extend directly to those who cannot come to it the advantages of its instruction.

In the second group are the correspondence courses. The plans provide ultimately for such courses in all the lines of work given at the institution which may be taught by this method. At present four courses are offered by correspondence; namely, (1) Shop Drawing—designed to meet the requirements of journeymen mechanics and trade apprentices; (2) Gas Engines, a course of instruction for those desiring to become familiar with the construction, care, and operation of the smaller sizes of gasoline engines; (3) Electricity and Magnetism—a course for electricians and others engaged in branches of electrical business; (4) Commercial Course—covering the subjects of (a) Farm Accounting, (b) Rural Eco-

nomics, (c) Commercial Law. These courses are offered to residents of the State for a nominal fee. Additional courses in other subjects will be added from time to time as demands are made for them.

Cooperative Work, or bringing the resources of the College, the State, and the Federal Government to the aid of community organizations, comprises the third division of extension activities. This provides for the organization and direction of boys' and girls' industrial club projects in connection with school and county fairs and the State Fair; it is also the means of supporting the cooperative dairy work now conducted by two specialists who devote their entire time to field work in connection with the proper development of the dairy industry in Oregon.

The College is concerned, also, in this connection, with organizations among the adults. It is the purpose of the extension lecturers to foster and encourage the organization of improvement associations and clubs throughout the State, and to assist them in all work which will tend to improve local conditions. Where these organizations now exist and are doing effective work the College will cooperate and assist in every possible way.

Organizations of this kind are now receiving valuable assistance from the Oregon Library Commission through the loan of well-selected libraries. The Commission has consented to cooperate with the Extension Division of the College in extending this line of work and making it even more effective. This should result in stimulating interest among the people of the State, and especially in the rural districts, in social and industrial conditions, and place within their reach the means by which their interests may be materially advanced and their conditions improved.

Extension publications and educational exhibits form the fourth division of the extension work. From this department there are published many bulletins written in clear, simple form telling the secrets of applied science and improved methods, and which make it possible for the laborer, the clerk, the farmer, the mechanic, and the housewife to ease and vitalize their daily tasks. Helpful articles are also furnished to the newspapers and the magazines.

The exhibits, which it has been the custom of the College to make at the State Fair, will be enlarged, and as funds become available

for the purpose others will be prepared for county fairs, association meetings, and conventions. These will be in the form of educational demonstrations.

One of the most important features of the College extension service, as provided for by laws passed in the 1913 Legislature, is the county farm management and demonstration work in agriculture. The new legislation authorizes the county court of each of the several counties of the State to provide and appropriate funds, either by special provision in the annual tax levy or by an appropriation of funds not otherwise appropriated, to be used in field work in agriculture and in promoting farm demonstration work in such county.

The law further provides that the State will appropriate one dollar for each dollar so raised by the respective counties, the appropriation not to exceed \$2,000 a year to any county having an area of 5,000 square miles or less, and not to exceed \$4,000 to any larger county. This fund is to be expended, and the work is to be done, under the supervision of the State Agricultural College in co-operation with the U. S. Department of Agriculture.

This feature of the law is responsible for the placing of county agricultural agents in such counties as have taken action under the law. These agents, under the direction of the Agricultural College, arrange for and carry on cooperative farm demonstration work with farmers in various sections of their respective counties; they study conditions, and advise with farmers as to the crops best adapted to their locality and the best methods in agricultural practice; they study marketing problems and assist the farmers in planning for the most profitable disposition of their products; they aid the teachers of the public schools in giving proper instruction in agricultural subjects, and help to interest our young people in country life, directing their energies into the proper channels. In short, the county agents are traveling agricultural evangelists devoting their time to improving country conditions and country life. It is their ambition to combine the results of scientific discovery with the best experience of practical farmers, and apply them to existing conditions.

PRESENT ORGANIZATION. During the next year the extension work will be organized and prosecuted according to the laws passed by the 1913 session of the State Legislature and in accordance with

the provision of the Lever-Smith bill recently enacted by Congress. This will be along the lines above indicated and to as great an extent as funds and conditions will permit. The College extension staff will be enlarged, and it is hoped that a greater number of the counties will take steps in the very near future to provide for the county field and demonstration work.

In the meantime, the College will continue to offer lectures, hold institutes, cooperate with the railway companies in running demonstration trains, publish extension bulletins, cooperate with the school authorities of the State in the advancement of industrial education, offer some courses by correspondence, prepare and circulate exhibits, furnish many valuable articles to the newspapers and magazines, and conduct demonstrations on farms and in the orchards of the State.

HOW TO APPLY. All persons or communities in the State wishing assistance in any of the lines indicated, should communicate with the Extension Department as far as possible in advance of the time the service is desirable. Short notice requests may not find the department in position to render the best service. If an institute is desired, be sure to give all particulars pertaining to the time, the nature of the subjects in which the community will be interested, the number of speakers desired, and the plans for the meeting. If a single lecture or demonstration or exhibit is wanted, be equally prompt and explicit.

It must be remembered that the College is willing at all times to help all who apply, but that its staff, facilities, and funds are limited, and so it sometimes is unable to give aid where it would like most to give it. However, the College can serve in the great majority of cases and is always ready and glad to do so.

Any county desiring to organize under the provisions of the law for agricultural field and demonstration work and the support of a county agriculturist should communicate with R. D. Hetzel, Director of Extension at the Agricultural College, in order to determine the best methods of procedure.

SCHOOL OF MUSIC

PROFESSOR GASKINS.

GENEVIEVE BAUM-GASKINS

MR. BEARD.

MRS. RESSLER.

MISS JOHNSON.

MISS BLOUNT.

MR. HELLIER-COLLENS

The advantage of studying music with instructors skilled in the psychology and practice of teaching cannot be overestimated. It results in an appreciable saving of time and expense and a maximum gain in efficiency. Hence the School of Music offers the following comprehensive courses of study to earnest students who wish to acquire scholarly musicianship at moderate cost. The courses may be begun at any time during the school year. All students may advance as rapidly as is consistent with good scholarship. The time required for completion of any of the courses is dependent upon the age, previous preparation, talent, ability, and character of work of each student.

In these courses the following subjects are included: elements of music, history of music, interpretation, languages, music form and analysis, music pedagogics, song singing, oratorio singing, opera singing, choral singing, organ playing, organ structure, piano playing, piano structure, sight reading, stage deportment, stringed instrument playing, wind instrument playing, brass instrument playing, theory, harmony, counterpoint, composition, voice culture. Outlines of the courses:

1. VOICE. Exercises will be given for correct breath control; purity of tone production; freedom of action and blending of registers; articulation and correct pronunciation and enunciation of vowels and consonants; elements of phrasing and style. Students must appear on programs if requested, singing from memory, and attend all rehearsals and recitals unless otherwise instructed by the Director.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; sight reading and ear training, two

hours a week; harmony and history of music, two hours a week each; choir and chorus practice. Physical education.

2. VOICE. This course consists of exercises for tone placing; phrasing and style; legato, marcato, and portamento delivery. Physiology of the vocal mechanism. First year German, Italian or French, at student's option unless otherwise advised by the Director. Songs and exercises of medium grade of difficulty. Attendance at recitals and rehearsals required, unless otherwise directed as above.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; harmony and counterpoint, two hours a week each; German, Italian or French, as required in beginning work by the department of Modern Languages; physical education; choir and chorus practice.

Prerequisite: Course 1 or its equivalent.

3. VOICE. This course includes the study of tone color, agility, the trill, messa di voce, recitation, declamation, phrasing, style, through the use of songs in English, German, French, Italian; the regular second year study of one of the above foreign languages at the student's option, in the department of Modern Languages, unless otherwise advised by the Director. Attendance at recitals and rehearsals required unless otherwise directed as above, singing from memory on programs of the School of Music when so required.

Required: Two lessons a week in voice; two lessons a week each in advanced harmony and harmonic analysis; German, French, or Italian, at student's option, second year study as required in department of Modern Languages; choir and chorus practice; physical education.

Prerequisite: Course 2 or its equivalent.

4. VOICE. This course includes advanced study of vocal technique by means of difficult exercises, songs, oratorios, operatic arias, declamation. Advanced composition throughout the year. Attendance at rehearsals required in preparation for public appearances, and at recitals, singing from memory. For graduation a public recital must be given as arranged by the Director, unless he may specify to the contrary. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 3 or its equivalent.

5. PIANO PREPARATORY COURSE. FOR BEGINNERS. Training of the hand, fingers, wrist, and arm. Extended preparation for scales and arpeggios; exercises for same. Chords. Octaves. Sonatinas by Clementi; Kuhlau; smaller compositions of Mozart, Handel, Beethoven, and other composers. Easiest sonatas of Haydn and Mozart. Selections from easier works of Schumann, Kullak, Reineke, and Grieg; other easy, appropriate compositions.

Required: Two lessons a week in piano; practice with instrument, one to three hours daily.

6. PIANO. Scales and arpeggios, tempi, accent, nuance, rhythm. Double notes. Trills. Exercises for endurance, speed, accent, and rhythm. Etudes from Czerny, Cramer, Kullak, Krause, two-part inventions and dance forms by Bach. Easier sonatas of Haydn, Mozart, Beethoven. Easier composition of Mendelssohn, Schubert, Schumann, Grieg, Raff, and others.

Required: Two lessons a week in piano; two lessons a week in harmony; two lessons a week in music history for thirty-six weeks; practice with instrument, two to four hours daily. Physical education.

Prerequisite: Course 5 or its equivalent.

7. PIANO. Two- and three-part inventions and suites by Bach. Etudes of Czerny, Cramer, Hasert, Berens. Sonatas of Beethoven of moderate difficulty. Sonatas of Mozart. More difficult selections from Weber, Mendelssohn, Schumann, Chopin, Grieg, Liszt, Mozart concertos; transposition of easy hymns; to sight read readily; to play from memory five compositions from the preceding course in a satisfactory manner.

Required: Two lessons a week in piano; two lessons a week for thirty-six weeks in advanced harmony; one lesson a week in counterpoint; practice with instrument three to five hours daily. German or French. Physical education.

Prerequisite: Course 6 or its equivalent.

8. PIANO. Collegiate Course: Well-tempered clavichord, chromatic fantasy and fugue, Bach. A limited number of etudes by Rubinstein, Chopin, Henselt. The more difficult sonatas of Beethoven. Solo works of Mendelssohn, Chopin, Schumann, Grieg, Liszt, Brahms. Concertos by Mozart, Mendelssohn, Beethoven.

Required: Two lessons a week in piano; practice with instrument three to five hours daily; two lessons a week in composition; one hour a week in harmonic analysis; German or French. Physical education.

To complete this course satisfactorily the student must fulfill the requirements above outlined and appear in programs when requested by the Director.

9. PIANO. Graduate Course: Beethoven sonatas Op. 57, 106, 110. Liszt Rhapsodies. More extended study of the principal classics and romantic composers. Solo works of modern composers. Concertos by Schumann, Chopin, Beethoven, and other composers.

Following is the list of graduate course pieces of which the student must play six from memory: Wagner-Liszt—Tannhauser March; Chopin—Scherzo in B Minor, op. 31; Mendelssohn—Rondo Capriccioso, op. 14, Prelude and Fugue in A Minor; Variations Serieuses; Schumann—Kreisleriana, op. 16, Carnival, op. 9; MacDowell—Marzwind and Wald Idyllen, op. 19, Nos. 1, 3, and 4; Bach—Fugue in A Minor, or his Italian Concerto; Handel—Suit in D; Moszkowski—Caprice Espagnol, op. 37; MacDowell—Concert Etude, op. 36; Grieg—Ballade; Liszt—Liebestod (Tristan and Isolde); Bach—Chromatic Fantasy and Fugue; Mozart—Fantasia in C Minor; Rubenstein—Sonata in F; Beethoven—Sonatas to be selected. Concertos by Chopin, Henslet, Hummel, Liszt, MacDowell, Mendelssohn, Mozart, and Saint-Saens, or five other works at teacher's option.

Required: Two lessons a week in piano; practice with instrument three to five hours daily; advanced German or French. For graduation, students are required to perform publicly under the direction of the School of Music, playing a program not less than one hour in length, arranged by the instructor and approved by the Director, which shall include two or more numbers equal in difficulty to any composition in the list of graduate course pieces. A diploma will be issued upon the satisfactory completion of this course.

10. THEORY. The course in theory will comprise systematic and progressive study in the elements of music. Consideration will be given to the theories of acoustics, to notation, scales, keys, modes, sight reading, intervals, melodic progression, tempo, dynamics,

rhythm, and ear training. Advanced theory will embrace harmony, counterpoint and subdivisions thereof, music history, concluding with form, composition, and orchestration.

11. VIOLIN. This course is preparatory, and designed to develop correct fingering, free bowing, and accuracy as to pitch and rhythm.

Studies. Sevcik School, Schradieck; major scales, minor scales in the first position; special sight reading duos by Mazas and Dancla. Other appropriate studies may be substituted for the above, if approved by the Director, as acceptable equivalents, the same to be satisfactorily performed before entering Course 12.

Students must appear in public recitals when required, playing from memory.

Required: Two lessons a week, harmony, music history, as in Course 6.

12. Studies by Kayser, Wohlfahrt, Schradieck, Mazas, Dont, and Kreutzer, or acceptable equivalents. Suitable solos, concertos, sonatas, etc. Students must appear in performance at public recitals when required by the management, playing from memory.

Required: Two lessons a week, harmony and counterpoint.

Prerequisite: Course 11.

13. This course consists of advanced studies by Fiorillo, Singer, Rhode, Gaviniès, Paganini; solos by Dvorak, Brahms, Vieuxtemps, Wieniawski, or other acceptable equivalents. Students must appear in public recitals when requested, playing from memory.

Required: Two lessons a week, harmonic analysis, composition, German or French, as in Course 8. As a qualification for graduation students are required to perform publicly, under the direction of the School of Music, a program not less than an hour in length, arranged by the Instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 12.

THE ORCHESTRA. Students of stringed instruments in attendance at the College, who are sufficiently advanced, may be admitted to membership in the College Orchestra by arrangement with the Conductor on such terms as may be approved by the Director. It is the intention of the management to encourage in every reasonable manner the development and maintenance of a good

orchestra under competent, progressive leadership. Students are invited to investigate these opportunities for excellent training in orchestra routine and solo playing.

Ensemble: Sonatas for violin and piano; string trios; quartettes for two violins, viola, and 'cello; and for four violins, will be studied. All students in the above classes, or registered in any of the above courses, must perform in public when requested by the Instructor and approved by the Director. Membership in the ensemble classes is free, and instruction is to be given by the principal violin instructor.

BAND INSTRUMENTS

Instruction will be given by the regular College band leader in the use of brass, wood-wind, and percussion instruments.

To become a member of the College Band, a student must pass a satisfactory examination in the elements of music and ability to perform on his instrument.

Members are required to attend rehearsals each school day, and a reasonable amount of individual practice is expected.

There is no charge for instruction in the band. Each member must furnish his own instrument and music stand, except basses, baritones, altos, and drums, whose instruments are furnished by the College.

Any student desiring to enter the band should see that his instrument is in low pitch.

The courses for the various band instruments are as follows:

14. CORNET. Methods by Arbou; characteristic studies by St. Jacome.

15. CLARINET. Methods by Dieppo; studies by Dieppo and Blume.

16. FRENCH HORN. Methods by Franz; studies by Franz and Hayffman.

17. In all other band instruments, including the oboe, bassoon, saxophone, alto, and bass clarinets, drummer's traps, xylophone, and orchestra bells, the courses will be similar to those given above.

The work in theory required to complete these courses is that outlined for piano courses 6 and 7.

18. **THEORY.** The course in theory will include systematic and progressive study of the elements of music; acoustics, notation, scales, keys, modes, sight reading, intervals, melodic progression, chords, rhythm, dynamics, and ear training.

Advanced theory will include harmony, counterpoint and subdivisions thereof, harmonic analysis, form, composition, and orchestration.

GENERAL INFORMATION

Any student in the Oregon Agricultural College with a satisfactory record in scholarship in his major course may take at least one hour a day in music.

Students in the School of Music may enter classes in the several departments of the College; and in order to enhance their general culture are encouraged to take at least one study throughout the school year other than the work required in the regular music courses.

Applicants for instruction may take complete or partial courses. Those registering for the former are classified as "regular music," while the others are classified as "special music."

"Special Music" students have the option of selecting such music studies as they desire by registering for the same with the Director in the regular manner and at the catalogue rates of tuition.

Non-resident young women are required to live in the dormitories, where their conduct is subject to the approval of the Preceptress. Outside rooming and boarding places may be obtained, subject to the approval of the College authorities. The rates for board and room are listed elsewhere in detail.

Students registered for study in the regular courses of the Oregon Agricultural College School of Music are subject to the same rules and regulations as all regular students in other courses.

No student is permitted to omit lessons or practice without sufficient excuse, and no refund will be made for absence from lessons or practice or for discontinuance, except in cases of severe personal illness; for such unavoidable absence, lessons may be made up only by appointment, and before the expiration of the term.

Lessons falling on legal holidays, or on special holidays petitioned for by the student body or by special student organizations, which may be granted by the College authorities, *will not be made up.*

Students will not be permitted to transfer tuition accounts to others, nor to receive credit for tuition fees beyond the assigned registration period, except in cases of severe personal illness, attested by a physician, or similar extreme necessity, and then only by making suitable arrangements with the Director.

The College year in the School of Music consists of thirty-six weeks, divided into terms of twelve weeks each, the first term beginning at the opening of College on September 21, 1914.

Private individual instruction is given in lessons of thirty minutes each, in all departments of the School of Music. Class instruction in theoretical branches is required of candidates for graduation, as specified in the preceding outlines of courses. Terms for instruction are as follows:

VOICE CULTURE AND SINGING—Professor Gaskins, private instruction:	
One lesson a week, a term	\$15.00
Two lessons a week, a term	30.00
ORGAN—Genevieve Baum-Gaskins, private instruction:	
One lesson a week, a term	\$24.00
Two lessons a week, a term	48.00
PIANO—Genevieve Baum-Gaskins, private instruction.	
One lesson a week, a term	\$15.00
Two lessons a week, a term	30.00
PIANO—May Babbitt-Ressler, private instruction.	
One lesson a week, a term	\$15.00
Two lessons a week, a term	30.00
PIANO—Instructor Corinne Blount, private instruction.	
One lesson a week, a term	\$12.00
Two lessons a week, a term	24.00
VIOLIN, VIOLINCELLO, VIOLA—Instructor Hellier-Collens, private instruction.	
One half-hour lesson a week, a term	\$12.00
Two half-hour lessons a week, a term	24.00
*One one-hour lesson a week, a term	22.50
*Two one-hour lessons a week, a term	45.00
BAND INSTRUMENTS—Instructor Beard, private instruction.	
One lesson a week, a term	\$10.00
Two lessons a week, a term	20.00
MUSIC HISTORY—Professor Gaskins, class instruction.	
Two hours a week, a term	\$ 3.00

*Stringed instrument students are not required to take "hour lessons," but may do so at their option at the above rates.

HARMONY, COUNTERPOINT, HARMONIC ANALYSIS—Instructors Johnson and Blount; class instruction, classes limited to six students.

Each subject two hours a week; tuition for each subject, a term\$ 7.50

COMPOSITION (including FORM), ORCHESTRATION—Instructor Blount, class instruction, classes limited to six students.

Two hours a week; each subject, a term\$ 7.50

PRACTICE

Rooms located in one of the College buildings have been suitably furnished for the use of students wishing to practice in private. These rooms may be rented for about one-third the cost of using pianos located in private houses, and without any of the disadvantages that must be endured in private homes. These practice rooms, with steam heat, good ventilation, good light, electric illumination for night practice, and good janitor service, are furnished with good pianos, kept in tune by the College. Students living in the College dormitories are required to practice upon these pianos. Students living away from the campus may arrange with the Director for practice on the same terms and conditions, as follows:

PIANO—

Term of twelve weeks, one hour a day	\$ 5.00
Two hours	7.50
Three hours	10.00
Four hours	12.50
Five hours	15.00

ORGAN—

Term of twelve weeks, one hour a day	\$12.00
Two hours	18.00

The pipe organ is a new, modern Kimball two manual, concave pedal board instrument of beautiful tone.

For additional information address William Frederic Gaskins, Director, Administration Building, Oregon Agricultural College, Corvallis, Oregon.

SUMMER SESSION

The chief purpose of the Summer School is to afford an opportunity for study to those unable to attend during the academic year. The courses are arranged for elementary and secondary teachers interested in Agriculture, Commercial branches, Home Economics and Manual Training; for credit in regular college subjects, as well as for prospective students deficient in entrance credit; for those interested in music and art; and for those desiring practical instruction in agriculture, household economics, and woodwork.

It is thought advisable to arrange for a series of two-weeks courses in addition to those continuing six weeks. They are provided for students who will not find it possible to remain longer than two weeks and are so planned that practically the entire time each day will be devoted to each special line of study. Should any decide to continue through the remaining four weeks of the summer session, a number of six-weeks courses, conducted on the topical method, will admit of the entrance of students with profit.

Of special interest is the inclusion in the two-weeks calendar of courses for boys and girls of upper grammar grades and high school age. At this formative period, an opportunity to study in an interesting way the problems of the two great fundamental occupations should arouse new ideals of the beauty, importance, and significance of such callings. The romance, as well as the dignity of agriculture and home pursuits have their appeal to youthful imagination, but ordinary school education, both consciously and unconsciously, places the emphasis on the professions and occupations leading to a public career.

A large faculty, chiefly regular College instructors, supplemented by a number of specialists from Oregon public schools and from other states, the extensive equipment in class rooms, laboratories, libraries, shops, and experimental fields, are at the service of the students.

The state-wide interest in garden and household contests of the public school pupils has resulted in a demand for more knowledge of these industrial subjects on the part of the teachers. The summer courses will not only provide specific and detailed instructions for conducting these contests, but will show the teacher how to use

the state-adopted text in elementary agriculture and supplement it with simple and interesting experiments both indoors and outdoors. In the same way, the direct and practical instruction in cooking and sewing will furnish the essentials for assisting the girl pupils. Any teacher who has the advantage of six weeks' contact with expert instructors and practical demonstrations in the work in which he is to direct his pupils, will greatly multiply his efficiency and usefulness in his community.

The winter short course comes at a time best suited to the convenience of the farmer. Professional and business men find their slack season during the summer; so also do the youths who are attending school, and the women of the family. The summer school offers them the opportunity of some study of the problem nearest every town dweller's heart—the acquirement of a piece of land and its cultivation. From the standpoint also of the beautification and sanitation of the dooryard and home premises, the kitchen-garden, house decoration, hygienic and economic preparation of foods, and other indoor problems, the summer school makes its appeal. Young men and women who are through high school, and others undecided as to their life work, may find just the leadings in summer study which will determine their future vocation.

RAILROAD RATES

To those attending the summer school, the railroad companies grant a special rate of one and a third fare for the round trip, on the certificate plan, from all stations in Oregon. In order to receive the benefit of the reduction, the purchaser must pay full fare to Corvallis, *securing a receipt from the ticket agent* at the time of purchase. This receipt must be countersigned by the College secretary at Corvallis, and on presentation to the ticket agent at Corvallis will secure rate of one-third for the return. This special rate takes effect three or four days before the opening date of the summer session and remains in force until the same length of time after the closing date. Tickets on this plan may be secured at any time while the school is in session, and are also good for return at any time. If, for any reason, receipt should not be secured at time of purchase, get train conductor's receipt, showing the form and number of your ticket. If a through ticket to Corvallis cannot be sold from your station, do not fail to get a receipt

for each ticket, even if the fare be paid on the train. The reduced rate is good only within the State; if you live beyond the State line, buy your ticket to a station in Oregon, and from that point to Corvallis.

ADMISSION AND EXPENSES

There are no entrance examinations or other educational tests for admission. Students desiring College credit must do the required work and pass satisfactory examinations at the close of the session. The registration fee of five dollars and a small laboratory fee to cover the cost of material in some of the courses, are the only charges made for class instruction, and entitle the student to admission to as many courses as he cares to attend during the entire session. Private, individual lessons in music will be given at the regular price charged during the school year; students taking music only, will not pay the College registration fee.

Waldo Hall, one of the two College dormitories for women, will accommodate over one hundred students with board and lodging. A charge of two dollars will be made to cover cost of heat, light, use of laundry, etc. No charge will be made for the use of the rooms, which are provided with bed, mattress, table, and chairs. Each room has closet, hot and cold water, and electric light. Each student who desires to occupy one of these rooms must bring bed pillows, pillow-cases, sheets, blankets or comfort, bed-spread, towels, napkins, and soap. The laundry room will be open for the use of students at Waldo Hall without extra charge.

Table board will be furnished at Waldo Hall at three and one-half dollars per week. Lists of private lodging and boarding places will also be provided and every assistance rendered in finding satisfactory accommodations. Furnished rooms for light housekeeping may also be had.

Allowing \$23.00 for board and room, \$5.00 registration fee, and 50c for drayage on baggage, \$6.50 for laundry and incidentals, the minimum cost for the entire six weeks need not exceed \$35.00, exclusive of railroad fare. Those who take courses requiring textbooks must make some additional allowance, and others for small laboratory fees, but it is safe to estimate the absolutely necessary expenses, textbooks and all, under \$45.00.

SOCIAL AND OTHER FEATURES

The informal and recreation diversions from the class and study routine have not only a social but an educational value as well. These are so controlled and directed as to be inexpensive and unobtrusive. Opportunity for students to become acquainted with each other and with the instructors outside the class room may be had each evening at Waldo Hall, during the informal social hour and at the formal receptions and parties each week.

The College numbers among its faculty some of the best known popular lecturers in the State. Several will be heard in illustrated stereopticon addresses on interesting phases of Oregon's industrial development. At least once each week an evening will be given up to entertainment, either in the form of a lecture of general interest, or a musical concert.

The tennis courts, baseball field, golf course, gymnasium, and other recreation resources of the institution may be used by the students and instructors, free of charge. Boating on the Willamette and Mary's rivers, picnics and excursions to various points of interest, including Mary's Peak, and week-end trips to the ocean at Newport, will also be available for those who desire to indulge in these recreations. The social features of the Summer School are given careful attention, so they may not come in conflict with the regular work, but at the same time be full of pleasure and interest.

COURSES OF INSTRUCTION

The summer instruction is of two general kinds: the regular College courses, reciting a sufficient number of periods per day to equal the credits of one semester; and special courses organized for needs not met by the regular instruction. For the session of 1914, ten regular courses in agriculture are offered, including Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, and Poultry Husbandry. Other regular courses are given in Art, Botany, Chemistry, English, Geology, History, History of Education, Mathematics, Modern Languages, Physics, Psychology, School Administration, School Management. Special courses are offered in Elementary Agriculture, Domestic Science, Domestic Art, Manual Training, Drawing, Music, and Physical Education for teachers;

also special courses for those not caring to teach, in Agriculture, Domestic Science, Domestic Art, Woodwork, Music, Art. Provision is also made for the admission to the regular courses of those not desiring College credit, in order that the widest possible freedom of selection may be made.

SPECIAL ILLUSTRATED BULLETIN

Each spring, special circulars are issued, giving complete description of the various courses offered, statement in detail of living and other expenses, list of instructors, directions for registration, and other matters. These bulletins are illustrated with interesting views of the College campus. Copies may be obtained by addressing the director, Professor E. D. Ressler, or the Oregon Agricultural College, Corvallis, Oregon.

WINTER SHORT COURSE

For many years the Oregon Agricultural College has offered each winter one or more courses of lectures and demonstrations which have been known as Winter Short Courses. These courses have been so generally successful and have called forth so many expressions of approval from those in attendance, that the work has expanded until several courses are given in each of the following schools:

School of Agriculture.

School of Home Economics.

School of Forestry.

School of Engineering.

School of Commerce.

Each of these courses, except the one in Industrial Arts, which will consist entirely of practical work in the shops or in the draughting room, will consist of a series of lectures supplemented by demonstrations, and by practical exercises in the dairy, the orchard, and the various laboratories.

The work offered will be adapted to the various needs of farmers, fruit growers, dairymen, mechanics, or of women in the home. It is believed, also, that teachers who desire to prepare themselves to teach Elementary Agriculture, now required in our public schools, will find these courses decidedly helpful.

The various courses are so planned as to provide the largest amount of practical information in the short time available. The subjects to be discussed are those in which every farmer should be interested, and the aim will be to present them in the most practical manner possible. The laboratories and collections, the shops, the creamery, the orchards, the College farm, the cutting, fitting, and sewing rooms; the dining rooms and kitchens—all offer facilities for demonstration or for practical exercises by the students attending these courses. A pleasing and profitable feature of these courses will be a series of lectures by prominent men who are qualified by successful experience to speak upon some particular phase of Agriculture.

Special lessons in Music may be taken by short course students at the regular rates listed under the School of Music.

Students should report to the Registrar for registration and for assignment to the various classes. The inclusive dates of these short courses are as follows: Farmers' Week, November 30 to December 5; Winter Short Courses, January 4 to January 30; Forestry Short Course, November 2 to April 16. A list of boarding and lodging places may be consulted at the office of the Y. M. C. A.

No entrance examination or other educational test will be required; but no one will be received who is less than sixteen years of age. Over fifteen hundred men and women registered in these courses in 1911, their ages ranging from sixteen to over seventy-five.

There will be no fees whatever for attending the exercises of Farmers' Week. Those who attend the other courses will be expected to pay a registration fee of \$1.00. In addition, students who elect certain courses will be expected to pay small fees, to cover the cost of materials used, as indicated in the following list:

	Fees	Deposits
Apple Packing	\$2.50	
Basketry	1.50	
Blacksmithing	3.00	
Dairying	1.00	\$2.00
Dressmaking .....	.25	
Food Preparation (Invalid)	2.00	
Food Preparation (Simple)	3.00	
Millinery .....	.50	
Plant Propagation .....	.50	
Pruning, Advanced .....	.50	
Spraying Laboratory .....	.50	
Woodworking	3.00	

Board and lodging may be had in Corvallis at \$4.50 to \$6.00 per week.

RAILROAD RATES. The railroad companies grant a rate of one and one-third fare for the round trip on the usual certificate plan.

A circular descriptive of all Short Course work will be issued about November 1, and may be obtained by addressing the Registrar, Oregon Agricultural College, Corvallis, Oregon.

SCHOOL OF AGRICULTURE

The School of Agriculture offers to its Short Course students instruction in the following courses; viz., Agronomy, Animal Hus-

bandry, Dairy Husbandry, Poultry Husbandry, Horticulture, and Crop Pests. In addition to these courses, students are advised to take advantage of the courses in Rural Economics which are offered in the School of Commerce, as well as the course in Rural Highways, in the School of Engineering.

Something of the nature of the work is indicated in the following program of a single day's lectures as given during January, 1913. For more detailed information regarding these courses, write for the descriptive circular mentioned above.

TUESDAY, JANUARY 28, 1913

A. M.

- 8-9. Principles of Fruit Growing.
C. I. Lewis.
Dairy Herd Management.
E. R. Stockwell.
Irrigation Farming.
W. L. Powers.
- 9-10. Soil Fertility.
H. D. Scudder.
Commercial Vegetable Growing.
A. G. Bouquet.
Landscape Gardening.
A. L. Peck.
Anthracnose of Loganberry and Other Cane Fruit Diseases.
H. S. Jackson.
- 10-11. Cabbage and Cauliflower Insects.
A. L. Lovett.
Vegetable Marketing.
A. G. Bouquet.
Flower Forcing.
A. L. Peck.
- 11-12. Principles of Fruit Growing.
C. I. Lewis.
Farm Machinery.
E. M. D. Bracker.
Swarms and Swarming.
H. F. Wilson.
- 10-12. Sheep Judging.
E. L. Potter.

P. M.

- 1-2. Farm Management.
H. D. Scudder.
- 2-3. Oregon Seed Crops.
G. R. Hyslop.

- 3-4. Mutton and Wool Production.
E. L. Potter.
Farm Drainage.
W. L. Powers.
- 4-5. Breeds of Sheep.
G. R. Samson.
- 2-5. Orchard Practice (Sec. 1).
R. W. Allen.
Spraying (Sec. 2).
V. R. Gardner.
Plant Propagation (Sec. 3).
F. C. Bradford and E. J. Kraus.
Fruit Packing (Sec. 4).
F. R. Brown.
Orchard Economics.
C. I. Lewis.
- 8-9. The 1912 Apple Market.
E. H. Shepard, Editor "Better Fruit."

The work is so arranged that at each hour of the day lectures may be heard and demonstrations witnessed on special Agricultural phases. The work in the other schools is similarly arranged.

FARMERS' WEEK

The exercises of Farmers' Week will begin Monday noon, November 30, and will close Saturday noon, December 5. They will be conducted somewhat upon the plan of an extended farmers' institute, and will consist principally of lectures, supplemented by such demonstrations and practical exercises as are made possible by the equipment of the College and Experiment Station. The aim of the course will be to give to those in attendance the largest possible amount of information regarding the principles of successful agricultural and horticultural practices. The lectures and demonstrations by the various members of the faculty will be supplemented by one or more lectures each day by some of the most successful men in the State.

COMMERCE

COMMERCIAL WORK. To meet the demand for a short, practical business course, the work outlined below will be offered under the same conditions and entrance requirements as other winter courses.

BOOKKEEPING. This course will embrace the fundamental principles of double entry bookkeeping. It will be made strictly prac-

tical and only sufficient theory will be introduced to give the student a firm foundation for his work. The basis of the work will be a study of a model general store equipped with the latest labor-saving methods of bookkeeping and office practice. Two laboratory periods daily.

BUSINESS ARITHMETIC. In connection with the course in bookkeeping, the instructor will review the fundamental processes of business arithmetic for the benefit of those who need it.

COMMERCIAL LAW. The course in Commercial Law will begin with the thought that there are certain fundamental principles of commercial law with which everyone should be familiar, and will include the following important subjects: property, contracts, negotiable instruments, interest and usury, bailment, agency and partnership, and real estate. Three recitations per week.

BUSINESS FORMS AND LETTER WRITING. The purpose of this course will be to familiarize the student with various forms used in general business practice. Exercises will be required illustrating both principle and practice in a clear, simple understandable manner. In the work on letter writing the correct form, wording, and general arrangement of the business letter will be taken up. Original letters, received from the most important manufacturing concerns and business houses of the United States, will be studied. Three recitations per week.

PENMANSHIP. The work in penmanship will embrace the study and practice of the best forms and style of practical business writing. The primary aim of the course will be to develop an easy, rapid, legible business hand. Two recitations per week.

TYPEWRITING. The work in typewriting will be outlined to suit the requirements of the individual student. The beginner will be taught the correct method of fingering, the uses of the various parts of the machine, the care of the machine, manifolding, and the correct arrangement of the typewritten letter or form.

FARM ACCOUNTING. A complete analysis of farm accounts by different methods, in which simplicity, accuracy, and labor-saving are emphasized; household and personal accounts; cost accounting and special records; cost of production; special cost records; labor records; milk records; poultry records; etc.; the farm plot; office methods; business organizations; business correspondence and business forms. Two lectures; two recitations per week.

RURAL LAW. The general principles of common and statutory law are discussed and explained; special phases of law affecting the farm, such as titles to real estate, deeds, mortgages, county records, etc.; landlord and tenant; eminent domain, and right-of-way; water rights and boundaries; laws governing shipping, insurance, banking, etc.; court procedure. Two lectures.

RURAL ECONOMICS. The fundamental principles of production, distribution, and exchange with special reference to rural life. Rural labor problems, farm finance, legislative problems affecting rural life, cooperative organizations, marketing products, advertising, the economics of machinery, transportation, etc. Three lectures.

HOME ECONOMICS

These courses are designed for all women who are interested in the practical and scientific working out of household problems, and who are unable to avail themselves of a regular course in Home Economics. Many agricultural men and their sons, yearly take advantage of the Short Courses which deal with the problems of the farm, such as feeding of cattle, judging of corn, study of soils, etc. It is to meet the demand of Oregon women who are interested in the correct feeding of the family, the judging and selection of materials used in the home, the making of suitable and attractive clothing, and study of sanitary conditions which lead to the health, comfort, and happiness of the family, that this course has been established, and is to be carried on.

FOOD PREPARATION. This course deals with the subject of foods and food preparation in its scientific and economic aspect. It is the study of the nutritive principles as they are found in various foods, and the method of cooking foods to retain those principles in digestive form; serving of food in simple and attractive form; economy of money, time, and labor being the watchword.

SPECIAL FOOD PREPARATION. This course consists of the selection and preparation of foods for children of different ages, adults in active life, the aged, and invalids.

HOME MANAGEMENT.

1. General health and welfare of the home.
 - (a) Economy of time, labor, and income.
 - (b) Sanitation of the home.
 - (c) Home nursing.

NOTE.—These courses have been planned to meet the needs of those who have had previous work, as well as those who are entering for the first time.

PLAIN SEWING. This course is planned for those women wishing instruction in the economical purchasing and making of household linens and underwear; the mending and renovating of old garments usually found in all households; the draughting of patterns for underwear to the student's own measurements, together with the practice of interpreting and using purchased patterns.

All women are eligible to this course.

DRESSMAKING. This course offers instruction in the principles of dressmaking; the taking of accurate measurements; the draughting and use of patterns; the choosing and economical cutting of materials; the making of at least one dress, with special emphasis on artistic color combinations and suitable design.

Tests will be made showing the adulterations of textiles; and simple methods of detecting the adulterations in dress materials will be given.

This course is given for those women who have had experience in sewing and dressmaking.

ADVANCED DRESSMAKING. Students who have previously taken one winter's short course will be given instruction in advanced dressmaking, if they so desire.

MILLINERY. This work will be given by lectures and demonstrations only. No practice work will be given to the students.

BASKETRY. This course will be given three times each week.

CARE OF CHILDREN. Three lectures each week will be given on the care of children. Only mature women will be admitted to this class.

CAMP COOKERY. The course in Camp Cookery consists of two laboratory lessons each week. It is especially designed for men, but women are admitted if the class is not already full. Only twenty students can enter these classes.

ENGINEERING AND INDUSTRIAL ARTS

It is the purpose to teach the subjects offered in a straightforward, practical manner, which can be readily grasped and understood by farmers, mechanics, and others who have had only the advantage of a common school education.

WOODWORKING. Considerable latitude will be allowed in choosing the particular line of work desired in this department as set forth under the following headings:

(a) A course for those not familiar with the care and handling of tools. This course affords instruction in the correct methods of using, sharpening, and caring for the tools of the carpenter's bench. The work is exemplified by exercises in planing, sawing, chiseling, and the construction of useful articles of furniture.

(b) The Steel Square and Its Use. This work includes laying out rafters, braces, stairs, and other work with the steel square. Lectures will be given on the use of the square, after which the actual construction of work will be undertaken by the student.

(c) Those already familiar with the use of bench tools may obtain instruction in machine work, such as band-sawing, jig-sawing, wood-turning, the care and management of woodworking machinery.

(b) Instruction in the use of paints, stains, and varnishes.

BLACKSMITHING. Two lines of work are offered in blacksmithing:

(a) Making repairs on machinery, tools, and farm implements. Students with no previous knowledge of blacksmithing are taught how to build and manage a forge fire; how to draw, bend, upset, forge, and weld iron; how to make chains, clevises, hooks, gate-hinges, whiffletrees and neck-yoke irons, and other useful articles.

(b) A course in working and welding steel for those with some general knowledge of blacksmithing. This course includes a study of the different grades of steel; the effect of heat treatment on the quality and temper of steel; the use of the color scale in tempering; and finally the forging, dressing, and tempering of steel tools.

ROSTER OF OFFICERS AND NON-COMMISSIONED OFFICERS OF THE MILITARY DEPARTMENT, JUNE 8, 1914

COMMANDANT

P. J. Hennessey, First Lieutenant, U. S. Cavalry

ASSISTANT COMMANDANT

C. F. Dugger, Post Commissary Sergeant, U. S. Army, Retired.

CADET REGIMENTAL FIELD AND STAFF

H. Odeen	Colonel	C. L. Robinson....	Capt. and Adjt.
R. M. Howard.....	Lieut. Colonel	J. C. Bonner....	Capt. and Qr. Mr.

NON-COMMISSIONED STAFF AND BAND

Dallas, W. R.....	Sergt. Major	McGinnis, L.	Sergeant
Ballhorn, O.....	Comsy. Sergt.	Stull, B. L.....	Sergeant
Thomas, G. R.....	Q. M. Sergt.	Akers, R.	Corporal
Jordan, M. H.....	Color Sergt.	Davis, D.	Corporal
Tinker, H. W.....	Color Sergt.	Day, R. C.....	Corporal
Woodcock, E.....	Chief Mus.	Holmes, F. A.....	Corporal
James, O. W.....	Prin. Mus.	Hardman, G.	Corporal
Walters, H. S.....	Drum Major	Kenton, R.	Corporal
Archbald, A. C.....	Sergeant	Luxton, W.	Corporal
Anderson, L. F.....	Sergeant	Nash, J.	Corporal
Kenedy, R.	Sergeant	Von Lehe, H.	Corporal

FIRST BATTALION

Major.....	A. F. Mason	Sergt. Major.....	O. B. Hayes
First Lieut. and Adjt.,	R. B. Boals		

COMPANY "A"

COMPANY "B"

CAPTAINS

Cronemiller, L. F.	Rice, T. A.
--------------------	-------------

FIRST LIEUTENANTS

Horning, E. E.

SECOND LIEUTENANTS

Evendon, J. C.	Thayer, G.
Smart, W. A.	

FIRST SERGEANTS

McFadden, C. L.	Berry, C. E.
-----------------	--------------

SERGEANTS

Whitby, R. H.	Macpherson, W.
Tartar, N. L.	Williams, J. F.
Cole, A. B.	Flanagan, C. B.
Johnson, A.	Lamb, H. N.

CORPORALS

Richards, D. E.	Frost, C. M.
Thompson, F. H.	Hoerner, G. R.
Vilas, N. E.	Johnson, P. N.
Hewitt, M. S.	Pearson, R.
Allingham, W.	Venstrand, C. P.
Graf, H.	Curtis, R. E.
Middlekauff, M. H.	Hill, C. E.
	Buchanan, B.

COMPANY "C"

Miller, C. N.

Irving, B. B.

Schuster, C. E.

Gentner, L. G. O.

Fletcher, A. T.
Taylor, J. L. V.
Wolff, G. T.
Koons, H.

Hurley, A. D.
Lange, A. J. H.
McClellan, T. R.
McMinn, R. B.
Story, C. L.
Turner, A. E.
Lee, E. F.
Strain, C.

COMPANY "D"

CAPTAINS

Rinearson, P.

FIRST LIEUTENANTS

Andrews, A. K.

SECOND LIEUTENANTS

Gambee, L. P.

FIRST SERGEANTS

Moe, F. L.

SERGEANTS

Clark, A. C.
Amort, F. P.
Harriman, A.
Warner, D.

CORPORALS

Amort, P. F.
Olcott, W. H.
Smith, C. F.
Reichart, E.
Shaver, L. A.
Watson, C. H.
Telford, W.

SECOND BATTALION

Major.....C. A. Dickey Sergeant Major.....G. Pelland

COMPANY "E"

COMPANY "F"

CAPTAINS

Howard, D. C.

FIRST LIEUTENANTS

Loken, E. B.

Edward, C. W.

SECOND LIEUTENANTS

Blackden, R. S.

Shirley, C. C.

FIRST SERGEANTS

Olsen, J.

Belton, H. C.

SERGEANTS

Paine, J.
Shurtliff, F.
Wright, B. C.

Gilbert, M. C.
Wright, R. V.
Williamson, C.
Zimmerman, E. E.

CORPORALS

Bartruff, F.
Burns, R.
Crumley, E.
Frick, R. B.
Lamereux, T. L.
Mason, W.
Tamerlane, R.
Woods, L. R.

Amort, A. A.
Bixby, C. M.
Fisk, C. E.
Funk, A. J.
Gerke, W. H.
Hackett, H. N.
Michaelbook, R.

COMPANY "G"

COMPANY "H"

CAPTAINS

Norton, J. E.

Kehrli, F. W.

FIRST LIEUTENANTS

Howard, W. W.

Siefert, H. W.

SECOND LIEUTENANTS

Gambee, H. C.

Wahlberg, L. E.

FIRST SERGEANTS

Ellestad, T.

Betzel, I. L.

SERGEANTS

Suffron, F.
 Anderson, E.
 Case, R. B.
 Schreiber, H.

Wilkins, M.
 Moore, M.
 Tadlock, H.
 Connor, R. M.

CORPORALS

Klinghammer, R. M.
 Porter, H.
 Shubert, B.
 Johns, M. S.
 Locker, L.

Laythe, L. L.
 Archibald, G.
 Powell, C. K.
 Taylor, A.
 Dietsch, F. J.
 Lantz, H. L.
 Fenn, D.

THIRD BATTALION

Major.....	A. O. Mangold	Sergeant Major	
First Lieut. and Adjt.			G. M. Stambach
	P. E. Freydig		

COMPANY "I"

COMPANY "K"

CAPTAINS

Cook, M. P.

Hayes, M. C.

FIRST LIEUTENANTS

Rawson, V. A.

Hammersley, R. R.

FIRST SERGEANTS

Gilbert, H. C.

Chambers, J. W.

SERGEANTS

Brown, W. H.
 Carson, W. G.
 Johnson, L. R.
 Myers, D. J.

Roberts, G. H.
 Fowler, R. G.
 Hopkins, G. E.
 Russell, H. W.

CORPORALS

Rush, B. F.
 Spaulding, H. C.
 Underwood, E. F.
 Babbitt, R. C.
 Tucker, J. E.
 Schreiber, M.

Floss, F. C.
 Mosby, D. C.
 Green, J. W.
 Loughery, L. H.
 Whitby, J. H.
 Hyams, L. K.
 Strom, C. L.

COMPANY "L"

COMPANY "M"

CAPTAINS

Neer, F. E.

Smith, D. R.

FIRST LIEUTENANTS

Anthony, W. B.

SECOND LIEUTENANTS

Baynard, C. C.

Magness, J. R.

FIRST SERGEANTS

Bowers, R. J.

Gildner, W. F.

SERGEANTS

Lamley, A. L.
Zwicker, A. E.
Moore, J. W.
Wilson, J. A.

King, L. A.
Crosby, H.
Kinderman, W.
Calkins, O. C.

CORPORALS

Lindsay, A. L.
Hathaway, M.
Struble, F. H.
Chambers, G.
Romig, F. V.
Parrish, R. A.

Brett, S. E.
Fox, K. L.
Sinks, V. H.
Brown, J. R.
Manning, K. C.
Mulkey, O.
Millikin, S. J.

CATALOGUE OF STUDENTS

(The following abbreviations are used to indicate the course in which the student is registered and the classification within the course: Agri., Agriculture; C. E., Civil Engineering; Com., Commerce; D. S., Domestic Science and Art; E. E., Electrical Engineering; For., Forestry; Ind. Arts, Industrial Arts; M. A., Mechanic Arts; M. E., Mechanical Engineering; Min., Mining Engineering; Phar., Pharmacy; Fr., Freshman; Soph., Sophomore; Jr., Junior; Sr., Senior; F. Sec., First Year Secondary; S. Sec., Second Year Secondary; Opt., Optional; Spec., Special; First Yr., first year of Pharmacy Short Course; Sec. Yr., second year of Pharmacy Short Course.)

GRADUATE STUDENTS

<i>Name.</i>	<i>Course</i>	<i>Home Address</i>
Barss, Alden F. (Cornell University)	Agri.	Rochester, N. Y.
Burgess, Charles Grant (Pomona College)	Agri.	Brighton, Mich.
Cole, Grace May (University of Oregon)	Agri.	Wilbur
Corsaut, Jesse Harrison (Kansas Agricultural College)	Agri.	Salina, Kan.
Cross, Homer Morton (O. A. C.)	Agri.	Corvallis
Gardiner, Harriett Barbara (Michigan Agricultural College)	D. S.	Lansing, Mich.
Hyland, Harold Wilson (Massachusetts Agricultural College)	Agri.	Weymouth, Mass.
Marshall, Roy Edgar (University of Nebraska)	Agri.	Lincoln, Neb.
Newman, Ollis Willard (Stanford University)	Agri.	Springfield, Mo.
Posey, Gilbert Bradley (Maryland Agricultural College)	Agri.	Riverside, Md.
Pratt, Hiram Eldridge (O. A. C.)	Agri.	Boston, Mass.
Ralston, Glancy Sherman (Colorado Agricultural College)	Agri.	Paradise, Calif.
Scherer, Christopher Marion (Wabash College)	Agri.	Brookville, Ind.
Schulte, Wilfred Adelbert (Western Reserve University)	Agri.	Corvallis
Shattuck, Obil (O. A. C.)	Agri.	Klamath Falls
Sprague, Helen Maude (O. A. C.)	D. S.	Corvallis
Tufts, Warren P. (University of California)	Agri.	Berkeley, Calif.

UNDERGRADUATE STUDENTS

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Abraham, Bernice	D. S.	Fr.	Roseburg
Abraham, Herman J.	Phar.	Fr.	Albany
Acheson, Gertrude	D. S.	Fr.	Portland
Adams, Mary Etta	D. S.	Sr.	Corvallis
Adolph, Chris	M. A.	F. Sec.	Newberg
Ahern, Merrie Ierne	D. S.	Fr.	Hugo
Aker, Homer F.	Agri.	Jr.	Chula Vista, Calif.
Akers, Robert	Agri.	Fr.	Portland
Albers, Harold Helmuth	Phar.	Jr.	Shoshone, Idaho
Albert, Paul	Agri.	Soph.	Seattle, Wash.
Alderton, Ada	D. S.	Jr.	Portland
Aldrich, Winifred Reba	Opt.		Corvallis
Alexander, George	Agri.	Spec.	Minneapolis, Minn.
Allen, Ethel E.	D. S.	Spec.	Corvallis
Allen, Frederick J.	Min.	Fr.	Portland
Allen, Harold B.	Phar.	Sec. Yr.	Lents
Allen, Leonard John	Agri.	Sr.	Cove
Allen, Martin H.	For.	Fr.	Salem
Allingham, William D.	M. E.	Soph.	Warm Springs
Allworth, Edith	D. S.	Sr.	Crawford
Allworth, Edward	Com.	Soph.	Crawford
Allworth, Helen	D. S.	Sr.	Crawford
Alward, Charles Wm.	Phar.	Fr.	Corvallis
Amerige, Violet	D. S.	F. Sec.	Astoria
Amesbury, Ruth	D. S.	Jr.	Portland
Amort, Albert Alexander	C. E.	Soph.	Corvallis
Amort, Frank P.	C. E.	Jr.	Orland, Calif.
Amort, Paul	M. E.	Soph.	Corvallis
Anderson, Alfred Stephen	E. E.	Soph.	Astoria
Anderson, Archie	Agri.	Fr.	Ashland
Anderson, Edmund G.	For.	Soph.	Albany
Anderson, Helen	D. S.	Jr.	Portland
Anderson, Isaac Milton C.	Agri.	Sr.	Drewsey
Anderson, Louis F.	Agri.	Sr.	Pendleton
Anderson, Marion	D. S.	S. Sec.	Albany
Anderson, Olaf	M. A.	S. Sec.	Astoria
Anderson, William	C. E.	Fr.	Portland
Andreson, Olaf	Agri.	Spec.	Vancouver, Wash.
Andrews, Alan Kendall	C. E.	Sr.	Medford
Andrews, Marie Anna	Opt.		Corvallis
Anthony, Hilda Florence	Opt.		LaGrande
Anthony, Marie	D. S.	Jr.	McMinnville
Anthony, Walter Burton	C. E.	Sr.	Carmel by the Sea, Calif.
Archbold, Alston Conway	E. E.	Jr.	Hillsboro
Archibald, Harold G.	For.	Soph.	Albany

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Archibald, Viva	D. S.	Sr.	Albany
Arens, Ralph Waldo	Agri.	Sr.	Parkdale
Armitage, Carleton	Agri.	Fr.	Sunset Beach, Calif.
Armstrong, Chester Hays	C. E.	Fr.	Salem
Armstrong, Fay	D. S.	Soph.	Corvallis
Armstrong, Jay M.	Agri.	Sr.	Lapeer, Mich.
Arnold, Edith Gertrude	Com.	Spec.	Providence, R. I.
Asbahr, Catherine	D. S.	S. Sec.	Cornelius
Ashcraft, Elmer	Min.	Fr.	Ashland
Ashenfelter, James	Com.	F. Sec.	Olex
Asplund, John W.	E. E.	Sr.	Marshfield
Atherton, Leona	D. S.	Sr.	Heppner
Atwood, Ralph	Agri.	Fr.	Sheridan
Ault, Indiana	D. S.	Jr.	Enterprise
Austin, Helen	D. S.	Fr.	Aberdeen, Wash.
Averill, William Samuel	Agri.	Fr.	Corvallis
Avery, Ruth	D. S.	Fr.	Klamath Falls
Axtell, Edward Goodchild	Agri.	Fr.	Corvallis
Ayers, A. A.	For.	Fr.	Lacomb
Babb, Harold Sidney	E. E.	Sr.	San Jose, Calif.
Babbitt, Richard Carrick	C. E.	Soph.	Corvallis
Backstrand, Carl Enoch	C. E.	Fr.	Portland
Bacon, Runa Elizabeth	Opt.		LaGrande
Bahr, Mrs. Alice Jenkins	Opt.		Grand Ronde
Bailey, Willis	Agri.	Fr.	Ashland
Bailiff, Florence	D. S.	Soph.	Corvallis
Baker, John Oscar	C. E.	Jr.	Portland
Baker, Verna	D. S.	Spec.	Corvallis
Baldwin, Frank Timmons	Agri.	Soph.	Baker City
Baldwin, Lee Ernest	Phar.	Soph.	Winlock, Wash.
Baldwin, Neil Burton	Com.	Spec.	Philomath
Ballard, Frank L.	Agri.	Jr.	Meredith, N. H.
Ballhorn, Otto	Com.	Jr.	Woodland, Wash.
Ballin, Herbert August	Agri.	Fr.	Portland
Bannister, Edna	D. S.	Fr.	Weston
Barden, Paul Elsworth	Com.	Fr.	Missoula, Mont.
Barden, Una Marguerite	D. S.	Fr.	Missoula, Mont.
Barnes, Clay A.	Agri.	Fr.	Goldendale, Wash.
Bartholomew, Lelia Mae	Opt.		Corvallis
Bartruff, Elmer W.	Agri.	Fr.	Salem
Bartu, Frank	M. E.	Soph.	Crabtree
Bartu, Mylo	M. E.	Sr.	Crabtree
Barzee, Faye Pearl	D. S.	Fr.	Corvallis
Bass, Chester Allan	Agri.	Soph.	Portland
Bassett, Olive	D. S.	Fr.	Newberg
Bates, E. G.	For.	Sr.	Williamsport, Pa.
Baum, Olin Huntington	Agri.	Soph.	Portland
Bayliss, Edwin J. C.	Agri.	Fr.	Lafayette

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Bayliss, John Clifford	Phar.	First Yr.	Myrtle Creek
Baynard, Claud Carthel	M. E.	Sr.	Portland
Beals, Agnes	D. S.	Soph.	Corvallis
Beals, Elva	D. S.	Jr.	Corvallis
Bechtel, Aimee	D. S.	Fr.	Creswell
Beck, Charline	Opt.		Corvallis
Beck, James Obye	Agri.	Jr.	Boise, Idaho
Beck, Pauline	D. S.	Sr.	Corvallis
Beck, Ursula	D. S.	Sr.	Aurora
Becker, Marian	Opt.		Keokuk, Iowa
Becker, Mary	D. S.	Fr.	American Falls, Idaho
Beckett, Carl Wm.	Agri.	Spec.	Salem
Beers, Ruby	D. S.	Fr.	Corvallis
Behnke, Olive Greene	D. S.	Fr.	Florence
Belton, Howard Claire	Agri.	Jr.	Gardena, Calif.
Bennett, Arthur	M. E.	Soph.	Dallas
Bent, Charles	Phar.	Soph.	Corvallis
Berks, Anna	D. S.	Spec.	Edenbower
Berry, Carl Evan	Agri.	Jr.	Hood River
Betzle, Irwin Leonard	Phar.	Jr.	Portland
Bewley, Charlcia	Opt.		Nashville
Bewley, Philip Mendenhall	Agri.	Sec. Yr.	Nashville
Bick, Norma	D. S.	Sr.	Philomath
Billie, Brewer Astor	M. E.	Jr.	Astoria
Binswanger, Alvin Otto	Agri.	Fr.	Portland
Binzer, Harry A.	M. E.	Fr.	Concrete, Wash.
Binzer, Karl Henry	Agri.	S. Sec.	Concrete, Wash.
Bixby, Clarence Milton	Agri.	Soph.	Freewater
Black, Emerson Perry	Agri.	Fr.	Corvallis
Black, Wm. Merle	Agri.	Spec.	Fossil
Blackden, Earl Benj.	For.	F. Sec.	Ashland
Blackden, R. S.	For.	Sr.	Ashland
Blackwell, Harlie A.	M. E.	Fr.	Juneau, Alaska
Blackwell, Helen S.	D. S.	Fr.	Juneau, Alaska
Blackwell, Ira	For.	Fr.	Aberdeen, Wash.
Blagg, Henry Wilson	E. E.	Fr.	Hood River
Blair, Joe Earl	Agri.	Fr.	Seattle, Wash.
Blakely, Cecil Grant	Com.	Spec.	Glide
Blakely, Harold G.	Phar.	Sec. Yr.	Brownsville
Blakely, Lloyd Herbert	M. E.	Soph.	Newport
Bliss, Cleveland Albert	Agri.	Fr.	Gresham
Boals, Ray B.	M. E.	Sr.	Dallas
Boies, Etta Philippi	Com.	Soph.	Corvallis
Boies, John	M. E.	Soph.	Corvallis
Boies, Thurza	D. S.	Jr.	Corvallis
Bolin, Francis Gerald	Agri.	Fr.	Portland
Bones, John Wm.	C. E.	Soph.	Carlton
Bonner, James Charles	Agri.	Sr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Bonney, Arthur A.	Agri.	Fr.	Tygh Valley
Boon, Walter Wm.	For.	F. Sec.	Portland
Boone, Earl	M. E.	Fr.	Toledo, Wash.
Boone, John C.	M. E.	Fr.	Toledo, Wash.
Boone, Stanley	Com.	Soph.	Stanley, Wis.
Booth, Bertha	D. S.	Sr.	Madras
Booth, Clarence	Phar.	Fr.	Amity
Boothe, Joe Miles	Agri.	Sr.	Union
Bosshart, Elizabeth	D. S.	F. Sec.	Warrenton
Both, Julius	Agri.	Fr.	Rainier
Bovingdon, James C.	E. E.	Fr.	Oakland
Bowen, Merle	D. S.	Sr.	Silverton
Bower, Hazel Harriet	Opt.		Corvallis
Bowers, Ralph J.	Agri.	Jr.	Seattle, Wash.
Bowman, Roy	E. E.	Fr.	Falls City
Boyer, Will M.	Min.	Soph.	Portland
Bozorth, Inez V.	D. S.	Jr.	Bay City
Bozarth, Levi S.	Agri.	Fr.	Amboy, Wash.
Brackett, Ethel Belle	Com.	Soph.	Rufus
Brackett, Florence Marie	Com.	S. Sec.	Rufus
Bracons, Josephine	Opt.		Portland
Brady, James	Com.	Spec.	Portland
Brandes, Irene	D. S.	Fr.	Portland
Branthoover, Lester Lee	Com.	Fr.	Fruitland, Idaho
Breithaupt, Alva	Agri.	F. Sec.	Portland
Brett, Sereno Elmer	For.	Soph.	Portland
Bristol, Ralph Ray	Opt.		Portland
Brixey, Homer	E. E.	Fr.	McMinnville
Brockman, Mildred Florence	D. S.	Soph.	Weiser, Idaho
Brogden, John Lewis	Agri.	Fr.	Hillsboro
Bromberg, H. Harold	Phar.	Fr.	Portland
Brown, Donald Edgar	Agri.	Soph.	Oregon City
Brown, Ellis Elmer	Agri.	Jr.	New Era
Brown, Florence	Com.	Spec.	Sheridan, Wyo.
Brown, Francis B.	Agri.	Fr.	Crystal
Brown, Harry Calvin	Agri.	Fr.	Smith River, Calif.
Brown, James Robert	Agri.	Spec.	Payette, Idaho
Brown, Mae	D. S.	Soph.	New Era
Brown, Wm. Hiram	Agri.	Jr.	Portville, N. Y.
Brown, Zoe Agnes	D. S.	Soph.	Seaside
Brownell, Dorothy	D. S.	Fr.	Portland
Brundage, Alfred Fleming	Agri.	Fr.	Fullerton, Calif.
Brunner, H. W.	For.	Fr.	Bellevue, Pa.
Brunquist, Edith	D. S.	Sr.	Hood River
Buchanan, Bayard B.	C. E.	Soph.	Roseburg
Budelier, Clarence Jos.	For.	Fr.	Rock Island, Ill.
Buick, Veva	D. S.	S. Sec.	Roseburg
Bullis, Deloss Everett	E. E.	Fr.	Payette, Idaho

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Burke, Volma	D. S.	Fr.	Cove
Burkhead, George Arthur	Agri.	Fr.	Monmouth
Burnell, Ina Ruth	D. S.	Fr.	Claremont, Calif.
Burns, Amelia Earle	D. S.	Jr.	Spokane, Wash.
Burns, John Richard	Min.	Fr.	Portland
Burns, Lillian E.	Com.	Fr.	Spokane, Wash.
Burns, Ralph Wilson	Agri.	Soph.	Tualatin
Bush, Eugene Stanley	M. A.	F. Sec.	Los Angeles, Calif.
Butler, Alice R.	D. S.	Sr.	Mapleton, Iowa
Byerly, Oliver F.	For.	Fr.	Portland
Byers, Oscar L.	For.	Fr.	Portland
Cadwell, Clytie Laurel	Agri.	Jr.	Seattle, Wash.
Cadwell, Jennie	D. S.	Sr.	Seattle, Wash.
Caldwell, Beulah	Opt.		Corvallis
Calkins, Nelta Grace	Opt.		Airlie
Calkins, Oscar	Agri.	Soph.	Airlie
Callison, Annabelle	D. S.	Sr.	Aberdeen, Wash.
Camp, Beryl	Phar.	First Yr.	Portland
Camp, Roy H.	M. E.	Fr.	Portland
Campbell, Edna Opal	D. S.	S. Sec.	Oak Bar, Calif.
Campbell, George Kenneth	Agri.	Fr.	Honolulu, Hawaii
Cannon, Owen Anthony	M. A.	F. Sec.	Mitchell
Cardinell, Horace Albert	Agri.	Jr.	Portland
Carlson, Alvilda	D. S.	Soph.	Corvallis
Carlson, Evelyn	Com.	Jr.	Corvallis
Carlson, Ned	Agri.	Fr.	Seattle, Wash.
Carlson, Ruth	Com.	Soph.	Corvallis
Carnie, Norval C.	Agri.	Fr.	Chicago, Ill.
Carpenter, Eugene Johnson	Agri.	Fr.	Ashland
Carroll, Maurine	D. S.	Fr.	Junction City
Carson, Walter Guy	C. E.	Jr.	Hermiston
Cartan, Hazel	D. S.	Sr.	Corvallis
Carter, Wilder Jameson	Agri.	Fr.	Aberdeen, Wash.
Case, Richard Burton	Agri.	Jr.	Portland
Case, Russell Jeffrey	Agri.	Soph.	Portland
Case, Theodore Dwight	Agri.	Fr.	Klamath Falls
Casper, Elsie	D. S.	Fr.	Union
Cathey, Evelyn	D. S.	Fr.	Corvallis
Catterlin, Merlin Herman	Agri.	Fr.	Bandon
Cavendar, Alberta	D. S.	Fr.	Portland
Chamberlain, Everett	Opt.		Labanon
Chamberlin, W. J.	For.	Jr.	Albuquerque, N. Mex.
Chambers, George Frederick	Min.	Soph.	Newberg
Chambers, Joseph W. Jr.	Agri.	Jr.	Newberg
Chandler, George Leo	Agri.	Spec.	Rogue River
Chapin, Douglas Bryant	C. E.	Jr.	Franklin Place, N. Y.
Chapler, Raymond Herald	For.	Jr.	Salem
Chapman, Charles Lloyd	Min.	Sr.	Sheridan

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Chase, Ernest	For.	Jr.	Corvallis
Chase, Lila	Com.	Soph.	Corvallis
Chase, Lucile	D. S.	Jr.	Salem
Cheadle, Dorothy	D. S.	Fr.	Lebanon
Chenault, Ralph Garfield	Agri.	Jr.	LaGrande
Cheney, Maribel	D. S.	Sr.	Coupville
Chindgren, Anton Benj.	Agri.	F. Sec.	Mulino
Chinn, Jas. Edgar	Phar.	First Yr.	Weiser, Idaho
Chioco, Juan O.	C. E.	Fr.	Santo Domingo, P. I.
Chrisman, R. J.	For.	Sr.	Danville, Ky.
Christensen, Carl	For.	S. Sec.	Boise, Idaho
Christianson, Herman Hans ..	Agri.	F. Sec.	Moro
Clark, Arthur Clarence	C. E.	Jr.	St. Johns
Clark, Carrie	D. S.	Soph.	Waitsburg, Wash.
Clark, Cedric William	Com.	Jr.	Canyon City
Clark, Frank Lewis	For.	Fr.	Portland
Clark, Wm. Beverly	For.	Spec.	Portland
Clausen, Arnold Alvin	C. E.	Jr.	The Dalles
Clausmeyer, Blanche	Com.	Spec.	Heppner
Clock, Audrey	Com.	Fr.	The Dalles
Clough, Huron Willoughby ..	C. E.	Sr.	Canyonville
Cobb, Cecil Edward	Com.	Spec.	Portland
Coe, Wayne Walter	Agri.	Jr.	Portland
Cohen, Benjamin Bernard	Agri.	Fr.	Portland
Cohen, Julius	Com.	S. Sec.	The Dalles
Cohn, Henry	Com.	Fr.	Heppner
Cole, Albert Benj.	Agri.	Jr.	Pasadena, Calif.
Cole, Grace Elizabeth	D. S.	Fr.	Portland
Cole, Harry Julius	Opt.		Emporia, Kan.
Coleman, Lawrence L.	Phar.	First Yr.	Roseburg
Collamore, Lorna Anne	D. S.	Fr.	Portland
Conklin, Evelyn	D. S.	Jr.	Grants Pass
Connell, Dorothy Marcella ..	Opt.		Portland
Conner, Edna	D. S.	Fr.	Sheridan
Conner, Raymond M.	C. E.	Jr.	Corvallis
Conner, Rhoda	D. S.	Fr.	Sheridan
Cook, Elsie	D. S.	Soph.	Philomath
Cook, Mortimer Parker	Agri.	Sr.	Portland
Cook, Susie	Opt.		Corvallis
Cooley, Florence	Phar.	Fr.	Junction City
Cooley, Inez	Phar.	Fr.	Junction City
Coon, Abbie R.	D. S.	Jr.	Corvallis
Cooper, Rodney Waldo	C. E.	Fr.	Dufur
Corbett, Grace Adelaide	Opt.		Corvallis
Corbin, Kathryn	Com.	Jr.	Portland
Cordiner, Peter Clarence	Phar.	Sec. Yr.	Astoria
Corey, Everett	Com.	Soph.	Medford
Corkins, Vernon G.	E. E.	Sr.	Enterprise

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Corl, Helen	D. S.	Fr.	Corvallis
Corl, Leland David	M. E.	Soph.	Corvallis
Cornell, Edna Frances	D. S.	Fr.	Grants Pass
Cornwall, Alice	D. S.	Fr.	Portland
Corrie, Bernice	D. S.	Fr.	Corvallis
Corrie, Eva Mary	Opt.		Corvallis
Coulter, Olive Ethlyne	D. S.	Jr.	Corvallis
Courtney, Lois	D. S.	Fr.	Portland
Covell, Spender Albert	M. E.	Sr.	Corvallis
Cox, Helen Madeline	D. S.	Soph.	Hood River
Cox, Walter Judson	Com.	Spec.	Portland
Craig, Asa P.	Agri.	Sr.	Enterprise
Craine, Erma M.	D. S.	Jr.	Bandon
Crain, William Wallace	Agri.	Soph.	Biggs, Calif.
Cramer, Floyd Samuel	M. A.	S. Sec.	Corvallis
Cramer, Olive F.	Opt.		Corvallis
Crane, Fred Hovey, Jr.	Agri.	S. Sec.	Cleone
Creekpaum, Alonzo B.	M. E.	Fr.	Cornelius
Crimmins, William	M. A.	F. Sec.	Chicago, Ill.
Crocker, Will J.	Phar.	Fr.	Holley
Crockatt, Edith	D. S.	Jr.	Pendleton
Cronemiller, Fred Parks	For.	Fr.	Lakeview
Cronemiller, Lynn	For.	Sr.	Lakeview
Crosby, Hartzell	Agri.	Jr.	Sherwood
Crouchley, E. F.	For.	Soph.	St. Louis, Mo.
Crouter, Leogrand DeHart	Com.	Soph.	Union
Crouter, Paul H.	Agri.	Fr.	Union
Cruikshank, Ivan M.	Agri.	Fr.	Portland
Crum, McKinley	Agri.	S. Sec.	Olex
Crumley, Elmer	Agri.	Soph.	National City, Calif.
Culver, Benj. C.	For.	Jr.	The Dalles
Cunning, Jennie M.	D. S.	Fr.	Baker
Currey, Hiram Meyrick	Agri.	Jr.	Ontario
Currey, Joseph Edmond	Agri.	Fr.	Olympia, Wash.
Currey, Pinney Alfred	Phar.	Fr.	Baker
Currin, Mary Edith	Com.	Fr.	Heppner
Curtis, Roland Edward	Agri.	Jr.	Claremont, Calif.
Dabney, Mary L.	Opt.		Hood River
Dallas, Earle Wesley	Agri.	S. Sec.	Corvallis
Dallas, Willis Robert	Agri.	Jr.	Corvallis
Damon, Leola	D. S.	Spec.	Corvallis
Damon, Ruth Columbia	D. S.	Fr.	Newport
Damon, Sumner John	Agri.	Sr.	Ferndale, Calif.
Danneel, Henry	E. E.	Fr.	Hillsboro
Davidson, Leffie	D. S.	Soph.	Portland
Davidson, Robert Hershel	Agri.	Fr.	Milton
Davis, Charles E.	Agri.	Fr.	Union
Davis, Charles Harold	Com.	Soph.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Davis, Durrell	Com.	Soph.	Independence
Davis, George Cecil	Agri.	Fr.	Hoquiam, Wash.
Davis, Mabelle Josephine	D. S.	Fr.	Corvallis
Davis, Percy Evert	Agri.	F. Sec.	Corvallis
Davis, Robert Ray	M. E.	Sr.	Hillsboro
Davis, William A.	Min.	Fr.	Los Angeles, Calif.
Davisson, Margaret	D. S.	Jr.	Central Point
Dawson, Mary Ethel	D. S.	S. Sec.	Skamokawa, Wash.
Day, Oswald Newton	E. E.	Fr.	Portland
Day, Ralph Coulter	C. E.	Jr.	Portland
Dean, Stella	Phar.	Jr.	Castle Rock, Wash.
Dearmin, Lillian G.	Com.	Soph.	Baker
Delmarter, James Elsworth	Agri.	Fr.	Alhambra, Calif.
Denny, Edward Bell Jr.	Agri.	Spec.	Newark, N. J.
Denny, Elizabeth	D. S.	Fr.	Salem
Deutsch, Henry C.	For.	Jr.	Portland
Dewey, Garrington Geo.	Agri.	Soph.	Marshfield
DeWitt, Charley H.	Agri.	Fr.	Portland
Deyoe, Harold Leroy	E. E.	Soph.	Portland
Dickerson, Jesse Earl	Agri.	Soph.	Parma, Idaho
Dickey, Chester Allan	Com.	Sr.	Molalla
Dietsch, Frank J.	Agri.	Soph.	Days Creek
Dilley, Dean	M. E.	Fr.	Gervais
Dinges, Grace May	D. S.	Sr.	Corvallis
Dobell, Roland	Com.	Fr.	Corvallis
Doerner, Armin Meredith	Agri.	Soph.	Denver, Colo.
Dolde, William Earl	Opt.		Guthrie, Okla.
Doolittle, Harold V.	Agri.	Fr.	Pomona, Calif.
Doolittle, Lydia	D. S.	Jr.	Corvallis
Doolittle, Maida	D. S.	Soph.	Corvallis
Dorsey, Glen Emerson	E. E.	Fr.	Louisville, Neb.
Doty, Paul	Agri.	Soph.	Pasadena, Calif.
Dowden, Ethelbert	Min.	Sr.	Plainview, Tex.
Downing, Hazel	D. S.	Fr.	Kingston
Downs, Addie Isabella	Phar.	Fr.	Cornelius
Doxsee, Earl DeWitte	Agri.	Jr.	Brownsville
Dunn, Edwin	Agri.	Fr.	Ashland
Dunn, Wallace Wilkinson	M. A.	F. Sec.	Corvallis
Dunsmore, B. Fay	M. A.	Spec.	Independence
Dupee, Cherie Mabel	D. S.	Fr.	Corvallis
DuRette, Cecil A.	M. A.	S. Sec.	Gervais
Durkheimer, Sylvan F.	Com.	Sr.	Portland
Dwyer, May	D. S.	Fr.	Portland
Eaton, Joseph Edmund	Opt.		Portland
Eaton, Karl	Agri.	Jr.	Yamhill
Eckley, Winfield	E. E.	Soph.	LaGrande
Eddy, Ben A.	C. E.	Sr.	Roseburg
Eddy, Delmar	Com.	Sr.	Kings Valley

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Edwards, Connor Whealdon	Agri.	Sr.	Monroe
Edwards, James Homer	Agri.	Fr.	Monroe
Edwards, Jess	Phar.	Sec. Yr.	Sumpter
Ehrman, Harry J.	E. E.	Jr.	Junction City
Eldridge, Shalor Charles	Agri.	S. Sec.	Independence
Ellestad, Theodore Alfred	Agri.	Jr.	Central Point
Ellestad, Melvin H.	M. A.	F. Sec.	Central Point
Embry, Clay T.	Agri.	Fr.	Clarkston, Wash.
Emery, Lee Earl	For.	Sr.	Corvallis
Engbretson, Albert	Agri.	Fr.	Astoria
Erickson, Anton	M. E.	Fr.	Portland
Ervin, Albert G.	Agri.	Fr.	Hood River
Estes, Marie	Opt.		Corvallis
Evenden, James C.	For.	Sr.	Warrenton
Failing, Kate Whittlesey	Agri.	Sr.	Portland
Farmer, Clifford	M. E.	Fr.	Salem
Feathers, Mabel	D. S.	Soph.	Corvallis
Feldman, Gus Lester	Com.	Soph.	Portland
Felton, Dannie Sherman	Com.	Fr.	Corvallis
Fendall, DeVere	Agri.	Fr.	Newberg
Fendall, Virgil	Agri.	Fr.	Newberg
Fenn, Donald	Agri.	Soph.	Lake George, N. Y.
Ferguson, Arthur	Agri.	Fr.	Helix
Ferguson, Oscar Earl	Agri.	Fr.	Helix
Fertig, Charles Arthur	M. E.	Fr.	Hood River
Fiedler, Frank D.	C. E.	Sr.	Bellingham, Wash.
Finch, Arthur William	Agri.	Fr.	Gardena, Calif.
Finch, Leslie	Phar.	First Yr.	Baker
Fisher, Lester George	Com.	Fr.	Hood River
Fisk, Carlos E.	Agri.	Soph.	Parma, Idaho
Fitts, Grace Elizabeth	D. S.	Soph.	Corvallis
Fitzgerald, Gerald	Agri.	Spec.	Portland
Flanagan, Charles Bartlett	Agri.	Jr.	Marshfield
Flanery, Floyd B.	Phar.	Soph.	Corvallis
Flegel, Charles P.	Agri.	Jr.	Portland
Fletcher, Allan Taylor	Com.	Jr.	Buell
Flint, John Walter	Agri.	Jr.	San Diego, Calif.
Flippin, Thomas J.	Agri.	Fr.	Rainier
Floss, Fritz Carl	Min.	Soph.	Milwaukie
Floydstead, Harry	Agri.	S. Sec.	Tacoma, Wash.
Foister, Robert Paul	Com.	Fr.	Pasco, Wash.
Follette, Peter Wilson	Agri.	Fr.	Nicholas, N. Y.
Forbis, John Franklin, Jr.	Agri.	Jr.	Dilley
Ford, Charles Edward	Com.	Jr.	Sheridan
Forster, F. H.	C. E.	Soph.	Tangent
Foster, Albert D.	Phar.	Soph.	Dayton
Foster, Harold Darwin	Agri.	Sr.	Seattle, Wash.
Foster, Harriett	D. S.	Fr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Foster, Verna	D. S.	Fr.	Baker
Foster, Warren Ralston	Agri.	Spec.	Independence
Foster, Will H.	E. E.	Sr.	Corvallis
Fowler, Robert G.	Agri.	Jr.	Portland
Fox, Kenneth Lawrence	Min.	Soph.	Portland
Fraley, Earl	Com.	Jr.	Ashland
Francis, George Leslie	Agri.	Soph.	Portland
Frank, Arthur	Agri.	Sr.	South Bend, Ind.
Frank, Herbert W.	Agri.	Soph.	Valley City, Ohio
Franz, Earl Alfred, Jr.	Com.	Spec.	Hood River
Fraser, John Henry	C. E.	Soph.	Parkplace
Freeman, Addice Loraine	D. S.	Soph.	Hood River
French, Phoebe Caroline	D. S.	S. Sec.	Corvallis
Freydig, Paul E.	For.	Sr.	Sutherlin
Frick, Robert B.	For.	Soph.	Presidio, Calif.
Friday, Roberta	D. S.	Jr.	Hood River
Fridley, Callie	D. S.	Fr.	Wasco
Fridley, Dora	D. S.	Soph.	Klondike
Fridley, Nettie M.	D. S.	Fr.	Klondike
Frost, Carl Magnus	E. E.	Soph.	Portland
Fryer, Carl Augustus	Phar.	Jr.	Shaw
Funk, Arnold John	Com.	Soph.	Corvallis
Funk, Arthur Louis	Agri.	F. Sec.	Oregon City
Funk, Maud	D. S.	Fr.	Etna Mills, Calif.
Gaines, Clarence	Agri.	Fr.	Stockton, Calif.
Gall, Erskine Meade	Agri.	Soph.	Santa Ana, Calif.
Gambée, Hosmer C.	Agri.	Sr.	Corvallis
Gambée, Louis Phaon	Agri.	Sr.	Corvallis
Garber, Hazel	D. S.	Fr.	Nampa, Idaho
Garbutt, E. Edward	M. E.	Fr.	Sheridan, Wyo.
Gardiner, William Benson	Agri.	Sr.	Colorado Springs, Colo.
Gates, Pearl Imogene	D. S.	Soph.	Corvallis
Gaylord, Clarence Clyde	Phar.	Jr.	Baker
Gentner, Louis G. O.	Agri.	Jr.	Portland
Gentry, Eva Lenore	Opt.		Portland
Gerdes, Lawrence Marion	Opt.		Hood River
Gerke, Walter Henry	Agri.	Soph.	Portland
Giguet, George J.	Agri.	Spec.	Pasadena, Calif.
Gilbert, Henry C.	Agri.	Jr.	Salem
Gilbert, Lovina	D. S.	S. Sec.	Portland
Gilbert, Mahlon Bruce	Agri.	Jr.	Woodburn
Gildner, Walter Fred	E. E.	Jr.	Astoria
Gillette, Mina E.	D. S.	Spec.	Claremont, Calif.
Gillmore, John Emery	Phar.	First Yr.	St. Johns
Glaser, Elizabeth	D. S.	Jr.	Lebanon
Glines, Halcie Williford	Agri.	Soph.	Waldport
Goble, Ray E.	Agri.	Jr.	Ferndale, Calif.
Godel, Howard	Agri.	F. Sec.	Portland

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Godfrey, Gaylord Gerald	Phar.	Sr.	Oregon City
Godfrey, Lena	D. S.	Jr.	Portland
Goffe, Cordelia	D. S.	Sr.	Medford
Golden, John Justus	M. A.	S. Sec.	LaGrande
Golden, Zoa	D. S.	Fr.	LaGrande
Goodale, Frank W.	M. E.	Fr.	Medford
Gooding, Joseph Hunter, Jr.	Agri.	Sr.	Wilmington, Del.
Goodbrod, Adrian	Agri.	Fr.	Union
Goodrich, Lee Jesse	Agri.	Spec.	Seattle, Wash.
Gould, Beatrice Marie	Opt.		Hood River
Graf, Herman	M. E.	Soph.	Portland
Gragg, George Merle	Agri.	Fr.	Monroe
Graham, Aubrey Gifford	M. E.	Fr.	Pendleton
Grasle, Wesley Reed	E. E.	Jr.	Milwaukie
Graybeal, Carlyle West	Agri.	Fr.	Snohomish, Wash.
Green, Carl Clifford	Agri.	Fr.	Parkdale
Green, Dorr Dudley	Agri.	Fr.	Parkdale
Green, John Wesley	C. E.	Soph.	Suver
Greene, Killaly	Agri.	Fr.	Aberdeen, Wash.
Greenlee, James	Agri.	S. Sec.	Portland
Greer, Medora	D. S.	Fr.	Dundee
Gregg, Rodney	M. A.	S. Sec.	Gazelle, Calif.
Grimes, Etta	D. S.	Fr.	Portland
Grubbe, Eugene Erle	Com.	S. Sec.	Elkton
Grubbe, Vernet Garland	Com.	F. Sec.	Elkton
Guha, Dakshina K.	M. E.	Soph.	Dasca, India
Hackett, Harold Nelson	E. E.	Soph.	Elgin
Hadrys, Frank V.	E. E.	Jr.	Portland
Hagey, Grover Adel	Phar.	First Yr.	Sherwood
Hale, Oscar George	Com.	Fr.	Spray
Hall, Eldora	Com.	Fr.	Burns
Hall, Mildred	D. S.	Jr.	Corvallis
Hamilton, Edith A.	Opt.		Corvallis
Hamilton, Harry E.	M. E.	Soph.	Portland
Hamilton, John Monroe	Agri.	Fr.	National City, Calif.
Hamilton, Wm. D.	Phar.	First Yr.	LaGrande
Hammer, Leetta Fay	Opt.		Corvallis
Hammerly, Hugh Fisher	Phar.	Fr.	Albany
Hammersley, Ray Roy	M. E.	Sr.	Corvallis
Hammond, Helen Hunt	Opt.		Portland
Hammond, Louise	D. S.	Fr.	Portland
Hampton, Lester	Agri.	Fr.	Randle, Wash.
Hansen, Beneta Kareen	D. S.	Jr.	Corvallis
Hanson, Jettie Marie	D. S.	Sr.	Corvallis
Hansen, Laura	D. S.	Spec.	Portland
Hanson, Manette	D. S.	Fr.	Corvallis
Hanson, Margaret	Com.	Jr.	Corvallis
Hanthorn, Faith	D. S.	Fr.	Portland

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Happold, Louis	M. A.	S. Sec.	Klondike
Harding, George Edwin	Agri.	F. Sec.	Barton
Hardman, Florence Rozelle	Opt.		Corvallis
Hardman, George	Agri.	Jr.	Ontario
Hardman, Sylvia A.	D. S.	Jr.	Portland
Hare, Bruce	For.	S. Sec.	Tillamook
Harlow, Charles N.	E. E.	Soph.	Cottage Grove
Harmon, William L. Jr.	Agri.	Fr.	Portland
Harrah, Martin Aaron	Agri.	Fr.	Freewater
Harriman, Arthur Absalom	Com.	Jr.	The Dalles
Harriman, Edna Cornelius	Com.	Jr.	The Dalles
Harriman, Fred Edward	Com.	Fr.	Corvallis
Harriman, Nellie Hanford	Com.	Jr.	The Dalles
Harris, Earl Sorsby	Com.	Jr.	Corvallis
Harris, Emma Gertrude	D. S.	Soph.	Vale
Harris, Milton	C. E.	Fr.	Portland
Harrison, M. Allen	Agri.	Soph.	Brownsville
Harritt, Jessie	D. S.	Jr.	Salem
Harry, Earl Logan	M. E.	Sr.	Corvallis
Harry, Olive M.	Phar.	Sr.	Corvallis
Hart, Martha	D. S.	Fr.	Portland
Hart, Otho Clement	M. E.	Soph.	Corvallis
Hartley, Edwin A.	For.	Fr.	Mapleton
Hartung, Esther	D. S.	Sr.	Eugene
Hartzog, Delphia Mary	D. S.	Soph.	Corvallis
Harvey, Corwin Satterthwaite	Com.	Soph.	Milwaukie
Harvey, Guysbert	For.	Fr.	Grants Pass
Harvey, Paul A.	Agri.	Fr.	St. Maries, Idaho
Harvey, Ruth	D. S.	Fr.	St. Maries, Idaho
Hathaway, Marcus Francis	Agri.	Soph.	Corvallis
Hauser, Salomon Wm.	Agri.	S. Sec.	Tygh Valley
Haverstick, Russell N.	Agri.	Fr.	Cashmere, Wash.
Haw, Horace Leo	Agri.	Jr.	Pendleton
Hawley, Mary W.	Com.	Jr.	Corvallis
Hawley, Ruth Blanche	Com.	Sr.	Blodgett
Hawley, Willa	D. S.	Jr.	Corvallis
Hawver, Samuel Wm.	Agri.	Soph.	Los Angeles, Calif.
Hay, William Chalmers	Com.	S. Sec.	Lihue, Hawaii
Hayes, Frank Arthur	Agri.	Fr.	Pasadena, Calif.
Hayes, Lucile	D. S.	Fr.	Portland
Hayes, Marshall C. Jr.	For.	Sr.	Pasadena, Calif.
Hayes, Oliver Bliss	Agri.	Jr.	Pasadena, Calif.
Haynes, Dorothy	D. S.	Fr.	Springfield
Heath, Laura	D. S.	Jr.	Corvallis
Heaward, Robert E.	Com.	Fr.	Portland
Heidel, Wilma	Opt.		Hillsboro
Heminger, Norris Lyle	For.	F. Sec.	Parsley
Heminger, Willard	For.	Fr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Henderson, Charles A.	Agri.	Soph.	Gardiner
Henderson, Ruth	D. S.	S. Sec.	St. Johns
Henderson, Wright	Agri.	Fr.	Honolulu, Hawaii
Hendricks, Bertha	D. S.	Jr.	Silverwood, Mich.
Hester, Curtis Sherman	Opt.		Indianapolis, Ind.
Hewes, Cora	D. S.	Fr.	Albany
Hewett, Henry	Agri.	Sec. Yr.	Milton
Hewitt, Harry Nutting	Phar.	Soph.	Portland
Hewitt, Marion Samuel	M. E.	Jr.	Stockton, Calif.
Heywood, Herbert Joseph	M. E.	Soph.	Portland
Hiestand, Clynton H.	Phar.	Fr.	Corvallis
Hiestand, Zula Helen	Com.	Fr.	Corvallis
Hill, Charles Edwin	Agri.	Jr.	Springfield, Mass.
Hill, Charles Lester	Agri.	Sr.	Warrenton
Hill, Ruth	D. S.	Jr.	Eugene
Hinds, Ralph Hubert	Agri.	Spec.	Philomath
Hinton, Richard Bird	M. A.	F. Sec.	Shaniko
Hirst, Bernard	Agri.	Soph.	Sitka, Alaska
Hirst, Percy V.	Agri.	Fr.	Sitka, Alaska
Hitt, Abe	Agri.	Fr.	Emmett, Idaho
Hittson, Carmen	Phar.	Jr.	Medford
Hobgood, Guy	Agri.	Jr.	Madisonville, Ky.
Hoerner, Godfrey Richard	Agri.	Soph.	Seattle, Wash.
Hoerr, Carl Gerlich	M. E.	Soph.	Lebanon
Hofer, Marie Annette	D. S.	Sr.	Salem
Hofer, Paul Ballon	Agri.	Soph.	Salem
Hoff, Melvin Rutherford	Agri.	Sr.	Portland
Hoff, Norlyn Paul	Phar.	Soph.	Salem
Hoffman, Leota	D. S.	Fr.	Whiteson
Hoflich, Neva	D. S.	Fr.	Albany
Hogg, John Ashton	M. E.	Soph.	Lihue, Hawaii
Holboke, Sophia Marie	Opt.		Portland
Holdren, Homer	Agri.	Fr.	Gladstone
Holland, Gladys Glenn	Com.	Fr.	Corvallis
Hollenberg, Leo D.	Agri.	Fr.	Burns
Hollingworth, Gertrude	D. S.	Fr.	Newberg
Holloway, Daphne Mae	D. S.	Fr.	Portland
Hollowell, Garland E.	Agri.	Spec.	Milwaukie
Holmes, Elise	D. S.	Jr.	Enterprise
Holmes, Frederick Aram	Agri.	Jr.	Enterprise
Holmes, Juana	D. S.	Fr.	Portland
Holt, Ada	D. S.	Fr.	Corvallis
Holt, Hazel	D. S.	Sr.	Corvallis
Hooper, John Amos	E. E.	Fr.	Corvallis
Hoover, Fenton Whitman	C. E.	Fr.	Portland
Hopkins, Geo. Evans	C. E.	Jr.	Corvallis
Horning, Benj. F.	Phar.	Sr.	Otter Rocks
Horning, Emil Edwin	Com.	Sr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Horning, Helen	D. S.	Soph.	Corvallis
Horobin, Walter Leo	Agri.	Sr.	Cornwall-on-Hudson, N. Y.
Hosford, Edwin Frederick	C. E.	Soph.	Stayton
Houck, Roy Lester	E. E.	Fr.	McMinnville
Houliston, George McLean	Agri.	Soph.	East Aurora, N. Y.
Howard, D. C.	Agri.	Sr.	Corvallis
Howard, Russell Marion	Com.	Sr.	Corvallis
Howard, Walter William	Agri.	Sr.	Corvallis
Howe, George B.	For.	Fr.	Lents
Howell, Herbert Badolett	Agri.	Fr.	Portland
Howey, Iva	D. S.	Fr.	Coquille
Howitt, Elizabeth	D. S.	Fr.	Gresham
Hubbard, Chauncey Mulka	Agri.	Fr.	Corvallis
Hubbard, Harry Lee	C. E.	Jr.	Amity
Hubbard, Walter P.	Agri.	Fr.	Corvallis
Hubbard, Winfield	Agri.	Fr.	Corvallis
Hughes, Clifton	Agri.	Fr.	Stevenson, Wash.
Hukill, Brooke	Agri.	Sr.	Corvallis
Hull, Harry Stephen	Com.	Fr.	Grants Pass
Hult, Mrs. Ellen	Opt.		Corvallis
Hult, Gustaf W.	For.	Soph.	Corvallis
Humason, Harvey	M. A.	F. Sec.	Portland
Humason, Mattie	D. S.	Spec.	Spokane, Wash.
Humphrey, Esther	D. S.	Fr.	Eugene
Huntley, Floyd J.	Com.	Fr.	Gold Beach
Hurley, Alton D.	Agri.	Soph.	Seattle, Wash.
Huss, Julia	D. S.	Fr.	McMinnville
Hutt, Lester	M. E.	Sr.	Yamhill
Hyde, Sara	D. S.	Spec.	Corvallis
Hyde, Walter Rob.	Phar.	Fr.	Portland
Hyams, Leo Klein	M. E.	Soph.	Portland
Ide, Russell Sanders	Agri.	Fr.	Portland
Imrie, Lillian Mildred	Opt.		Melrose
Ingels, Hollis Glen	C. E.	Fr.	Salem
Irving, Benjamin Barton	C. E.	Sr.	Corvallis
Irving, Iona	D. S.	Jr.	Corvallis
Irwin, Albert Hugh	Agri.	S. Sec.	Vanora
Irwin, Mary Louise	Opt.		Salem
Ito, Chonosuke	Com.	Fr.	Tokio, Japan
Jackson, Della M.	D. S.	Soph.	Lorane
Jackson, Eva	D. S.	Fr.	Portland
Jackson, Maud Gracia	Opt.		Lorane
Jacobson, Ernest	Agri.	Fr.	Newberg
Jacobson, Harry C.	Agri.	Spec.	San Francisco, Calif.
Jacoby, Carl C.	For.	S. Sec.	Toledo, Wash.
Jacoby, Fred	Agri.	F. Sec.	Toledo, Wash.
Jaeger, Harry D.	Agri.	S. Sec.	Portland
James, Oscar William	Ind. Arts	Jr.	Robinet

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Jamison, Dwight L.	Agri.	Jr.	Puyallup, Wash.
Jamison, Neal Clement	Agri.	Sr.	Corvallis
Janes, Marjorie	D. S.	Fr.	Portland
Jaye, Edith	D. S.	Fr.	Skamokawa, Wash.
Jeffers, Fred Marion	Agri.	Fr.	Portland
Jenkins, Merle Freeman	Agri.	Fr.	Portland
Jennings, D. V.	E. E.	Soph.	Sherwood
Jensen, Martha	Opt.	.....	Silverton
Jernstedt, Maurice	Agri.	Fr.	Carlton
Jessup, John Mercator	Agri.	Spec.	Cooks, Wash.
John, Morris	Com.	Soph.	Corvallis
Johns, Miles Shirk	Agri.	Soph.	Bellingham, Wash.
Johnson, Alfred Pullman	Agri.	Jr.	Enumclaw, Wash.
Johnson, Clarence Benjamin	Agri.	Fr.	Hermiston
Johnson, Carl Stewart	Agri.	Fr.	Portland
Johnson, George Ray	Agri.	Sr.	Cooston
Johnson, Gustaf	Agri.	F. Sec.	Boring
Johnson, J. Lewis	Agri.	Spec.	Eugene
Johnson, Lewis Ross	Agri.	Jr.	Bloomington, Ill
Johnson, Louis Merle	Com.	Fr.	Portland
Johnson, Lillian	D. S.	S. Sec.	Corvallis
Johnson, Owen H.	For.	Soph.	Quincy, Wash.
Johnson, Willard	For.	S. Sec.	Scappoose
Johnston, Perry Nolan	Agri.	Soph.	Moro
Johnston, Theodore	Agri.	Jr.	Moro
Johnston, William	Agri.	Fr.	Corvallis
Jonassen, Olaf	For.	Fr.	Davenport, Iowa
Jones, Charles D.	For.	S. Sec.	Portland
Jones, Edward Delta	M. E.	Soph.	Jefferson
Jones, Glenn C.	Phar.	First Yr.	Heppner
Jones, Leon	Agri.	Fr.	Antelope
Jones, Melville Seymour	Opt.	.....	Salem
Jonsrud, Albert E.	Agri.	F. Sec.	Boring
Jordan, Arthur	C. E.	Soph.	Pendleton
Jordan, Clifford	Agri.	Fr.	Pendleton
Jordan, Marvin	Com.	Spec.	Corvallis
Jordan, Melvin Harold	Com.	Jr.	Corvallis
Jory, Elmo Clayton	Agri.	Fr.	Salem
Joyce, Lula	Opt.	.....	Portland
Kadderly, Wallace	Agri.	Fr.	Portland
Kain, Corland Edward	E. E.	Fr.	Portland
Kabus, Minnie	D. S.	Fr.	Chehalis, Wash.
Kan, Frank Fan	Agri.	Soph.	Canton, China
Kathan, George Lewis	Agri.	Fr.	Syracuse, N. Y.
Kaufmann, Vera Marie	Opt.	.....	Portland
Keatley, Eva	D. S.	Fr.	Castlerock, Wash.
Keatley, Virginia	D. S.	Sr.	Castlerock, Wash.
Keen, Wm. Henry Harrison	M. A.	F. Sec.	Portland

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Kehrli, Frank Walter	Agri.	Sr.	Hillsdale
Kellar, Anna	D. S.	Sr.	Portland
Keller, Fred	Agri.	S. Sec.	Portland
Kelner, Rowan Burns	Agri.	Spec.	Portland
Keifner, Lucy Louise	Opt.		Logansport, Ind.
Kennedy, Rowe Davis	M. E.	Jr.	Corvallis
Kent, Nola	D. S.	Fr.	Drain
Kenton, Ralph M.	M. E.	Soph.	Albany
Kern, Winnifred	D. S.	Fr.	Jenning's Lodge
Kerr, Lynette	D. S.	Fr.	Corvallis
Ketchum, Beth	D. S.	Fr.	Independence
Ketchum, Jean	D. S.	Fr.	Independence
Keyser, Florence	D. S.	Fr.	Corvallis
Kilham, Oliver Frank	Agri.	Sr.	Beverly, Mass.
Kimberk, Irene	D. S.	Fr.	Monroe
Kimble, Loren	Com.	F. Sec.	Portland
Kinderman, W. C.	E. E.	Jr.	Hoskins
King, Charles Allen	E. E.	Jr.	Ashland
King, Winnifred	D. S.	Jr.	Corvallis
King, Luther Andrew	Ind. Arts	Jr.	Cottage Grove
King, Philip S.	Agri.	Fr.	Portland
King, Will O.	Agri.	Sr.	Eugene
Kingsley, Earl James	Com.	Soph.	Corvallis
Kinnison, Grace	D. S.	Fr.	Presidio, Calif.
Kirkpatrick, Kathreen	D. S.	Sr.	Pendleton
Kirry, Zola	D. S.	Fr.	Forest Grove
Kirtley, Naomi	D. S.	Fr.	LaGrande
Klinghammer, Reinhold M.	Ind. Arts	Jr.	Elgin
Knight, Florence	D. S.	Fr.	Port San Luis, Calif.
Knox, Leland Jay	Com.	Jr.	Fossil
Koenig, Walter	Opt.		Corvallis
Koepfel, Oliver	Agri.	F. Sec.	Delaware, Ohio
Koon, Harvey	Phar.	Spec.	Portland
Koons, Hubert E.	Agri.	Jr.	Orland, Calif.
Kroner, Leo	M. E.	Jr.	Portland
Kruger, Herbert W.	Min.	Fr.	Portland
Kuhnhausen, Arnold E.	E. E.	Sr.	Portland
Kuks, Anna	D. S.	Fr.	Milwaukie
Kunzmann, Carl Frederick	Agri.	F. Sec.	Bow, Wash.
Kurtz, Harry L.	Phar.	Soph.	Rainier
Lafky, Ernest Herman	Agri.	Jr.	Salem
Laird, Ralph P.	Agri.	Soph.	Pleasant Hill
Laird, Thomas	Phar.	Soph.	Bandon
Lake, Emery Dudley	Agri.	Jr.	Eugene
Lall, Shiam	Opt.		Ry. Str. Gwalior, India
Lamb, Howard	Agri.	Spec.	Fossil
Lamb, Stewart Frank	Agri.	Fr.	Albany
Lamley, Harry Bernette	Min.	Jr.	Portland

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Lamoreux, Louis	For.	Soph.	Ft. Baker, Calif.
Lamoreux, Thomas Liggett	Agri.	Soph.	San Francisco, Calif.
Lance, Mayme	D. S.	Sr.	Corvallis
Lance, Neely Samuel	Agri.	Fr.	Corvallis
Landreau, Catherine	D. S.	F. Sec.	Warm Springs
Lane, Dorothy	D. S.	Fr.	Corvallis
Lane, Vivian	D. S.	Soph.	Harrisburg
Lange, Alfred J.	M. E.	Jr.	Portland
Lansdale, Lane Arthur	C. E.	Soph.	Weston
Lantz, Harvey Lee	Agri.	Soph.	Cove
Larson, Adolph Leonard	Agri.	Jr.	Astoria
Larson, Carl Julius	M. E.	Fr.	Marshfield
Larsen, Walter Winfred	C. E.	Sr.	Laurel
Laskar, Adhar, Chandra	E. E.	Soph.	Calcutta, India
Lasswell, Avery Lloyd	Com.	Soph.	Portland
Lasswell, Sydney Smith	Agri.	Fr.	Portland
Lawrence, Sylvester Ernest	Agri.	Spec.	Portland
Laythe, Leo L.	Agri.	Soph.	Harriman
Lee, Bernice A.	D. S.	Fr.	Portland
Lee, Earl Francis	Com.	Spec.	Eugene
Leekun, Yukon George	Com.	Fr.	Victoria, B. C.
Leeper, Enid Glenda	Com.	Jr.	Corvallis
Legg, Gladys	D. S.	Fr.	Portland
Leibner, Emil C. W.	Agri.	F. Sec.	Albany
Lentz, Glen Allen	M. E.	Fr.	Parkdale
Letellier, George H., Jr.	E. E.	Fr.	Mill City
Levage, Harry V.	Agri.	Fr.	Florence
Levengood, Alma Mae	Com.	Jr.	Athol, Kan.
Levengood, Frank	Com.	Soph.	Athol, Kan.
Leweaux, Victor	Phar.	Jr.	Corvallis
Lewis, Dolorosa	D. S.	S. Sec.	Smith River, Calif.
Lewis, Elizabeth Thurman	D. S.	Sr.	Pacific Grove, Calif.
Lewis, Eugene Davis	Agri.	Fr.	Hood River
Liddle, Mrs. Edith Dunn	Opt.		Corvallis
Liles, Virgil	Agri.	Fr.	Crow
Lindeman, Laird N.	Agri.	Fr.	Corvallis
Linguist, Herman Andrew	M. A.	F. Sec.	Cathlamet, Wash.
Lindquist, Eric Arthur	M. A.	F. Sec.	New Hazelton, B. C.
Lindsay, Alexander Lewis	Agri.	Soph.	Hilo, Hawaii
Lindsley, Sterling L.	M. E.	Soph.	Portland
Locher, Leonard	M. E.	Sr.	Burns
Logan, Arthur Evan	Com.	Soph.	Escondido, Calif.
Loken, Edward Benjamin	C. E.	Soph.	Harrisburg
Long, Howard Allen	Com.	Fr.	Portland
Long, Yick	Com.	Jr.	Canton, China
Loof, Hans Walter	For.	Soph.	Oak Harbor, Wash.
Loosley, Claude Frederick	Agri.	Jr.	Ft. Klamath
Lorence, Ruby Anne	Opt.		Monmouth

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Lorenz, Ralph Childs	For.	Spec.	Cove
Loughary, Elithe	D. S.	S. Sec.	Monmouth
Loughary, Ivan Hill	Agri.	Soph.	Monmouth
Love, Annis	D. S.	Fr.	Junction City
Lowell, Arthur	Agri.	Fr.	Wasco
Lowry, Ralph William	Agri.	Fr.	Corvallis
Lucas, Fred A.	Com.	Soph.	Bend
Lundeen, Arthur Robt.	For.	Soph.	Rock Island, Ill.
Lutz, Arthur Wm.	Agri.	Fr.	Santa Ana, Calif.
Luxton, William Lee	Com.	Spec.	Idaho Falls, Idaho
Lyon, Helen Louise	D. S.	Soph.	Corvallis
Lyster, Kathleen	D. S.	Jr.	Corvallis
McCabe, Fred	C. E.	Soph.	Portland
McCafferty, Tommie Lee	D. S.	Spec.	Nampa, Idaho
McClaran, Joe Wallace	Com.	Jr.	Wallowa
McClellan, Thomas R.	Agri.	Soph.	Turner
McCollum, Charles	For.	Fr.	Salinas, Calif.
McCollum, John E.	For.	Fr.	Salinas, Calif.
McCord, George	Phar.	First Yr.	Baker
McCormick, Andrew Cameron	Agri.	Sr.	Lebanon
McCormick, Anna	D. S.	Fr.	Lebanon
McCormick, Harl Craig	Opt.		Drain
McCown, Cordelia	Opt.		Corvallis
McCurdy, Ellen	D. S.	Fr.	Hood River
McDermott, Katharine	D. S.	Jr.	Portland
McDermott, Mary	D. S.	Jr.	Portland
McDonald, Allie M.	D. S.	Jr.	Corvallis
McFadden, Curran Lane	Phar.	Jr.	Corvallis
McGeorge, William	C. E.	Fr.	Stillwater, Okla.
McGinnis, James Luther	Agri.	Jr.	Corvallis
McGogy, Donald H.	E. E.	Fr.	McMinnville
McHenry, Bertha Isabelle	Opt.		Corvallis
McHenry, Muriel Esther	Com.	Fr.	Corvallis
McIntosh, Fern	Opt.		Union
McKay, James Douglas	M. A.	S. Sec.	Portland
McKee, Hazel Adelia	D. S.	Sr.	Lakeview
McKinney, Loette Virginia	Com.	Soph.	Waitsburg, Wash.
McLean, William Donald	Com.	Soph.	Kakabeka Falls, Ont.
McMaster, Cedric Stuart	Agri.	S. Sec.	Pomona, Calif.
McMillan, Donna	D. S.	Fr.	Garibaldi
McMinn, Ray Ben	M. E.	Fr.	Portland
McNamee, George Paul	M. E.	Fr.	Portland
McQuaid, Zena	D. S.	Soph.	Portland
McRayde, Donald William	Agri.	Fr.	Corvallis
McVey, Jacob A.	M. A.	S. Sec.	Harrisburg
Mackenzie, Ronald Seaforth	Agri.	Spec.	Portland
Macpherson, Wm. M.	Agri.	Jr.	Pasadena, Calif.
Magness, John Robert	Agri.	Sr.	Amity

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Mahoney, Grace	D. S.	Fr.	Gervais
Mallett, Ernest Alfred	Agri.	S. Sec.	Portland
Mangold, Alfred Oscar	E. E.	Sr.	Portland
Manners, Charles Haddon	Agri.	Jr.	Montclair, N. J.
Manning, Kenneth C.	Agri.	Soph.	Los Angeles, Calif.
Manock, Nathan Edwin	Phar.	Fr.	Corvallis
Manuel, Mildred	D. S.	Fr.	Oakland, Calif.
Manula, Wayne Erik	E. E.	Soph.	Astoria
Marcks, Raymond Arthur	Agri.	Soph.	Corvallis
Markham, Arthur Gordon	Agri.	Soph.	Portland
Martin, John Holmes	Agri.	Sr.	Corvallis
Martin, Melissa Margaret	D. S.	Jr.	Corvallis
Martin, Porter Wilson	M. E.	Fr.	Corvallis
Marvin, Julia O.	D. S.	Jr.	Enterprise
Mason, Albert Freeman	Agri.	Sr.	Pasadena, Calif.
Mason, Joy	Com.	Sr.	Hood River
Mason, Harold	E. E.	Soph.	Ione
Mason, Rose Coffman	Phar.	Sr.	Jefferson
Mateer, Marion	D. S.	Fr.	Nampa, Idaho
Mather, Arthur Gilmore	Min.	Jr.	Clackamas
Mathews, Helen	Com.	Fr.	Portland
Mattson, Marshall	Com.	Spec.	Astoria
May, Thomas Everett	Com.	Sr.	Grass Valley
Mayhew, Spencer	Agri.	Fr.	Joseph
Meek, Margaret	D. S.	Fr.	Oakland, Calif.
Mehl, Paul	Agri.	Jr.	Chicago, Ill.
Mentzer, Lottie	D. S.	Sr.	Pendleton
Mercer, Frank B.	Phar.	Sec. Yr.	North Powder
Mercer, Grover C.	Phar.	Sec. Yr.	North Powder
Mercer, Helen B.	D. S.	Fr.	Salem
Merriman, Merritt B.	Agri.	Fr.	Medford
Merritt, Ina Gertrude	Com.	Spec.	Corvallis
Metzger, Floyd Sanford	Com.	Spec.	Gresham
Metzler, Ethel May	D. S.	Sr.	Corvallis
Meyers, Cornelius W.	Min.	Fr.	Portland
Meyers, J. Donald	Com.	Jr.	Salem
Michael, Edith M.	Opt.		Urbana, Ohio
Michaelbook, Roy P.	M. E.	Soph.	McMinnville
Middlekauff, Donald G.	Agri.	Fr.	Lewiston, Idaho
Middlekauff, Harold B.	Agri.	Fr.	Lewiston, Idaho
Middlekauff, Mark Humbert	Agri.	Soph.	Corvallis
Middlestadt, John F.	Agri.	Fr.	Crabtree
Milam, Lottie	D. S.	Sr.	Macon, Mo.
Miles, Frank	Com.	S. Sec.	Evans
Miller, Alice	Com.	Spec.	Corvallis
Miller, Carl N.	For.	Sr.	Indianapolis, Ind.
Miller, Eva	D. S.	Fr.	Fillmore, Ill.
Miller, Fred Merle	M. E.	Sr.	Albany

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Miller, Harry Dale	Agri.	S. Sec.	Corvallis
Miller, Harvey	Min.	Fr.	Lexington
Miller, Helen	D. S.	Fr.	Corvallis
Miller, Julia B.	D. S.	Jr.	Amity
Miller, Leo Waldemar	E. E.	Fr.	Portland
Miller, Loraine	D. S.	Sr.	Portland
Miller, Roy Edmund	Agri.	Jr.	Spokane, Wash.
Millikin, Damon E.	Agri.	Soph.	Ontario
Millikin, Stanley John	For.	Jr.	Ontario
Mills, Edna Lola	D. S.	Jr.	Forest Grove
Mills, Harold M.	Min.	Fr.	Corvallis
Minsinger, David William	Com.	Soph.	Portland
Mitchell, Grace E.	D. S.	Jr.	Medford
Mix, Ira	Com.	Fr.	Independence
Moe, Forrest Lester	Agri.	Jr.	Hood River
Moist, Charles Morgan	Com.	Fr.	Lebanon
Monger, Walter Victor	E. E.	Soph.	Parkplace
Moore, Carroll Lester	C. E.	Fr.	Sparta, Ill.
Moore, Frank W.	Com.	Spec.	Newberg
Moore, Jesse W.	Agri.	Jr.	Harrisburg
Moore, Leland Bernard	Agri.	Fr.	Gresham
Moore, Merle	M. E.	Jr.	Corvallis
Moore, Willetta	D. S.	Fr.	Eugene
Moore, Wm. Tracy	C. E.	Sr.	Oak Grove
Moreland, Julius C.	Min.	Soph.	Portland
Morfitt, Neil Lewis	Min.	Fr.	Baker
Morgan, Beulah	D. S.	Fr.	Corvallis
Morgan, Ralph	Agri.	Fr.	Corvallis
Morgan, Victor	Agri.	Fr.	Edenbower
Morgan, Walter John	Agri.	Fr.	Portland
Morgan, Annes	D. S.	F. Sec.	Roseburg
Morris, Sarah	D. S.	Jr.	Rainier
Morrison, Eugene Franklin	Agri.	S. Sec.	Williams
Morse, John J.	Agri.	Sr.	San Francisco, Calif.
Morse, Wilmetta	D. S.	Fr.	West Lafayette, Ind.
Mosby, David Clayborn	C. E.	Soph.	Cottage Grove
Moses, Everett A.	Com.	Spec.	Portland
Motley, Jesse William	Ind. Arts	Jr.	Cove
Motz, Frederick Allen	Agri.	Fr.	Rock Island, Ill.
Moznette, George Franklin	Agri.	Sr.	Vancouver, Wash.
Muck, John Edgar	M. E.	Jr.	St. Johns
Mudd, Vivian	D. S.	S. Sec.	Hammond
Mulkey, Oren	E. E.	Soph.	Myrtle Creek
Mumpower, Genevieve Ruth	Opt.		Clackamas
Munford, Ruby	D. S.	Fr.	Vancouver, Wash.
Murch, George S.	E. E.	Soph.	Marshfield
Murneek, Andrew E.	Agri.	Fr.	Talsen, Russia
Murphy, Clara May	D. S.	Fr.	Portland

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Murphy, Donald Ridgway	Agri.	Fr.	Des Moines, Iowa
Murphy, Foster McKinley	Agri.	Jr.	Evanston, Ill.
Murphy, Lester L.	Phar.	Fr.	Hood River
Myers, Clarence W.	Agri.	Soph.	Moneta, Calif.
Myers, Francis Parker	M. E.	Fr.	Corvallis
Naito, Tadasu	Agri.	Soph.	Tokyo, Japan
Nash, Jack Walker,	C. E.	Soph.	Albany
Neale, Aubrey R.	Agri.	Jr.	Willow Point, B. C.
Neale, Eric W.	For.	Soph.	Willow Point, B. C.
Neer, Francis Edwards	Agri.	Sr.	Pasadena, Calif.
Needham, Ray Albert	Agri.	Sr.	Tracy, Calif.
Nehl, Helen Elizabeth	Agri.	Spec.	Woodburn
Neill, Angeline	D. S.	Fr.	Ashland
Nelson, Kenneth	Agri.	Sr.	Eugene
Nelson, Willard Y.	C. E.	Soph.	Lafayette
Nesbit, William Frazier	Agri.	Fr.	Pomona, Calif.
Newell, Joseph Webster	Agri.	Fr.	Portland
Newins, Geraldine	D. S.	Soph.	Patchogue, N. Y.
Newmeyer, Ruth	D. S.	Soph.	Salem
Nichols, Rudolph	Phar.	Fr.	Corvallis
Nichols, Tressa Elizabeth	Opt.		Corvallis
Nicholson, Ray	Agri.	Sr.	Hood River
Nicolay, Harold	Agri.	Fr.	Seattle, Wash.
Niederer, Carl Emil	M. E.	Sr.	Summerville
Nitsos, Nicholas D.	Agri.	Fr.	Patras, Greece
Nixon, Clara M.	Agri.	Sr.	Trumansburg, N. Y.
Nobel, Milton George	M. E.	Fr.	Oregon City
Nolan, Edward Victor	Com.	Fr.	Corvallis
Nordling, David N.	M. E.	Fr.	Mulino
Noren, Carl Albin	Agri.	Sr.	Reedley, Calif.
Norgren, Olga Otelia	Opt.		Vancouver, Wash.
Norris, William Thomas	Agri.	Fr.	Ft. Klamath
Norton, James Emmet	Com.	Sr.	Airlie
Norton, Lola	D. S.	Fr.	Corvallis
Norton, Mabel M.	D. S.	Fr.	Corvallis
Norton, Walter Bert	Agri.	Fr.	Corvallis
Norton, Wenny Leonard	Agri.	Fr.	Corvallis
Nott, Edwin Sylvester	Com.	Fr.	Ilwaco, Wash.
Oakes, Mary	D. S.	Soph.	Grants Pass
Oberdorfer, Harold	Com.	Soph.	Portland
Odeen, Henry	C. E.	Sr.	Portland
Olcott, Wiley Herbert	E. E.	Soph.	Canyonville
Olmsted, Aaron Lemuel	Agri.	Sr.	Enterprise
Olmsted, Irl Louis	E. E.	Jr.	Enterprise
Olsen, Jens	Agri.	Jr.	Milwaukie
Olsen, Ruby Irene	Com.	Spec.	Corvallis
O'Neil, William James	For.	Fr.	Chippewa Falls, Wis.
Ono, Robert Tokiro	Agri.	Fr.	Oakland, Calif.

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Orem, Elsie	D. S.	Fr.	Klamath Falls
Orford, Christine	D. S.	Sr.	DeLamar, Idaho
Ostien, Tom L.	For.	Fr.	Monmouth
Otis, Laurene	D. S.	Spec.	Newberg
Otis, Ralph Gray	Agri.	Soph.	Newberg
Overholser, Leroy Leighton	Com.	Soph.	Albany
Overton, James	M. A.	S. Sec.	Astoria
Padgham, Henry Irving	Agri.	Sr.	Santa Ana, Calif.
Paeschke, Ernest Edgar	Com.	F. Sec.	Junction City
Page, Charles Culver	Opt.		Crookston, Minn.
Paine, Edward Allen	E. E.	Fr.	Portland
Paine, J. Howard	Agri.	Jr.	Portland
Palmer, Emmet Nathan	Agri.	Sr.	Central Point
Parcel, Albert	Phar.	Soph.	Corvallis
Parcel, Roscoe Abraham	Opt.		Corvallis
Parelius, Ethel	D. S.	Spec.	Portland
Parker, Lorene	D. S.	Jr.	Salem
Farpala, Taimie Armas	Agri.	Fr.	Nasel, Wash.
Parr, Fern	D. S.	Fr.	Woodburn
Parrish, Fairfax Hayes	M. E.	Jr.	Roseburg
Parrish, Philip	Agri.	Fr.	Kawanee, Ill.
Parrish, Robert Arthur	Agri.	Fr.	Kawanee, Ill.
Parsley, Vineta	D. S.	S. Sec.	Riddles
Partin, Rae	D. S.	F. Sec.	Summer Lake
Passmore, Dorothy	D. S.	Fr.	Tualatin
Pathik, Sohandal	Opt.		Patti, India
Paton, Bernadetta	D. S.	Fr.	Sutherlin
Patterson, Winifred	D. S.	Jr.	Corvallis
Patton, Harry Clifford	For.	Fr.	Macleay
Paulsen, Edward M.	For.	Soph.	Portland
Payne, Nola	D. S.	Sr.	Woodburn
Payne, Richard Raymond	Agri.	Fr.	McMinnville
Peabody, Natalie	Opt.		Castlerock, Wash.
Pearcy, Harry Leland	Agri.	Soph.	Portland
Pearson, Roderic	C. E.	Soph.	Portland
Pechin, William G.	Com.	Fr.	Forest Grove
Peck, Robert	For.	S. Sec.	Redlands, Calif.
Peery, Wilson Kimsey	Agri.	Sr.	Dayton
Pelland, Gerald	E. E.	Jr.	Corvallis
Peninger, Mary A.	Com.	Soph.	Medford
Peterson, Carl Edward	E. E.	Fr.	Portland
Peterson, Fred O.	Agri.	Soph.	Bard, Calif.
Peterson, Inez M.	D. S.	F. Sec.	Mist
Peterson, Ira H.	Agri.	F. Sec.	Mist
Peterson, Nels Theodore	Agri.	Spec.	North Bend
Pettibone, Dwight Crockett	Agri.	Fr.	Bellingham, Wash.
Phetteplace, Edwin Erastus	E. E.	Fr.	The Dalles
Philippi, Leora	D. S.	Jr.	Early

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Piatt, Mildred Elizabeth	D. S.	Soph.	Berkeley, Calif.
Pierce, Loyd Byran	Agri.	Fr.	La Grande
Pietzker, Henry F.	E. E.	Fr.	Portland
Pilkingtion, John Clarke	Opt.		Portland
Pimm, Charles	M. E.	Fr.	Corvallis
Pinckney, Dunbar,	Agri.	Fr.	Aberdeen, Wash.
Pinn, Fred E.	E. E.	Soph.	White Salmon, Wash.
Piper, Dean	E. E.	Fr.	Myrtle Creek
Pirtle, Mary Louise	Opt.		Albany
Pitman, John Elijah	Agri.	Fr.	Moneta, Calif.
Plank, Esther	D. S.	Fr.	Woodburn
Platt, Dwight Gilbert, Jr.	M. E.	Fr.	Idaho Falls, Idaho
Plue, Vilas Leone	Com.	Fr.	Rainier
Polk, Clifford G.	C. E.	Jr.	Corvallis
Porter, Clifford	M. E.	Fr.	Hood River
Porter, Harry Baxter	M. E.	Soph.	Corvallis
Post, Clara Olga	Com.	Fr.	Blachly
Post, Elmer Oren	Agri.	Fr.	Blachly
Potter, Genevieve	D. S.	Fr.	Salem
Poulson, Charles Norris	Agri.	Fr.	Baker
Powell, Charles Kelly	Agri.	Soph.	Payette, Idaho
Powell, Frank Braxton	Agri.	Fr.	Monmouth
Powell, Walter Irving	Com.	F. Sec.	Bellingham, Wash.
Powell, Wilmer Dwight	Agri.	Fr.	Monmouth
Powell, Wm. Lester	For.	Soph.	Azusa, Calif.
Powers, Fred C.	Opt.		Oakland
Prentice, Hubert Spencer	M. A.	S. Sec.	Madison, Ohio
Pribble, Roland Carson	M. E.	Soph.	Portland
Price, Lloyd D.	M. E.	Jr.	Scappoose
Price, Raymond Eugene	Phar.	Fr.	Corvallis
Prill, Alice	D. S.	Fr.	Corvallis
Prill, Arabella	Opt.		Corvallis
Prill, George	Phar.	Fr.	Corvallis
Prindle, Roy	E. E.	Fr.	Payette, Idaho
Proebstel, John	Agri.	F. Sec.	Corvallis
Pugh, James Elza	Com.	Soph.	Corvallis
Raber, Clifford Wayne	Com.	Soph.	Corvallis
Raber, Morris Lester	Com.	F. Sec.	Corvallis
Rackleff, Sylvia Lee	Com.	Fr.	Myrtle Point
Ralston, Ella	Com.	Spec.	Corvallis
Ramsdell, George V. J.	Agri.	Fr.	Portland
Rand, Earl	Agri.	Fr.	Irrigon
Rasmussen, Gordon	Com.	Sr.	Marshfield
Ratliff, Elsie	Com.	Fr.	Scottsville, Kan.
Rawlings, Ellen	D. S.	Fr.	Albany
Rawson, Virgil Arthur	M. E.	Sr.	The Dalles
Redmond, Agnes	D. S.	F. Sec.	Portland
Reed, Maurice Albert	Agri.	Fr.	Fresno, Calif.

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Reetz, Wilbur G.	M. E.	Fr.	Junction City
Reeves, Orvill Greenleaf	M. E.	Sr.	Pendleton
Reichart, Emanuel	C. E.	Soph.	Corvallis
Reichart, Robert Roy	Com.	Fr.	Corvallis
Retzloff, Walter E.	M. A.	F. Sec.	Orland, Calif.
Reynolds, Hugh Milton	Agri.	Fr.	Pasadena, Calif.
Reynolds, Lee Edwards	Agri.	Jr.	LaGrande
Rice, Gladys	D. S.	Fr.	Corvallis
Rice, Thomas Alfred	Min.	Sr.	Portland
Richards, Dale E.	Agri.	Soph.	Kalispell, Mont.
Richards, Lorene	Com.	Fr.	Corvallis
Richards, Thomasyne	D. S.	Jr.	Salem
Richardson, Lucy Kent	Com.	S. Sec.	Forest Grove
Richey, Lester C.	For.	S. Sec.	Portland
Richman, Parnell	E. E.	Fr.	Sutherlin
Ridehalgh, Walter	Com.	Soph.	Portland
Rigdon, Harriet	D. S.	Fr.	Salem
Riley, Chester Arthur	Com.	Soph.	Enterprise
Riley, George N.	For.	F. Sec.	Menlo Park, Calif.
Riley, Lorene	Opt.	.....	Baker
Rinearson, Meldrum	For.	S. Sec.	Portland
Rinearson, Peter Melvin	C. E.	Sr.	Milwaukie
Rinehart, Audra Anna	D. S.	Soph.	Corvallis
Rippen, Cecil V.	Agri.	S. Sec.	Portland
Roake, L. Verne	M. E.	Soph.	Oregon City
Robbins, Charles W.	E. E.	Fr.	Corvallis
Robbins, George Percy	Agri.	Fr.	Warmspring
Robbins, Urban G.	Agri.	Fr.	Warmspring
Roberts, Glenn H.	Agri.	Jr.	Cove
Roberts, John Irving	C. E.	Sr.	Sandy
Roberts, Melvin Parker	Agri.	S. Sec.	Arcata, Calif.
Robertson, Alonzo D.	Agri.	Jr.	Columbus, Ky.
Robertson, Benjamin Harold	C. E.	Jr.	Portland
Robey, Gladys	D. S.	Sr.	Corvallis
Robins, Charles V.	Com.	Soph.	Turner
Robinson, Charles L.	Agri.	Sr.	Forest Grove
Robinson, Ennis	Agri.	F. Sec.	Wilderville
Robinson, Lucius	Agri.	Fr.	Wilderville
Robinson, Mable	Com.	Spec.	Corvallis
Robinson, Paul	Phar.	Fr.	Medford
Robinson, Radburn	M. E.	Fr.	Wilderville
Robson, Allan Edwin	M. E.	Soph.	Corvallis
Rochester, Wm. Beatty	Agri.	Fr.	Santa Ana, Calif.
Rockhill, Ferne	Com.	First Sec.	Riddles
Rodgers, Marie	D. S.	Jr.	Portland
Roe, George Ray	Agri.	Soph.	Pomona, Calif.
Rogers, Wilbur Leslie	M. E.	Fr.	Corvallis
Rohde, George	Phar.	Fr.	Portland

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Rohr, Frank Charles	M. E.	Soph.	Astoria
Rollins, John C.	E. E.	Fr.	Corvallis
Rollins, Ralph Thurston	Com.	Fr.	Corvallis
Romig, Frank Vernon	M. E.	Soph.	McCoy
Rondeau, Ruth Luella	Opt.		Corvallis
Roseman, Charles Hammer	Agri.	Fr.	Corvallis
Roseman, Edw. D.	Agri.	Fr.	Corvallis
Rosenthal, Bertrand	M. E.	Soph.	Portland
Ross, Clifford Coleman	Com.	Spec.	Hood River
Rothenberg, Paul Wm.	Agri.	S. Sec.	Pasadena, Calif.
Rowe, Andrew Carl	M. A.	S. Sec.	Edgewood, Calif.
Ruppa, Wainard	Min.	Fr.	Portland
Rush, Benjamin F.	C. E.	Soph.	Elgin
Rush, Daisy D.	D. S.	Fr.	South Bend, Ind.
Russell, Anna B.	D. S.	Jr.	Portland
Russell, Frank	For.	Soph.	Portland
Russell, Henry Woodruff	Com.	Jr.	Beaver Hill
Rutledge, Anna	D. S.	Jr.	Corvallis
Rutledge, Ralph Merrill	Agri.	Sr.	Corvallis
Sailor, Christine	D. S.	S. Sec.	Portland
Salomon, Wilda	D. S.	Sr.	Salem
Samuelson, Carl	M. A.	F. Sec.	Colton
Sanders, George F.	Agri.	Sr.	The Dalles
Sanders, Lewis Claude	Ind. Arts	Fr.	Corvallis
Sanderson, Maysel	D. S.	Fr.	Klamath Falls
Sant, W. S.	Com.	Soph.	Akola, India
Santee, Joseph Frederick	Com.	Soph.	Corvallis
Santine, Joseph	M. E.	Spec.	Fairbanks, Alaska
Sather, John Adolph	Com.	Soph.	Bend
Sato, Juemon	Agri.	Soph.	Sado, Japan
Savage, Henry Isaac	Agri.	Sr.	Seattle, Wash.
Savage, Robert H.	M. E.	Jr.	Salem
Schaff, Nicholas	Agri.	Jr.	Medford
Schaffer, Charles William	Agri.	Fr.	Auburn, Penn.
Schiewe, L. George	M. E.	Soph.	Portland
Schiffmann, Hazel	Opt.		Bay City
Schmidt, Ella	D. S.	Spec.	Flatbush, N. Y.
Schneider, Edmund	Agri.	S. Sec.	Portland
Schneider, Nicholas	Agri.	S. Sec.	Portland
Schooley, Paul	Agri.	Fr.	Santa Ana, Calif
Schoth, Harry August	Agri.	Sr.	Oregon City
Schreiber, Fred Wm.	Agri.	Sr.	McMinnville
Schreiber, Herbert G.	M. E.	Soph.	McMinnville
Schreiber, Martin Andrew	Agri.	Soph.	McMinnville
Schrepel, Oliver Henry	Agri.	Soph.	Le Sueur, Minn.
Schrodt, Philip J.	Agri.	F. Sec.	Vancouver, B. C.
Schubert, Ben	For.	Soph.	Silverton
Schultz, Elsie	D. S.	Fr.	Gresham

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Schuster, Carl E.	Agri.	Sr.	Corvallis
Schuster, Earl	Phar.	Fr.	Corvallis
Scofield, Amos	Agri.	Fr.	Azusa, Calif.
Scott, Albert Miles	Agri.	Fr.	Ada
Scott, Alfred Merle	M. E.	Fr.	Scotts Mills
Scott, Leo M.	Agri.	Fr.	Irricana, Alta.
Scott, Loyal Edgar	Phar.	First Yr.	Creswell
Scrivner, Ina	D. S.	Soph.	Boise, Idaho
Scudder, Joy Wm.	Agri.	Sr.	Seattle, Wash.
Sears, Briton W.	M. E.	Fr.	Portland
Seehafer, Emilie	Opt.		Corvallis
Seeley, Elmer	Agri.	Fr.	Wilsonville
Seeley, June	D. S.	Fr.	Independence
Seeley, Lynn Victor	E. E.	Fr.	Independence
Seibert, Harry	E. E.	Soph.	Pendleton
Seim, C. B.	M. A.	S. Sec.	Astoria
Selby, Halbert E.	Agri.	Fr.	Bellingham, Wash.
Sendlinger, William	Agri.	F. Sec.	Mosier
Serflinger, Ira B.	M. E.	Fr.	Thomas
Sessions, Philip Roddis	Agri.	Fr.	Portland
Shaver, Leo Arthur	C. E.	Soph.	Mollala
Shaw, Edith	D. S.	Sr.	Salem
Shaw, James Niven	Agri.	Jr.	White Bluffs, Wash.
Shelley, Ellen Kathleen	Opt.		Hood River
Shepard, Ruth Juanita	D. S.	Soph.	Roosevelt, Wash.
Sherman, George Edgar	Agri.	Spec.	Pendleton
Sherwood, Rose	D. S.	Fr.	Portland
Shields, Harley R.	Phar.	Fr.	McCoy
Shields, Winnie Catharine	D. S.	Sr.	Milton
Shindler, Page	E. E.	Fr.	Portland
Shinn, Robert Ervin	Agri.	Sr.	Albany
Shirley, James Carlton	Phar.	Sr.	McMinnville
Shoemaker, Glenn	Agri.	Fr.	Hood River
Shurtliff, Frank Edmond	Opt.		Ogden, Utah
Siebert, Adolph	Com.	Fr.	Portland
Siefert, Herbert Wm.	Agri.	Sr.	Pasadena, Calif.
Sigfrit, Edwin Lee	M. A.	F. Sec.	Mitchell
Sinclair, Freeman W.	Agri.	Fr.	Pasadena, Calif.
Sinks, Victor H.	E. E.	Soph.	Portland
Skelton, Albert Gordon	C. E.	Fr.	Corvallis
Skelton, Mary Vernon	D. S.	Jr.	Corvallis
Slipperrn, Arild Cato	M. E.	Soph.	Ruby, Alaska
Sly, Amy Ethel	D. S.	Fr.	Corvallis
Smart, Wm. Anderson	Agri.	Sr.	Santa Ana, Calif.
Smock, John C.	For.	Fr.	Portland
Smyth, Darius H.	Phar.	Soph.	Burns
Smith, Basil B.	C. E.	Fr.	St. Johns
Smith, Clifton F.	Min.	Soph.	Salem

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Smith, Dexter Ralph	C. E.	Sr.	St. Johns
Smith, Esther R.	D. S.	Sr.	Corvallis
Smith, Howard Parvin	Agri.	Fr.	Gardena, Calif.
Smith, John M.	Agri.	Spec.	Blalock
Smith, Kathryn Matilda	D. S.	Spec.	Marshfield
Smith, Lela Belle	Opt.		Aurora
Smith, Mildred	D. S.	Jr.	Portland
Smith, Simeon C.	Phar.	Fr.	Portland
Soden, Mildred	D. S.	Jr.	Portland
Sodhi, Cham Singh	Com.	Fr.	Punjab, India
Solovioff, Alexander	Agri.	Spec.	Saratav, Russia
Somers, Eugenia	Agri.	Fr.	Corvallis
Soo, Taki Herbert	Agri.	Soph.	Hong Kong, China
Sosey, Paul E.	Phar.	First Yr.	Hood River
Soth, Rodney	Agri.	Fr.	Pendleton
South, Esther Margaret	Opt.		Juntura
South, Lawrance Gardiner	Com.	F. Sec.	Juntura
Southwick, Ralph Harrison	Com.	Fr.	Wallowa
Southwick, Ralph W.	Phar.	Fr.	Salem
Spalding, Donald P.	For.	Fr.	Lowell, Mass.
Spalding, Herbert Alvin	Agri.	Fr.	Portland
Spaulding, H. Clifford	For.	Soph.	Salem.
Spencer, Evelyn	D. S.	Sr.	Portland
Spencer, Robinson	Agri.	Spec.	Cincinnati, Ohio
Spindler, Walter Arthur	Agri.	Fr.	Portland
Sprague, Harry John	Com.	Fr.	Corvallis
Sprague, Hazel	D. S.	Fr.	Corvallis
Stambach, G. Mahlon	Agri.	Jr.	Pasadena, Calif.
Starker, Carl Allison	Agri.	Sr.	Portland
Stauff, Oscar Brent	Agri.	Sr.	Cooston
Stauff, Victor Hugo	Agri.	Sr.	Cooston
Steele, James Ernest	Agri.	Fr.	Parkdale
Steiner, John Godfrey	M. E.	Soph.	Portland
Steinmetz, Avery Harold	Agri.	Jr.	Portland
Stenson, Ernestine Frances	Com.	S. Sec.	Corvallis
Steusloff, L. May	D. S.	Jr.	Salem
Stevens, Horace J.	Agri.	Soph.	Fustin, Calif.
Stevens, Virgil E.	For.	Fr.	Scappoose
Stewart, Roy Cleveland	E. E.	Fr.	Albany
Stewart, William Halbert	For.	Jr.	Fossil
Stidd, Charles Leland	For.	Fr.	Corvallis
Stidd, Erma Phoebe	Opt.		Corvallis
Stirling, Janet	D. S.	Jr.	Burns
Stokes, Iva	D. S.	Jr.	Eugene
Stoppenbach, Donald Chapman	E. E.	Soph.	Portland
Storm, Earl Vasberg	For.	Fr.	Milton
Story, Carl Leverne	Com.	Soph.	Airline
Storz, Charles W.	Phar.	Fr.	Portland

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Stout, Ena May	D. S.	Spec.	Corvallis
Stover, Allan James	Agri.	Fr.	Oregon City
Strain, Clayton	Agri.	Jr.	Pendleton
Straughan, James A.	M. E.	Jr.	Pendleton
Streiff, Albrecht	E. E.	Fr.	Hillsdale
Strome, Carey L.	Agri.	Spec.	Corvallis
Strong, Georgia	D. S.	Fr.	Portland
Struble, Frank Howard	Opt.		Corvallis
Struve, Hans	Agri.	Sr.	Pendleton
Stryker, Gordon David	Com.	F. Sec.	Portland
Stubblefield, Nellie	D. S.	Jr.	Enterprise
Stull, B. L.	E. E.	Soph.	Medford
Stuwe, Herman Carl	M. A.	F. Sec.	Aurora
Suffron, Fay Oakley,	C. E.	Jr.	Dent, Minn.
Sult, Michael C.	For.	Fr.	Summer Lake
Summers, Mylius	D. S.	Sr.	Fresno, Calif.
Sunderlin, Rose Minnie	D. S.	F. Sec.	Sheridan
Supple, Joe	Agri.	Fr.	Portland
Sutherland, Frank G.	Agri.	Soph.	Honolulu, Hawaii
Sutherland, May	D. S.	Soph.	Honolulu, Hawaii
Sutton, George W.	Agri.	Fr.	Port Orford
Sutton, Harry Allen	Min.	Soph.	Aumsville
Swafford, Georgia	D. S.	Sr.	San Luis Obispo, Calif.
Sweeney, Anna Grace	D. S.	Jr.	Grants Pass
Tadlock, Hubert	E. E.	Jr.	Corvallis
Tagg, Elvia	D. S.	Jr.	Warrenton
Tagg, Lystra Alice	Opt.		Warrenton
Tagg, Verna	Com.	Jr.	Warrenton
Tamerlane, Rex	M. E.	Soph.	Portland
Tartar, Lena Belle	Opt.		Corvallis
Tartar, Nicholas Linn	Phar.	Jr.	Corvallis
Taylor, Armond	For.	Soph.	Medford
Taylor, Everett A.	M. E.	Fr.	Corvallis
Taylor, Geo W.	Agri.	Soph.	Corvallis
Taylor, Harold Roy	Agri.	Fr.	Baker
Taylor, Jesse LaVerne	C. E.	Jr.	Oregon City
Telford, Wilbur Linden	M. E.	Soph.	Klamath Falls
Thayer, Gilbert	M. E.	Sr.	Portland
Theobald, Wanda M.	D. S.	Soph.	Silverton
Thomas, Elmer G.	For.	Spec.	Portland
Thomas, George Randolph	E. E.	Jr.	Portland
Thomas, Ralph Wm.	C. E.	Soph.	Corvallis
Thomas Robert	Agri.	Fr.	Anlauf
Thompson, Agnes	D. S.	Soph.	Albany
Thompson, Earl Harstad	Agri.	Soph.	Pasadena, Calif.
Thompson, Emma	Com.	S. Sec.	Roseburg
Thompson, Letitia	D. S.	Fr.	Union
Thordarson, Lillian	D. S.	Sr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Thrift, Theresa Belle	D. S.	Jr.	Coquille
Throne, Robert	M. E.	Fr.	Ashland
Tidball, Lynn Hudson	M. E.	Fr.	Corvallis
Tillery, Merle L.	Com.	Fr.	Corvallis
Tilley, Walker B.	For.	Fr.	Arcata, Calif.
Tinker, George, Jr.	Com.	Fr.	Corvallis
Tinker, Harold Wm.	Agri.	Jr.	Corvallis
Tomlinson, Arthur R.	C. E.	Soph.	Albany
Towne, Elbert Louis	Agri.	S. Sec.	Carrollton, Wash.
Tracy, Merle	D. S.	Fr.	Salem
Trempp, Jess Clarence	E. E.	Fr.	Portland
True, Elsie G.	Opt.		Sherwood
Trusler, Ivan	Opt.		Emporia, Kan.
Tschirgi, Lillian Anna	Com.	Fr.	Oregon City
Tucker, Elmer	Phar.	Jr.	Weston
Tucker, John Edward	Agri.	Soph.	Portland
Tulley, Stewart W.	Agri.	Fr.	Wallowa
Turlay, Marian	D. S.	Fr.	Astoria
Turnbull, James Lockhart	Min.	Fr.	Mooreville
Turner, Arthur Edward	E. E.	Soph.	Corvallis
Turner, Jesse Oland	Agri.	Fr.	Heppner
Turner, Winnifred	D. S.	Soph.	Corvallis
Turnidge, Clement	E. E.	Fr.	Crabtree
Tuttle, Everett	E. E.	Fr.	Boulder, Mont.
Tuttle, Lulu Oleta	D. S.	Soph.	Boulder, Mont.
Tweed, Robert L.	Agri.	Fr.	Ashland
Ueland, Cora Lorraine	Opt.		Roseburg
Underwood, Edw. F.	Agri.	Soph.	Boyd
Underwood, Zetta	Com.	Jr.	Lebanon
Ura, Sensuke	Agri.	Spec.	Alameda, Calif.
Uyei, Nao	Agri.	Soph.	Ohyodo, Japan
Vanderpool, John	Agri.	F. Sec.	Dufur
Vanderwall, Roy E.	Agri.	Soph.	Haines
VanOrsdol, Roscoe Lytton	Opt.		McMinnville
VanWaters, Sherwood P.	Agri.	Fr.	Rensselaer Falls, N. Y.
Vedder, Harold Troxell	M. A.	F. Sec.	Murphy
Venner, Levana	Opt.		Brownsville
Venstrand, Carl P.	Min.	Sr.	Portland
Vestal, Edgar	Agri.	Soph.	Payette, Idaho
Vilas, George Warren	Com.	Fr.	Medford
Vilas, Ned Platt	Agri.	Soph.	Medford
Vincent, Geo. Sylvester	C. E.	Soph.	Sherwood
Vincent, Oliver	Agri.	Fr.	Corvallis
Vineyard, Sarah	D. S.	Sr.	Boise, Idaho
Visel, Nelson S.	Agri.	Fr.	Santa Ana, Calif.
Von Borstel, Frank	Agri.	F. Sec.	Kent
Von Lehe, Herbert H.	Agri.	S. Sec.	Corvallis
Waddle, Robert L.	Agri.	Jr.	Aurora, Nebr.

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Wade, Tracy William	E. E.	Jr.	La Grande
Wahlberg, Elizabeth	D. S.	Spec.	San Francisco, Calif.
Wahlberg, Leif E.	Agri.	Sr.	San Francisco, Calif.
Wakeman, Louis Kenneth	Agri.	Fr.	Portland
Wakeman, William James	Agri.	Fr.	Portland
Walker, Byron Bentley	Agri.	Sr.	Halifax, Nova Scotia
Walker, Eva Estelle	D. S.	Fr.	Mapleton
Walling, Ethel Lucile	Com.	Sp.	Salem
Walls, Olive Kimberlin	Opt.		Corvallis
Walters, Harry Sidney	Agri.	Sr.	Corvallis
Walton, Estey	Agri.	Sr.	Sanger, Calif.
Walton, Fremont Winston	Agri.	Fr.	Salem
Warner, Douglas Holmes	Agri.	Jr.	Portland
Wascher, Frank E.	Agri.	Fr.	Portland
Washburne, James W.	Agri.	S. Sec.	Junction City
Waterfall, Charles Hardy	Com.	Spec.	Vancouver, B. C.
Waterman, Fay E.	Phar.	Fr.	John Day
Watson, Clifton H.	M. E.	Soph.	Portland
Watson, Hal Lincoln	M. A.	S. Sec.	Bellfountain
Watters, William Harp	Min.	Fr.	St. Helens
Waugh, Elma Elizabeth	Opt.		Toledo
Weaver, Clifford	Phar.	Fr.	Springfield
Weaver, Harold	Ind. Arts	Jr.	Enterprise
Webb, Robert Guy	Com.	Jr.	Spirit Lake, Idaho
Weber, Victor Eugene	E. E.	Sr.	Brownsville
Wedel, Mary E.	Opt.		Aberdeen, Idaho
Weller, Stanley M.	Agri.	Fr.	Corvallis
Weller, Theodore Warford	Agri.	Jr.	Corvallis
Wendover, Royce F.	For.	Soph.	Stockton, Kan.
Weniger, Wanda	D. S.	Jr.	Corvallis
Werner, Richard John	Agri.	Fr.	Los Angeles, Calif.
Werth, Conrad	E. E.	Fr.	Newberg
West, Ralph L.	Agri.	Soph.	Westport
Westerfield, Lillian	D. S.	F. Sec.	Oregon City
Wetteland, Rolf Theodore	M. E.	Soph.	Camas, Wash.
Whealdon, Alfred N.	Com.	Soph.	The Dalles
Wheeler, Alvin Wilbur	Agri.	Fr.	Ashland
Wheeler, Lincoln Ward	Agri.	Spec.	Portland
Whitby, Harold R.	Agri.	Jr.	Corvallis
Whitby, J. Harris	Com.	Soph.	Corvallis
White, Cleo Oneeta	D. S.	Soph.	McMinnville
White, Mary Jane	D. S.	Soph.	Corvallis
White, William C.	For.	Fr.	Albany
Whitehill, Ellen	D. S.	Fr.	Portland
Whitehouse, Walter Robert	Agri.	Fr.	Somerville, Mass.
Whitehouse, William Edwin	Agri.	Jr.	Somerville, Mass.
Whiteley, Flora	D. S.	Sr.	Corvallis
Whiteley, Jack Martin	C. E.	Fr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Wicks, Forrest Thrift	M. E.	Fr.	Albany
Wiest, Margaret C.	D. S.	Jr.	Bend
Wiglesworth, Myra	Com.	Fr.	Union
Wiken, Hazel	D. S.	S. Sec.	McGowan, Wash.
Wilcox, Chester Manning	Agri.	Sr.	Portland
Wilcox, Donald Fred.....	Agri.	Spec.	LaManda Park, Calif.
Wilcox, George Burrell	Agri.	Spec.	Almont, Mont.
Wilcox, Lyle P.	Agri.	Fr.	Milton
Wilcox, Ralph M.	Com.	Soph.	Portland
Wilkes, Clair	Agri.	Fr.	Hillsboro
Wilkes, Rhea	D. S.	Fr.	Hillsboro
Wilkes, Ward	E. E.	Fr.	Hillsboro
Wilkins, Grace	Opt.		Coburg
Wilkins, Lester	Com.	F. Sec.	Clem
Wilkins, Mitchell	Agri.	Jr.	Coburg
Willett, Errol William	Min.	Fr.	Portland
Williams, John Floyd	Agri.	Jr.	Cove
Williams, John R.	Com.	Sr.	Portland
Williams, Miriam B.	D. S.	Spec.	Fort Landerdale, Fla.
Williams, William	E. E.	Soph.	Portland
Williamson, Charles Jacob	Com.	Jr.	Corvallis
Williamson, Mary	Opt.		Corvallis
Williamson, Pearl Frances.....	D. S.	Soph.	Albany
Wilson, Bessie Alice	Opt.		North Powder
Wilson, David McKinnon	For.	Soph.	Linnton
Wilson, Isaac James	Agri.	Soph.	Lewiston, Calif.
Wilson, James Albert	Agri.	Jr.	North Powder
Wilson, John	Agri.	Fr.	Corvallis
Wilson, Lois	D. S.	Sr.	Salem
Wilson, Mildred	D. S.	Sr.	Salem
Wilson, Nora	Com.	Soph.	Oregon City
Wilson, Olive	D. S.	Fr.	Yoncalla
Wilt, Clarence Oliver	M. A.	F. Sec.	Sisters
Wingert, Arthur Jacob	Agri.	F. Sec.	Harstine Is., Wash.
Wiren, Loyal	M. A.	S. Sec.	Bandon
Wisdom, Everett Stanton	Agri.	Sr.	Portland
Wise, Clarence	Com.	S. Sec.	Pittsburg, Kan.
Wise, Curtis L.	Com.	F. Sec.	Portland
Wittstruck, Frank Agustave.....	Com.	S. Sec.	Mitchell, S. Dak.
Witzig, Ivy Emma	D. S.	Fr.	Corvallis
Wolff, Garland	Min.	Soph.	Mollala
Wong, Frank	Min.	F. Sec.	Portland
Wood, Florence Edith	Opt.		Corvallis
Wood, John Rollo	M. A.	S. Sec.	Arlington
Wood, Robert J.	Agri.	Jr.	Cottage Grove
Woodburn, Howard	For.	Fr.	Portland
Woodcock, Carl Wesley	M. E.	Fr.	Kerby
Woodcock, Edwin	Com.	Sr.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Rank</i>	<i>Home Address</i>
Woodruff, Herbert M.	E. E.	Soph.	Smith River, Calif.
Woodruff, Milton B.	Agri.	S. Sec.	Smith River, Calif.
Woods, Lee Roy, Jr.	For.	Soph.	Cottage Grove
Woodworth, D.	Agri.	Soph.	Portland
Woodworth, Gladys	D. S.	Spec.	Portland
Woodworth, Grace	D. S.	Spec.	Portland
Wootan, Wm. Barker	M. E.	Fr.	Astoria
Wortman, Everett	Com.	Fr.	Portland
Wright, Byron C.	Agri.	Jr.	Portland
Wright, Lena	D. S.	Fr.	Gresham
Wright, Mark	For.	Fr.	Forest Grove
Wright, Minnie	D. S.	Fr.	La Grande
Wright, Ralph Van Fossen	Agri.	Jr.	Croton, Ohio
Yamamoto, Francis	E. E.	Fr.	Seattle, Wash.
Yates, Ethel	D. S.	Fr.	Salem
Yates, Lloyd D.	For.	Fr.	Milton
Yates, Richard B.	Agri.	Fr.	Dee
Yeager, Francis DeWitt	Agri.	Fr.	Centralia, Wash.
Yeatman, Sara	D. S.	Fr.	Oakland, Cal.
Young, Earl	M. E.	Jr.	Portland
Young, Faith	D. S.	Jr.	Boring
Young, Fred Byron*	M. E.	Sr.	Portland
Young, Marian D.	D. S.	Sr.	Woodburn
Zimmerman, Edward	Min.	Jr.	Yamhill
Zimmerman, Wm. Earl	M. E.	Fr.	Portland
Zimmerman, Wilson Stuart	Opt.		Portland
Zwicker, Arthur E.	Agri.	Jr.	Portland

*Deceased.

SUMMER SCHOOL STUDENTS

(Abbreviations indicate major courses as follows: Coll., College, including agriculture, domestic science and art, manual training, etc.; Meth., methods in teaching industrial and other subjects in public schools; Prep., preparation for teachers examinations; Super., methods in supervision and high school branches. Most students were registered in two or more of these courses.)

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Abbott, Helen Z.	Meth.	Bandon
Adams, Belva Lee	Coll.	Corvallis
Alexander, George	Coll.	Oakland, Calif.
Allen, Bertha	Coll.	Grants Pass
Allison, Mrs. Nannie	Meth.	Walla Walla, Wn.
Anderson, Verlie	Coll.	Corvallis
Applewhite, Mrs. Alice Hill	Coll.	Corvallis
Atherton, Leona Crawford	Coll.	Heppner
Atherton, Rae Margaret	Meth.	Heppner
Bahr, Mrs. Alice Jenkins	Meth.	Grande Ronde
Bahr, J. A.	Meth.	Grande Ronde
Bailey, Mrs. Hattie L.	Meth.	Parkdale
Baird, Alice	Coll.	Portland
Baird, Mary	Coll.	Portland
Ballhorn, Otto	Coll.	Woodland, Wn.
Banks, Emmeline Frances	Prep.	Portland
Banks, Marguerite Jessie	Prep.	Portland
Barrett, Alice Hilda	Meth.	Eugene
Bates, Margaret F.	Prep.	Redmond
Blaylock, Thos. R.	Meth.	Newberg
Boies, John	Coll.	Harlan
Boies, Thurza	Coll.	Harlan
Bones, D. Chesley	Super.	Taft
Bonner, Sadie	Meth.	Corvallis
Botts, Dysart	Prep.	Lancaster, Mo.
Botts, Minerva	Meth.	Lebanon
Bowers, Ether I.	Prep.	Wendling
Brewer, Grace M.	Meth.	Oregon City
Butler, Alice	Coll.	Mapleton, Iowa
Calvin, Mrs. D. M.	Meth.	Touchet, Wn.
Carlson, Evelyn	Coll.	Corvallis
Carlson, Ruth	Coll.	Corvallis
Carlson, Vida	Coll.	Corvallis
Carr, Mrs. Mattie	Meth.	Yoncalla
Cask, Regina	Coll.	Portland
Cate, Mary Enid	Meth.	Newberg
Cheney, Maribel Whitman	Coll.	Corvallis
Christenson, Josephine	Meth.	Baker
Compton, Ada Leona	Coll.	Crabtree

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Coon, Abbie	Coll.	Corvallis
Copeland, Mildred	Coll.	Astoria
Corbett, Ruth Lillyn	Meth.	Corvallis
Cowgill, Helen Julia	Meth.	Corvallis
Cunning, Jennie M.	Meth.	Baker
Davis, Mrs. Margaret	Coll.	Newport
Dickey, Chester Allan	Coll.	Molalla
Doolittle, Lydia	Coll.	Corvallis
Doty, Mable	Prep.	Redmond
Duncan, Ruth Pauline	Coll.	Scappoose
Edwards, Bertie Belle	Meth.	La Grande
Enright, Levi Herr	Meth.	Eugene
Enright, Mrs. L. H.	Meth.	Eugene
Estes, Marie	Coll.	San Francisco, Calif.
Feathers, Mable	Prep.	Corvallis
Filler, Elizabeth	Meth.	Vancouver, Wn.
Ford, William Allen	Prep.	Pendleton
Freeman, Agnes Ruth	Meth.	Harrisburg
Gardner, Mable	Meth.	Corvallis
Garvin, Coral Lillian	Coll.	Corvallis
Garvin, Pearle Ethelyn	Coll.	Corvallis
Gastrock, Louise Anna	Coll.	Aurora
Gellatly, Nellie Lyle	Coll.	Corvallis
Gilbert, Mahlon Bruce	Coll.	Woodburn
Godbersen, Anna C.	Meth.	Mosier
Goodall, Fannie Amelia	Prep.	Corvallis
Gray, June	Meth.	Eugene
Hardman, Eleanor	Coll.	Corvallis
Hardman, Sylvia	Coll.	Portland
Harmon, Mrs. Grace G.	Coll.	Corvallis
Hash, Zella Mae	Prep.	Ashland
Hawley, Erma	Meth.	Baker
Hemmings, Flora M.	Super.	Portland
Hill, Mable	Meth.	Junction City
Hirst, Bernard	Coll.	Sitka, Alaska
Hobbs, Grace E.	Meth.	Eugene
Holmes, Marguerite	Coll.	Central Point
Holt, Hazel	Coll.	Corvallis
Huff, Charlotte B.	Meth.	Enterprise
Hughes, Winfield Scott	Super.	Los Angeles, Calif.
Irwin, Zoa	Coll.	Burns
Jackson, Leona	Meth.	Monmouth
Jordan, Mrs. Lena	Coll.	Corvallis
Jordan, Melvin Harold	Coll.	Corvallis
Johnston, Agnes	Meth.	Oregon City
Keefover, Mrs. Daisy	Prep.	Corvallis
Keelan, Frank B.	Meth.	Deer Island
Keller, Mrs. Myrtle A.	Coll.	Redmond, Wn.

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Keller, Ralph Walter	Coll.	Redmond, Wn.
Kerr, Lynette	Coll.	Corvallis
King, Bertha Anna	Prep.	Corvallis
Lane, Dorothy	Coll.	Corvallis
Laman, Maude	Prep.	La Fayette
Landers, Mrs. J. S.	Coll.	Pendleton
Lapham, Ethel	Meth.	Corvallis
Lovett, Bert P.	Super.	Waldport
Lyster, Kathleen	Coll.	Gardiner
Lytle, Grace	Coll.	Bonanza
Mason, Joy	Coll.	Hood River
McConnell, A. P.	Meth.	Vancouver, Wn.
McKee, Adelia Hazel	Coll.	Corvallis
McMillan, M. Estella	Coll.	Lorane
McReynolds, Esta	Meth.	Eugene
Melendy, Mrs. I. A.	Coll.	Portland
Miller, Helen	Coll.	Corvallis
Mitchell, Ethel	Meth.	Wallowa
Monroe, Helen S.	Meth.	Long Beach, Calif.
Morris, Nellie	Coll.	Salem
Mosken, Tilda	Coll.	Houston, Minn.
Murphey, Foster	Coll.	Evanston, Ill.
Nedry, Earl B.	Super.	Neskowin
Paine, J. Howard	Coll.	Portland
Patterson, Neva	Prep.	Portland
Payne, Nola	Coll.	Woodburn
Peavy, Bradley	Coll.	Corvallis
Philpott, June	Coll.	Corvallis
Pimm, Alice	Meth.	Philomath
Pimm, Carrie M.	Meth.	Eugene
Reed, Gellesie Bobbie	Prep.	Corvallis
Richardson, Mrs. Lucinda	Meth.	Springfield
Richardson, Lucy Kent	Coll.	Forest Grove
Ridenour, Elinor	Coll.	Corvallis
Roberts, Gladys	Prep.	Marshfield
Rogers, Mary	Coll.	Corvallis
Rosenthal, Elizabeth	Meth.	Seattle, Wn.
Russ, Edna Mae	Meth.	Corvallis
Ryan, J. C.	Super.	Forest Grove
Savage, Grace Sylvia	Coll.	Grants Pass
Sevy, Isaac Berton	Super.	Milton
Sexton, Ellen E.	Meth.	Pendleton
Sexton, Margaret T.	Coll.	Portland
Sloan, William Finley	Super.	Camp Crook, S. D.
Smith, Esther	Coll.	Corvallis
Smith, Simeon	Coll.	Portland
Stratton, Arletta	Meth.	Yoncalla
Stone, Mrs. Andie	Prep.	Beaver

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Stutz, Lelia Bertha	Coll.	Corvallis
Sunderland, Mary	Meth.	Portland
Tadlock, Kate	Meth.	Corvallis
Thompson, Alice	Meth.	Ashland
Thordarson, Franklin	Super.	Lebanon
Tillery, Genevieve	Meth.	Corvallis
Turlay, Maude J.	Coll.	Corvallis
Turnidge, Cora Lenore	Coll.	Sheridan
Ueland, Emma	Meth.	Roseburg
Vancouvering, Martin	Coll.	Brawley, Calif.
Veit, Louise M.	Coll.	Corvallis
Veit, Mathilda	Coll.	Corvallis
Wallan, Clara Elsie	Meth.	Hermiston
Weaver, Effie	Coll.	Myrtle Creek
Weniger, Wanda	Coll.	Corvallis
White, Albert	Prep.	Milton
Williams, Miriam Blanche	Coll.	North Bend
Wilson, Nora Mary	Coll.	Oregon City
Woodcock, Milton Edwin	Coll.	Corvallis

BOYS' AGRICULTURAL COURSE, 1913

Abegg, Fred	Portland
Ball, Dewey	Eugene
Buxton, Oliver	Forest Grove
Coleman, Maynard Andrew	Corvallis
Connett, Darwin	Lebanon
Cowan, John	Portland
Davis, Don D.	Newport
Donnell, Merrill	The Dalles
Edwards, Floyd M.	Monroe
George, Walter Bruce	Portland
Hart, Paul Merril	Glendale
Hemphill, John Cannon	Corvallis
Hillibrand, Gail	Suver
Holmes, Eugene	Shedds
Hostellar, Wilbur	The Dalles
Johnson, Frank	Corvallis
Jones, Gordon	Gervais
Kern, Frederic	Portland
Kuck, Ernest A.	The Dalles
Lambirth, James	Eugene
Montgomery, Harold	Crabtree
Morris, Alfred Huff	Portland
Osborn, Grant	Roseburg
Redford, Edwin	Dorena
Reed, Russell	Estacada
Rhea, Hugh	Echo
Riddle, Mathew	Grants Pass
Robbins, John	Canby
Scroggin, Ralph	Lebanon
Smith, Lynde C.	Wasco
Swartz, Guy	Amity
Turtledove, Harry	Portland
Vial, Robert	Portland
Willoughby, Ralph	Harrisburg
Woodward, Percy	Roseburg

SPECIAL MUSIC STUDENTS

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Barfoot, Florence Marion	Voice	Corvallis
Bedynik, John P.	Violin	Corvallis
Bedynik, Mary Elizabeth	Piano	Corvallis
Bent, Anna Elizabeth	Piano	Corvallis
Blackledge, Janet Ann	Voice	Corvallis
Blackstone, Mrs. Paul	Piano	Albany
Blair, Bernard Claude	Voice	Seattle, Wn.
Broders, Chester Ogburn	Piano	Corvallis
Broders, Roy Raymond	Piano	Corvallis
Buxton, Vera Pearl	Piano	Corvallis
Churchman, Tressa	Piano	Corvallis
Darst, Susie	Piano	Corvallis
Davis, Leonard Smith	Clarinet	Corvallis
Davis, Norma	Piano	Corvallis
Edwards, Mrs. J. H.	Voice	Corvallis
Fischer Aleece Wilma	Piano	Corvallis
Glaser, Frederick Liveright.....	Cornet	Lebanon
Gray, Joseph Glen	Violin	Corvallis
Grimm, Hazel Florence	Voice	Tacoma, Wn.
Haight, Rachel Webb	Voice	Corvallis
Hamlin, Louis Willard	Violin	Corvallis
Hamlin, Lucile Anna	Voice, Piano	Corvallis
Hardman, Eleanor Christine	Piano	Corvallis
Harper, George	Clarinet	Corvallis
Hartsock, Mrs. Samuel	Piano	Corvallis
Herse, Rosa Marie	Voice	Corvallis
Hooper, Hazel Margaret	Harmony	Elgin
Hout, Frank	Piano	Corvallis
Howard, Robert Madison	Trapps	Corvallis
Johnson, Warren	Cornet	Corvallis
Jones, Frieda Buryl	Piano	Corvallis
Kerr, Marion	Violin	Corvallis
Kuhlman, Mrs. D.	Voice	Corvallis
McGinnis, Alice	Voice	Corvallis
McGinnis, Iva Belle	Voice	Corvallis
Mixter, Vera May	Piano	Albany
Moore, Dorothy	Piano	Corvallis
Morgan, Irene	Voice	Corvallis
Myers, Maurice	Violin	Corvallis
Osborne, James Bezelah	Voice	Corvallis
Payne, Rita Regina	Piano	McMinnville
Pelland, Helen	Voice	Corvallis
Pierce, Fred Owen	Piano	Corvallis
Porter, Mildred	Piano	Corvallis
Pugh, Rhoda Sarah	Piano	Corvallis

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Rogers, Elma Ola	Piano	Corvallis
Sandon, Helen Beatrice	Piano	Corvallis
Schrepel, Oliver Henry	Cornet	Philomath
Severt, Theron Charleston	Voice, Piano	Yamhill
Sheak, Edith	Voice	Philomath
Skipton, Lawrence	Violin	Corvallis
Story, Frank	Cornet	Airlie
Thompson, Doris Weller	Piano	Corvallis
Turlay, Mabel	Piano	Corvallis
Turlay, Maude Josephine	Voice	Corvallis
Watson, Margaret Bourne	Piano	Corvallis
Welch, Litta	Piano	Corvallis
Williams, Arda Mae	Piano	Corvallis
Wilson, John	Voice	Corvallis

WINTER SHORT COURSE STUDENTS

(The following abbreviations are used to indicate the course in which the student registered: Agri., General Agriculture; Agron., Agronomy; A. H., Animal Husbandry; Bus. Meth., Business Methods; D. H., Dairy Husbandry; D. S., Domestic Science and Art; Hort., Horticulture; Mech. Arts, Mechanic Arts; P. H., Poultry Husbandry.)

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Abbe, John	Agri.	Corvallis
Adams, A. Stanley	Hort.	Albany
Alexander, J. E. H.	Hort.	Sheridan
Anderson, Rachel Sarah	D. S.	Drewsey
Archibald, A. D.	Agri.	Corvallis
Armstrong, Charles H.	Hort.	Keremos, B. C.
Armstrong, Edward Cargill	Hort.	Keremos, B. C.
Arnold, Hosmer K.	Hort.	Portland
Atwater, Philip D.	A. H.	Hood River
Atwood, J. R.	P. H.	Chicago, Ill.
Bailey, C.	Agri.	Corvallis
Baker, Chas. L.	Agri.	Corvallis
Baker, Mrs. J. B.	D. S.	Corvallis
Bane, S. B.	Agri.	Corvallis
Banner, Mrs. T. R.	D. S.	Corvallis
Boyer, Mrs.	D. S.	Corvallis
Beardsley, Bessie M.	D. S.	Corvallis
Burnett, M. P.	Agri.	Corvallis
Barns, R. C.	Agri.	Ashland
Barr, Mrs. W. A.	D. S.	Corvallis
Batchelor, F. M.	Hort.	Yoncalla
Beedle, John Raymond	Hort.	Salem
Belle, Gene	Music	Salem
Berman, D. D.	Agri.	Corvallis
Bevens, F. D.	Agri.	Corvallis
Black, A. L.	Agri.	Mt. Vernon
Blackler, Perry	P. H.	Oroville, Wash.
Blevins, Alfred	Hort.	Tangent
Bliss, J. A.	D. H.	Corvallis
Bolhin, Harry	Agri.	De Forest, Wis.
Borovicka, Joe	D. H.	Crabtree
Boyce, Henry Francis	Agron.	San Francisco, Calif.
Boyce, Mrs. H. F.	D. S.	San Francisco, Calif.
Bradburn, Geo. A.	Hort.	Roseburg
Bradford, Miles T.	Agri.	Salem
Branthoover, F. F.	Com.	Payette, Idaho
Briedwell, Adeline	D. S.	Amity
Briedwell, C. E.	A. H.	Amity
Brower, Mrs. B. G.	D. S.	Corvallis
Brown, Clara	D. S.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Brown, R. W.	Agri.	Shedds
Brown, Thomas	Com.	Yankton
Brunquist, Miss Lee	D. S.	Hood River
Bryant, Ed. H.	Mech. Arts	Toledo
Bryant, Frank W.	Agron.	Albany
Bryant, Henry H.	Agron.	Albany
Brydon, James M.	Hort.	Victoria, B. C.
Buchanan, Mrs. J. E.	D. S.	Corvallis
Buchanan, J. F.	Agri.	Corvallis
Buff, F. W.	Hort.	Hood River
Bundy, Lyman A.	Agri.	Corvallis
Burnham, Wm. Ross	D. H.	Hood River
Butler, Tessie	D. S.	Portland
Calderwood, Mrs. Laura	D. S.	Astoria
Card, C. S.	Hort.	White Salmon, Wn.
Carrington, Willis E.	P. H.	Portland
Carter, Mrs. R. Bell	D. S.	Corvallis
Chapman, Mrs. Florence J.	P. H.	Corvallis
Charley, F. S.	Com.	Brownsboro
Christen, Theodore	Com.	Hubbard
Clark, Donald S.	Hort.	Medford
Clarke, Herbert F.	A. H.	Portland
Clarke, H. H.	Hort.	Portland
Coburn, Arthur D.	Hort.	Seattle, Wash.
Coffey, Jay R.	Hort.	Portland
Coleman, Mrs. J. B.	D. S.	Corvallis
Colvin, H. P.	Agron.	Haines
Cone, F. M.	A. H.	Gaston
Cook, Thomas L.	Hort.	Palisades, Wash.
Cooley, Edwin R.	A. H.	Hood River
Cooley, Mrs. E. R.	P. H.	Hood River
Coon, W. W.	Agri.	Corvallis
Cooper, T.	Agri.	Corvallis
Cramer, S. R.	Agri.	Corvallis
Creese, Harold H.	Hort.	Vancouver, B. C.
Daly, R. C.	Agri.	Corvallis
Davis, Mrs. W. G.	D. S.	Corvallis
Denison, John	Agri.	Troutdale
Devin, Frank P.	Com.	Forest Grove
Doerfler, Alexander	Agri.	Silverton
Doerfler, Frank	Com.	Silverton
Donaldson, J. W.	Agri.	Salem
Dorr, George	Hort.	Albany
Dorsey, Edw. B.	Hort.	White Salmon, Wn.
Edelman, Archie N.	Hort.	Camas, Wash.
Edgell, Corbin	Hort.	Eagle Point
Edmonds, James	Hort.	Keremeos, B. C.

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Edwards, Marion A.	Hort.	Camas, Wash.
Elam, W. R.	Agri.	Corvallis
Engeman, J. H.	Agri.	Silverton
Euwer, Eugene C.	Hort.	Parkdale
Fargo, Mrs. George K.	D. S.	Portland
Fargo, George K.	Hort.	Portland
Fay, Charles D.	Com.	Aurora
Ferguson, D. W.	Hort.	Salem
Fox, Roy M.	D. H.	Silverton
French, Mrs. H. T.	D. S.	Corvallis
Fryer, Roy	Hort.	Yamhill
Gabriel, O. E.	Agri.	Corvallis
Gates, Daniel S.	Agri.	Corvallis
Gates, Robt. D.	Agri.	Corvallis
Gellatly, Robert Holmes	Agri.	Philomath
Gentlem, James	Agri.	Independence
Gibson, Joseph B.	Agri.	Ashland
Gibson, Mrs. Vane G.	D. S.	Corvallis
Goetz, Leonard	Com.	Albany
Goldsbury, John	A. H.	Parkdale
Goodenough, W. H. Jr.	D. H.	Hood River
Gorham, Rollin F.	D. H.	Josephine
Gottlieb, Wm.	Com.	Hillsboro
Gould, George W.	Hort.	Caldwell, Ida.
Graham, S. C.	Hort.	White Salmon, Wn.
Greenburg, Alfred	Agri.	Beaverton
Gruenig, Mrs. A.	D. S.	Corvallis
Greene, Robert W.	Hort.	Winthrop, Wash.
Gregg, Maude	D. S.	Gazelle, Cal.
Grell, Harvey	D. H.	Tangent
Griffin, Mrs. F. L.	D. S.	Corvallis
Guisness, O. B.	Hort.	Portland
Hall, W. R.	Hort.	Buena Vista
Hall, William H.	Hort.	White Salmon, Wash.
Hamel, Mrs. Mella	D. S.	Culver
Hammel, Mrs. Mary V.	D. S.	Corvallis
Hansen, Harry	Com.	Beaverton
Hanson, Mrs. R. K.	D. S.	Corvallis
Harmon, Mrs. Grace	D. S.	Corvallis
Harry, Mrs. T. F.	D. S.	Corvallis
Hart, Edward	Com.	Portland
Hart, W. F.	Agri.	Corvallis
Haseltine, Sarah	D. S.	Corvallis
Hartung, E. E.	Agron.	Eugene
Hays, Florence	D. S.	Corvallis
Hector, Carl	Agron.	Corvallis
Hector, Henry	Agri.	Corvallis
Hemingman, H. C.	Agri.	Corvallis

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Henderson, Mrs. S. L.	D. S.	Corvallis
Herse, Kurt F.	Com.	Corvallis
Hewett, Margaret W.	D. S.	Portland
Hinds, H. J.	Agri.	Philomath
Hinkle, Dale	Agri.	Hermiston
Holbrook, Helen Corey	D. S.	Goble
Hollister, Mrs. F. O.	Agri.	Corvallis
Hotchkiss, Mrs. Ira	D. S.	Corvallis
Howell, Mrs. Bernice Garlock	D. S.	Corvallis
Hubble, Mrs. H. H.	D. S.	Corvallis
Hughson, Mrs. Jennie	D. S.	Corvallis
Hyland, Ernest E.	Agri.	Oakridge
Irwin, Watson	Hort.	Guler, Wash.
Isom, Jeff Jr.	Mech. Arts	Albany
Jacobs, Fred	Agri.	Corvallis
Jackson, H. E.	Hort.	Albany
Jamme, Andrew	A. H.	Hood River
Jeffery, George E.	Agri.	Talent
Jeffersen, Edward	Com.	Hood River
Jernstedt, Ernest	Agri.	Carlton
Johns, Walter I.	Hort.	Myrtle Creek
Johnson, Mrs. Adell	Agri.	Corvallis
Johnston, Edith	D. S.	Corvallis
Johnston, J. V.	A. H.	Oregon City
Jones, Irving S.	D. H.	Wheeler, Ind.
Jones, George A.	D. H.	Bend
Jones, W. F.	Agri.	Looking Glass
Jones, W. M.	Agri.	Corvallis
Keiger, Deck	Agri.	Corvallis
Kellogg, Mrs. M. E.	D. S.	Corvallis
Kimball, Fordham B.	A. H.	Hood River
Kimball, Stuart E.	Hort.	Hood River
Kimball, Walter	Agri.	Hood River
King, Abe	D. H.	Corvallis
Knight, Mary Johnston	Hort.	Hood River
Koeppel, Oliver D.	Agri.	Portland
Korb, Elsie	D. S.	Salem
Lambert, Clementine	D. S.	Portland
Lane, J. H.	A. H.	Silver Lake
Lange, Henry	Mech. Arts	Scappoose
Lange, Gus	Agri.	Scappoose
Larson, Pete	Agri.	Boring
Latourette, Kenneth Scott	Hort.	Oregon City
Leibner, Alma	D. S.	Corvallis
Livingston, Bersch E.	D. H.	Richmond
Lowrey, George	Agri.	Corvallis
Loy, Fred	A. H.	Independence
Loy, John R.	A. H.	Buena Vista

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
McCormick, Joe	Agri.	West Woodburn
McCrae, P. H.	Agron.	Petersburg, N. D.
McGladley, G. S.	Agri.	Eugene
McLain, Frank E.	Agri.	Corvallis
McLaughlin, Mrs. A. M.	D. S.	Corvallis
McLaughlin, O. W.	Agri.	Independence
McKenzie, William Thomas	D. H.	Portland
Mackenzie, Joseph C.	Agri.	Corvallis
Macrum, C. A.	Hort.	Portland
Marsh, A. H.	Agri.	Looking Glass
Marsh, Donald	Agri.	Port Orford
Marsh, John R.	Agri.	Port Orford
Marston, Jason	Agri.	Myrtle Creek
Martin, Nellie	D. S.	Lafayette
Martinson, Anton	Agri.	Tidewater
Mears, Raymond J.	Agron.	Shedds
Meldrum, Miss E. S.	F. H.	Milwaukie
Mercer, Lester H.	Agri.	Stanger, Alta.
Mohr, Peter J.	Hort.	Hood River
Moody, Mrs. Charles J.	D. H.	Parkdale
Moody, Charles J.	Hort.	Parkdale
Moore, Raymond G.	Hort.	Portland
Morrison, M. M.	D. H.	William
Murphy, O. T.	Com.	Independence
Nelson, F. T.	A. H.	Keno
Nelson, Grant H.	A. H.	Keno
Nelthorpe, Harry	Hort.	Seattle, Wash.
Newhouse, Mrs. M.	D. S.	Corvallis
Nichols, Rudolph	Agri.	Corvallis
Niles, Clyde E.	D. H.	Grants Pass
Niles, Mrs. Clyde E.	D. S.	Grants Pass
Norris, Edna E.	D. S.	Fort Klamath
Odeen, Adolph	D. H.	Portland
Ogata, Rinzo	Agri.	Sunnyside, Wash.
Ollis, Fletcher	A. H.	Corvallis
Orton, Alice G.	D. S.	Battle Ground, Wash.
Orton, E. Josephine	D. S.	Battle Ground, Wash.
Parly, C. A.	Agri.	Corvallis
Park, Charles	Agri.	Corvallis
Park, Lawrence W.	Agri.	Corvallis
Park, Joseph	Agri.	Corvallis
Patterson, Stewart	Agri.	Medford
Patton, Hamilton	Hort.	Highland Park, Ill.
Peil, Mrs. F. C.	D. S.	Corvallis
Peters, Albert W.	A. H.	Hood River
Peterson, Ernest	Agri.	North Bend
Peterson, Frank J.	Agri.	Corvallis
Pfenninger, Lillian	D. S.	Milwaukie

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Phillips, Mrs. D. C.	D. S.	Corvallis
Phillips, Cecil L.	Agron.	Klamath Agency
Phillips, Mrs. Edith G.	D. S.	Corvallis
Porter, J. L.	Agri.	Silver Lake
Potter, Mrs. E. T.	D. S.	Corvallis
Prest, R.	Agri.	Corvallis
Preston, Frank	A. H.	Medford
Price, W. I.	Agri.	Corvallis
Price, Mrs. W. I.	D. S.	Corvallis
Purdy, Mrs. W. N.	D. S.	Corvallis
Quinn, Oliver R.	Hort.	Alicel
Rae, O. E.	Agri.	Corvallis
Rearden, Barton	Agri.	Corvallis
Rees, W. C.	Hort.	Friend
Richey, Charles M.	Hort.	Corvallis
Rempel, Henry D.	Hort.	Mt. Lake, Minn.
Reynolds, J. M.	Agri.	Corvallis
Robinson, Mrs. C. E.	Agri.	Corvallis
Robinson, Walter F.	Agron.	Bowdoinham, Me.
Rogers, F. R.	Agri.	Looking Glass
Root, Mrs. Eleanor H.	Hort.	Hood River
Root, Ralph	Hort.	Hood River
Rowre, Winthrop A.	Com.	Portland
Ruble, John	Agri.	Salem
Runkle, J. E.	Agri.	Corvallis
Runkle, Mrs. J. E.	D. S.	Corvallis
Ruthrock, Mrs. L. J.	D. S.	Corvallis
Samuelson, Archer	D. H.	Brownsville
Samuelson, Lemont	Agri.	Brownsville
Samuelson, Oliver	A. H.	Brownsville
Schaltenbrand, Mrs. C. A.	D. S.	Corvallis
Schaltenbrand, Otto	A. H.	Sherwood
Schiller, Albert C.	Agri.	Gresham
Schmidlin, Charles	D. H.	Buxton
Schmidt, J. H.	D. H.	Eugene
Schnyder, Walter	Hort.	Portland
Schoppert, Emma	D. S.	Hood River
Schwab, A. A.	Agri.	Gervais
Schunter, C. H.	D. H.	Newberg
Simon, R. G.	D. H.	Hillsboro
Sliperaty, Mrs. Bessie	D. S.	Corvallis
Skouboe, Adolph	Hort.	Portland
Smith, Mrs. Ed	D. S.	Corvallis
Smith, J. M.	A. H.	Blalock
Smith, V. H.	Agron.	Wasco
Srigley, H. L.	Agri.	Corvallis
Stare, Mrs. H. R.	D. S.	Corvallis
Stebbins, F. Wilmer	Hort.	Camas, Wash.

<i>Name</i>	<i>Course</i>	<i>Postoffice</i>
Steinhoff, Anna	Com.	Sherwood
Stenson, Mrs. C. R.	D. S.	Corvallis
Stenson, Maude O.	D. S.	Corvallis
Stickney, Harry F.	Agri.	Underwood, Wash.
Story, Frank	Agri.	Airlie
Stroda, Gregory	Agri.	Harrisburg
Strong, Clarence C.	Com.	Washougal, Wash.
Sunderland, Claude	Agri.	Portland
Thomas, Victor	A. H.	Anlauf
Tiff, Mrs. C.	D. H.	Portland
Truitt, Wendell George	D. H.	Oakland
Tucker, Harold F.	Agri.	Hood River
Uppendahl, Mr.	Agri.	Hubbard
Verney, Sam J.	Agri.	Corvallis
Walling, J. B.	Agri.	Corvallis
Vallstadt, William	Com.	Lebanon
Wade, Fred F.	Agri.	White Salmon, Wn.
Walker, M. L.	Agri.	Corvallis
Warford, L. E.	Com.	Albany
Warnock, Crystal	D. S.	Nortons
Watkins, J. Marshall	Agri.	Mt. Carmel, Pa.
Webster, M. A.	Hort.	Alpine
Welcher, P. H.	Agri.	Corvallis
West, Bessie A.	A. H.	McEwen
West, Karl F.	D. H.	Camas, Wash.
Wetzel, Mrs.	Agri.	Corvallis
Whiteley, Mrs. Agnes	D. S.	Corvallis
Wightman, R. C.	D. H.	Heppner
Wilcox, Neal	Hort.	Oregon City
Williams, Arda	D. S.	Corvallis
Williamson, Clyde	Agri.	Corvallis
Wilson, Lawrence	Agri.	Grants Pass
Wilson, L. F.	Agri.	Corvallis
Wingert, Arthur	Agri.	Corvallis
Wolfe, Glenn H.	Agri.	Corvallis
Wood, Douglas	Hort.	Grants Pass
Wright, J. Nash	Hort.	McMinnville
Zackrehileim, Benjamin	Agri.	Corvallis

HONOR STUDENTS

Honor students, at graduation, are selected on a basis of pre-eminence in both class work and student activities. All courses are represented by honor students, the representation being on the basis of one honor student to every ten seniors in each degree course. No student, however, will be named in the honor list whose merit grade is below seventy-five. The selection is made jointly by faculty and students.

IN AGRICULTURE

Charles Lester Hill
D. C. Howard
Frank Walter Kehrli

Albert Freeman Mason
Francis Edwards Neer
Ralph Merrill Rutledge

IN DOMESTIC SCIENCE AND ART

Alice Rosamond Butler
Esther Ruby Smith
Cordelia Hawley Goffe

Lillian Thordarson
Mildred Marie Wilson

IN ENGINEERING

Civil Engineering—Henry Odeen
Electrical Engineering—Victor Eugene Weber
Mechanical Engineering—Virgil Arthur Rawson
Mining Engineering—Thomas Alfred Rice

IN FORESTRY

Lynn Foster Cronemiller.

IN COMMERCE

Russell Marion Howard

IN PHARMACY

Rose Coffman Mason

IN MUSIC

Lena Belle Tartar

CLARA H. WALDO PRIZES

The Clara H. Waldo Prizes are awarded on a basis of both scholarship and general achievement as follows: (a) Proficiency in literary and scholastic attainments; (b) Success in student activities; (c) Qualities of womanhood; (d) Qualities of leadership. The selection is made by a joint arrangement between faculty and students. To the Senior woman selected, a prize of forty dollars is awarded; to the Junior woman, thirty dollars; to the Sophomore woman, twenty dollars; and to the Freshman woman, ten dollars. Students receiving second and third place in each class are given Honorable Mention.

SENIOR

Lillian Thordarson

SOPHOMORE

Della Jackson

JUNIOR

Abbie Coon

FRESHMAN

Lorna Collamore

The students in each class receiving second and third place, entitling them to Honorable Mention, are:

SENIORS

Mildred Wilson

Lottie Milam

SOPHOMORES

Geraldine Newins

Helen Horning

JUNIORS

Inez Bozorth

Kareen Hansen

FRESHMEN

Marion Mateer

Eva Keatley

FORENSIC HONOR ROLL

INTERCOLLEGIATE ORATOR

L. P. Gambee.

INTERCOLLEGIATE PEACE ORATOR

L. P. Gambee

INTERCOLLEGIATE DEBATORS

E. H. Reichart

H. M. Currey

G. R. Hoerner

F. McCabe

R. A. Parcel, Alternate

CHAMPION INTERCLASS ORATOR

Nao Uyei, Sophomore

CHAMPION IN INTERCLASS DECLAMATION

Evelyn Spencer, Senior

CHAMPIONS IN INTERCLASS DEBATE

N. C. Jamison,

J. E. Norton,

F. W. Kehrli,

} Seniors

WINNER OF SHAKOPEAN CUP

Awarded annually to the member of the senior class having the best
record in forensics for the whole College course.

L. P. Gambee

SUMMARIES*

CLASSIFIED AS TO COURSE

AGRICULTURE	
Regular 36-week courses	496
Short courses	919
FORESTRY	
Regular 36-week courses	81
DOMESTIC SCIENCE AND ART	
Regular 36-week courses	326
Short courses	183
CIVIL ENGINEERING	
Regular 36-week courses	63
ELECTRICAL ENGINEERING	
Regular 36-week courses	74
MECHANICAL ENGINEERING	
Regular 36-week courses	131
Short courses	3
MINING ENGINEERING	
Regular 36-week courses	28
COMMERCE	
Regular 36-week courses	160
Short courses	26
PHARMACY	
Regular 36-week courses	69
INDUSTRIAL ARTS	
Regular 36-week courses	6
OPTIONAL	
Regular 36-week courses	86
MUSIC ONLY	
Regular courses in music	59
SUMMER SCHOOL	
Regular courses	187
	2897
Deduct duplicates	462
Total, excluding duplicates	2435

*The enrollment statistics include those only who have pursued work at the College; correspondence students are omitted.

ANNUAL CATALOGUE

CLASSIFIED AS TO RESIDENCE

[All duplicates excluded.]

STATES AND TERRITORIES

Oregon[All counties represented].....	2018
Alaska.....	7
California.....	111
Colorado.....	2
Connecticut.....	1
Delaware.....	1
Florida.....	1
Idaho.....	32
Illinois.....	18
Indiana.....	7
Iowa.....	4
Kansas.....	8
Kentucky.....	3
Maine.....	1
Maryland.....	1
Massachusetts.....	7
Michigan.....	4
Minnesota.....	7
Missouri.....	3
Montana.....	5
Nebraska.....	3
New Hampshire.....	1
New Jersey.....	1
New Mexico.....	1
New York.....	13
North Dakota.....	1
Ohio.....	6
Oklahoma.....	2
Pennsylvania.....	4
Rhode Island.....	1
South Dakota.....	2
Texas.....	1
Utah.....	1
Washington.....	111
Wisconsin.....	4
Wyoming.....	2
	<u>377</u>

FOREIGN COUNTRIES

Canada.....	17
China.....	3
Greece.....	1
Hawaii.....	6
India.....	6
Japan.....	4
Philippine Islands.....	1
Russia.....	2
	<u>40</u>
Total.....	2435



CLASSIFIED AS TO RESIDENCE

STATES AND TERRITORIES

Oregon	2355
Alaska	8
California	155
Colorado	3
Connecticut	1
Delaware	3
Florida	1
Idaho	43
Illinois	25
Indiana	7
Iowa	6
Kansas	9
Kentucky	4
Maine	1
Maryland	2
Massachusetts	9
Michigan	8
Minnesota	9
Missouri	4
Montana	5
Nebraska	4
New Hampshire	2
New Jersey	2
New Mexico	1
New York	15
North Dakota	1
Ohio	10
Oklahoma	2
Pennsylvania	4
Rhode Island	1
South Dakota	2
Texas	1
Utah	1
Washington	132
Wyoming	2
Wisconsin	5

FOREIGN COUNTRIES

Canada	23	
China	3	
Greece	1	
Hawaii	8	
India	6	
Japan	8	
Philippine Islands	1	
Russia	4	54
		<hr/>
Total	2897	
Duplicates	462	
		<hr/>
Total, excluding duplicates	2435	

COMPARATIVE ENROLLMENT

1888-1889	97
1889-1890	151
1890-1891	201
1891-1892	208
1892-1893	282
1893-1894	240
1894-1895	261
1895-1896	397
1896-1897	316
1897-1898	336
1898-1899	338
1899-1900	405
1900-1901	436
1901-1902	488
1902-1903	541
1903-1904	530
1904-1905	680
1905-1906	735
1906-1907	833
1907-1908	1156
1908-1909	1352
1909-1910	1591
1910-1911	1778
1911-1912	2868
1912-1913	2314
1913-1914	2435

The great difference in the total enrollment for the two years, 1910-11 and 1911-12, was due largely to the increase in the number of students registered for the winter short courses in Agriculture. The increase in the number of regular students in the 36-weeks courses was 24 per cent.

The decrease in the number of students in 1912-13 from the year 1911-12 is due to the decrease in the short course registration. The increase in the number of regular students in the 36-weeks courses was 19 per cent.

NOTE.—In addition to the above listed names, out of a total of 643 students registered in the Farmers' Week courses in Agriculture and Domestic Science and Art, the names of 346 students who were registered in these courses, but in no other College courses, do not appear.

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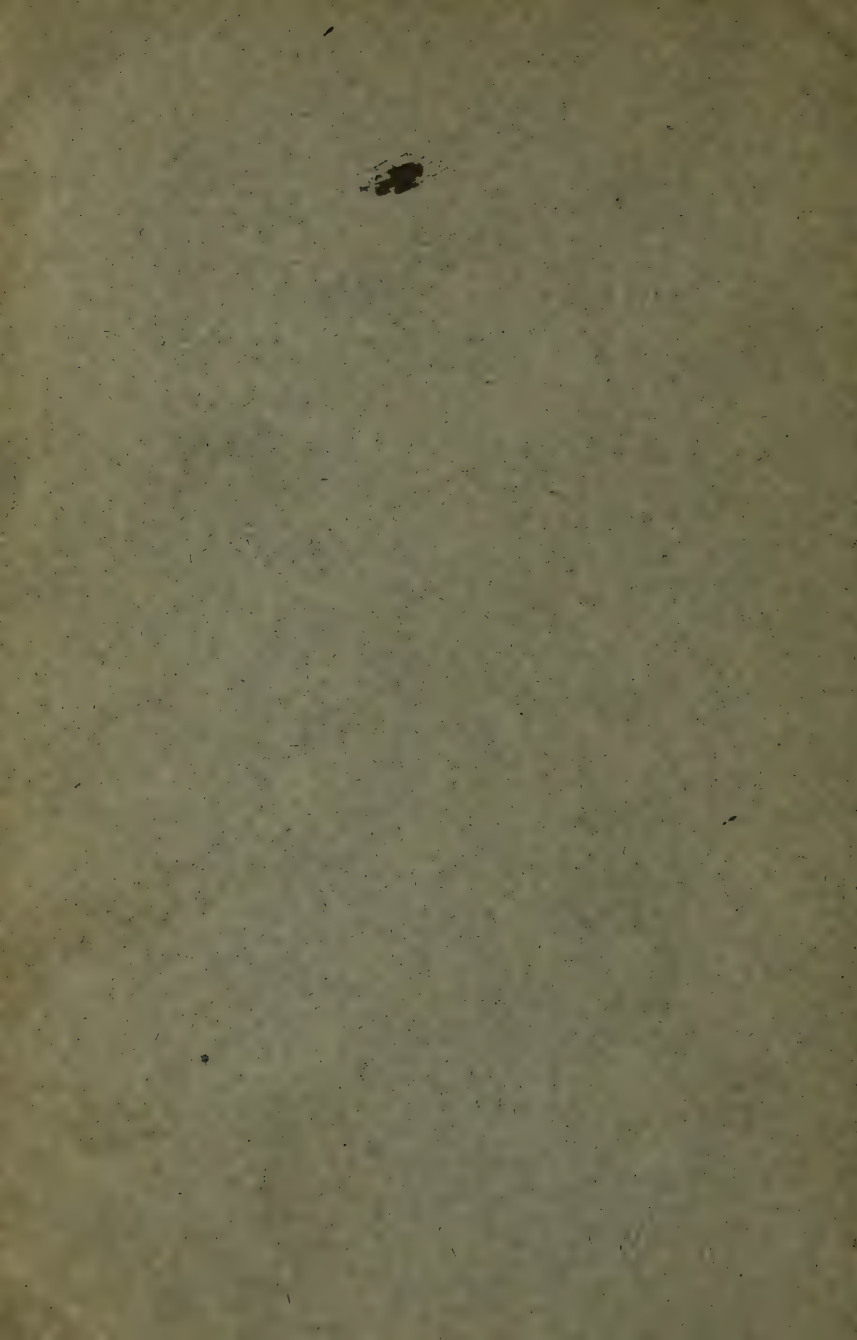
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OREGON AGRICULTURAL COLLEGE

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FOR

1915-1916

WITH LIST OF STUDENTS FOR 1914-1915



CORVALLIS, OREGON

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CORVALLIS, OREGON

JUNE, 1915

CORVALLIS
COLLEGE PRINT SHOP
1915

CALENDAR, 1915-16

1915

JULY	AUGUST	SEPTEMBER
S M T W T F S	S M T W T F S	S M T W T F S
..... 1 2 3	1 2 3 4 5 6 7 1 2 3 4
4 5 6 7 8 9 10	8 9 10 11 12 13 14	5 6 7 8 9 10 11
11 12 13 14 15 16 17	15 16 17 18 19 20 21	12 13 14 15 16 17 18
18 19 20 21 22 23 24	22 23 24 25 26 27 28	19 20 21 22 23 24 25
25 26 27 28 29 30 31	29 30 31	26 27 28 29 30
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OCTOBER	NOVEMBER	DECEMBER
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24 25 26 27 28 29 30	28 29 30	26 27 28 29 30 31
31

1916

JANUARY	FEBRUARY	MARCH
S M T W T F S	S M T W T F S	S M T W T F S
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2 3 4 5 6 7 8	6 7 8 9 10 11 12	5 6 7 8 9 10 11
9 10 11 12 13 14 15	13 14 15 16 17 18 19	12 13 14 15 16 17 18
16 17 18 19 20 21 22	20 21 22 23 24 25 26	19 20 21 22 23 24 25
23 24 25 26 27 28 29	27 28 29	26 27 28 29 30 31
30 31
APRIL	MAY	JUNE
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16 17 18 19 20 21 22	21 22 23 24 25 26 27	18 19 20 21 22 23 24
23 24 25 26 27 28 29	28 29 30 31	25 26 27 28 29 30
30

COLLEGE CALENDAR, 1915-16

1915

September 17, 18, Friday and Saturday—Registration and examinations for admission.

September 20, Monday—Recitations begin.

October 8, Friday—Quarterly meeting of the Board of Regents.

November 1, Monday—Forestry Short Course begins.

November 24, 25, 26, 27, Wednesday (noon), Thursday, Friday, Saturday—Thanksgiving recess.

December 23, Thursday (noon)—Christmas recess begins.

1916

January 3, 4, 5, 6, 7, 8, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday—Farmers' and Home Makers' Week and Rural Life Conferences.

January 5, Wednesday—Quarterly meeting of the Board of Regents.

January 10, Monday—Regular exercises resumed. Winter short course begins.

February 4, Friday—Winter short course ends.

February 5, 7, 8, 9, Saturday, Monday, Tuesday, Wednesday—First semester examinations.

February 10, 11, 12, Thursday, Friday, Saturday—Mid-year vacation.

February 14, 15, Monday, Tuesday—Second semester registration.

February 16, Wednesday—Recitations begin.

February 22, Tuesday—Washington's birthday; a legal holiday.

April 5, Wednesday—Quarterly meeting of Board of Regents.

April 14, Friday—Forestry short course ends.

May —————Military inspection day.

May 30, Tuesday—Decoration Day; a legal holiday.

June 4, Sunday—Baccalaureate sermon.

June 5, Monday—Alumni and Graduating Class Day exercises.

June 6, Tuesday—Commencement exercises.

Final examinations for the second semester will be held on Saturday, June 3; Tuesday afternoon, June 6; Wednesday, June 7; Thursday, June 8; and Friday, June 9.

June 12, Monday—Summer session.

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AND
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HON. C. L. HAWLEY.....	McCoy, 1918
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HON. GEO. M. CORNWALL.....	Portland, 1921
HON. CLARA H. WALDO.....	Portland, 1924
HON. N. R. MOORE.....	Corvallis, 1924
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Professor of Military Science and Tactics.

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Library Cataloguer.

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CHARLES LEWIS PARRISH,
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In Charge of College Exchange.

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DAVID MASTERTON,
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FRANK HARRISON CASE,
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Animal Husbandry Foreman.

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ELLSWORTH ERWIN,
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*On leave of absence.

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3. **Graduate Students and Advanced Degrees**—Professors Skelton, Macpherson, Graves.
4. **Credentials, Advanced Standing, and Substitutions**—Professors Ressler, Gardner, Mr. Tennant.
5. **Schedules**—Professors Johnson, Beaty.
6. **Student Affairs**—Deans Peavy, Fawcett; Professors Beckwith, Reed, Thayer.
7. **Student Domiciles**—Professors Horner, Simpson, Mrs. McElfresh.
8. **Health and Sanitation**—Professors Beckwith, H. V. Tartar, Miss Hadwen.

REVISIONS.

Catalogue, 1915-16.

By action of the College Council taken subsequent to the printing of the body of this catalogue, accepting as full entrance credit one or more years of modern language, and music, as offered in State high schools, the following revisions should be noted:

Page 84—In the second paragraph and second line omit the words "except Music."

Page 126—In the footnote, first line, omit the words "two years."

Page 132—In the footnote omit the last sentence.

Page 159—Omit the first footnote referring to Modern Language.

GENERAL INFORMATION

FOUNDATION AND ENDOWMENT

In pursuance of an Act of Congress, approved by President Lincoln, July 2, 1862, a grant of land to the amount of thirty thousand acres, or its equivalent, was made to each State in the Union for each Senator and Representative in Congress to which the State was entitled by the apportionment of the census of 1860. The proceeds under this Act were to constitute a perpetual fund. The principal of this fund was to remain forever undiminished; but the interest arising from the fund was to be inviolably applied by each State that should avail itself of the benefits of the Act, to the support and maintenance of a "College where the leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." Ninety thousand acres of land were apportioned to Oregon, and by an Act approved October 9, 1862, the Legislative Assembly of Oregon accepted the provisions of the Congressional law.

The Land-Grant Fund. The subsequent sale of this land has netted the College approximately \$200,000. This at present is invested in securities bearing six per cent interest. The Act of Congress of 1862 explicitly demands that no part of the funds so appropriated, or the interest arising therefrom, shall be used for the purchase, erection, or maintenance of any building or buildings.

The Hatch Fund. Under an Act of Congress, approved March 2, 1887, the College receives \$15,000 a year for the maintenance of an Agricultural Experiment Station, "to aid in acquiring and diffusing among the people useful and practical information on subjects connected with agriculture."

The Morrill Fund. On August 30, 1890, an Act was passed by Congress "to apply a portion of the proceeds of the public lands to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under the provisions of the Act of 1862." This Act provides that in 1890, \$15,000 should be paid to each of the land-grant colleges, and that the amount so appropriated should be increased by the sum of \$1,000 annually for ten years, and that thereafter the amount annually appropriated should continue to be \$25,000. Under an Act of Congress, approved March 4, 1907, known as the Nelson Amendment, this fund was increased by the sum of \$5,000 for the fiscal year ending June 30, 1908, and by an additional \$5,000 for each succeeding year until the total annual amount, in 1912, reached \$50,000.

The Adams Fund. An Act of Congress, approved March 20, 1906, appropriated an initial \$5,000 for that year, and \$2,000 additional for each year thereafter until the annual amount should reach \$15,000. This fund is "to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry" of the State, and therefore supplements the Hatch Fund in the maintenance of the Experiment Station.

The Smith-Lever Fund. This fund was established by the Smith-Lever Agricultural Extension Act approved by Congress May 8, 1914. By its provisions the Oregon Agricultural College received \$10,000 from the Federal Government to apply towards the support of the Extension Service for the fiscal year ending June 30, 1915. This sum will be increased annually for seven years until the total amount of \$30,200 is reached. This amount will continue as a permanent appropriation as long as an equal sum be "appropriated for that year by the legislature" of the State, "or provided by State, county, college, or local authorities, or individual contributions within the State for the maintenance of the co-operative agricultural extension work provided for in this Act."

The College, therefore, receives annually from the National Government the following income: (a) interest on the land-grant sales fund, \$12,000; (b) the Hatch fund, \$15,000; (c) the Morrill fund, \$50,000; (d) the Adams fund, \$15,000; (e) the Smith-Lever fund, (1914-15) \$10,000.

In addition to this income derived from the National Govern-

ment, the College is dependent upon the income from the millage tax as provided by the State Legislature of 1913 to become operative April first, 1915.

HISTORY.

As there were no State colleges in Oregon in 1868, the Legislature of that year, which provided for the location of the land received under the Act of 1862, gave the interest on the funds derived from the sale of the land to the Corvallis College, a private institution in Benton County, which was then under the control of the Methodist Episcopal Church, South. For a number of years, none of the land granted was sold, and the Legislature made small annual appropriations for the support of the school.

In 1885, the church voluntarily relinquished its claim on the funds of the College, and the State assumed entire control of the institution. The Legislature of that year provided for the "permanent location of the State Agricultural College at Corvallis, in Benton County," on condition that the citizens of said county should, within four years, erect on the "farm containing thirty-five acres in the immediate vicinity of said city, known as the Agricultural College Farm, brick buildings for the accommodation of said State Agricultural College at a cost of not less than \$20,000." During the summer of 1887, the corner stone of the building erected by the citizens of Benton County was laid by the Governor of Oregon amid imposing ceremonies.

This structure, now known as the Administration building, was the nucleus around which other buildings soon began to cluster, as necessity and growing interest demanded. For a year or two there was ample room; but, as the institution grew, more land was needed and provided, and the institution now owns, instead of the thirty-five acres originally comprising the campus and grounds, three hundred and forty acres; and instead of one structure, thirty-six. There has also been a marked increase in the attendance, from ninety-seven to four thousand one hundred fifty-eight students. Twenty years ago, most of the students came from Benton and neighboring counties. Today, every county in Oregon, thirty-nine other states, and thirteen foreign countries are represented. The increase in the number of students called for an increase in the number of the faculty. This body, from the number of five in 1884, has grown until it now closely approaches two

hundred. Other features usually found in connection with progressive educational institutions have grown in equal ratio. The courses have been strengthened, the standard has been advanced, and other improvements have been made from time to time, which have added to the thoroughness and efficiency of the work.

GOVERNMENT.

The general government of the College is vested primarily in the Board of Regents, and, under their control, in four other administrative bodies—the Administrative Council, the College Council, the Faculty, and the Experiment Station Staff. These bodies, in the exercise of their respective duties, determine the questions of policy and regulate all matters relating to the interests of the institution.

The Board of Regents consists of thirteen members, of whom the Governor, the Secretary of State, the Superintendent of Public Instruction, and the Master of the State Grange, are ex-officio members. The nine other members are appointed by the Governor with the approval of the State Senate, and hold office for a term of nine years. Under a law of the State Legislature, passed in 1885, the Board of Regents constitutes a body corporate, under the name of "The Board of Regents of the State Agricultural College, * * * with power to sue and be sued, and to make contracts," and to enact such regulations as may be necessary for the maintenance and development of the College.

The Administrative Council consists of the President of the College, the Director of the Experiment Station, the Deans of the different Schools, the Director of the Summer School, and the Director of Extension. The function of this Council is to consider and determine the larger questions of policy and administration.

The College Council is composed of the President of the College and all officers of administration and instruction with the rank of professor, associate professor, or assistant professor. This body considers all general questions relating to the educational work and policy of the College; arranges and correlates the courses of study, and determines the requirements for admission and graduation. The different committees of the College Council, representing the several schools of instruction, have charge of the enrollment and progress of students in the respective schools, and investigate the records of all candidates for graduation.

The College Faculty comprises members of the College Council and all other instructors and members of the Experiment Station Staff. It considers routine questions of method and discipline, a function for which it is particularly well adapted, being in close contact with all that pertains to student interests and student life.

The Experiment Station Staff includes the President of the College, the Director of the Experiment Station, the heads of the various departments of the School of Agriculture, and all assistants, engaged in research and experimental work. The members of this staff are engaged in the investigation of problems encountered in the development of the agricultural interests of the State. They also distribute, by means of correspondence, circulars, and station bulletins, information regarding their investigations.

The Students. The College does not undertake to prescribe in detail either its requirements or prohibitions. Students are met on a plane of mutual regard and helpfulness. Since the advantages of the institution are provided at public expense, the students are under special obligation to perform faithfully all their duties, not only to the College, but also to the community and to the State. Whenever the deportment of any student is such that his influence is inimical to the interests of the institution, he will be relieved from further attendance.

PURPOSE AND SCOPE.

The purpose of the College is to provide, in accordance with the Acts of Congress under which it is maintained, a liberal, thorough, and practical education—an education that will afford the training required for efficient service in different branches of industry. The distinctive technical work covers the three great fields of production, manufacture, and commerce. Special attention is given to the application of science. All the practical work in the laboratories, in the shops, in the orchards, and on the farm, is based on scientific principles. While the industrial or technical work is emphasized, the importance of a thorough general training, of mind development, and of culture, is recognized in all of the work throughout the institution. The object is to meet the demand for a broad and general education, supplemented by special technical training.

The work, therefore, covers a broad field, including technical courses along the different lines of agriculture, forestry, home

economics, engineering, mining, commerce, pharmacy, industrial education, and industrial arts; with the necessary training in the basic subjects of mathematics and the natural and physical sciences; and also the general training in language, literature, history, civics, and physical education, which constitutes an essential part of a liberal education.

In all the work of the institution, the object is to train the mind, the eye, and the hand to act in unison; to unfold and coordinate the faculties of mind and body; to develop a symmetrical manhood and womanhood, and a just appreciation of clean, upright citizenship.

LOCATION.

The seat of the Oregon Agricultural College is Corvallis, a city of six thousand inhabitants, situated at the head of navigation on the Willamette River. As the name implies, it is in the heart of the far-famed Willamette Valley. It is readily accessible by steam and electric railway from all parts of the State; it has free mail delivery; there are many churches and no saloons, and the moral tone is equal to that of any city within the boundaries of the State. It is a city of homes, and its people are justly proud of the great institution in the midst of them, and jealously guard its good name.

Situated on high, well-drained land, open to the invigorating sea-breeze, Corvallis is one of the most healthful cities in the State. It has never been visited by any dangerous epidemic disease, and the possibilities of such visitation in the future appear remote, for the city has a complete modern sewerage system and first-class gravity water system, supplied from springs high up the slope of Mary's Peak, the tallest mountain in the Coast Range, some fifteen miles away to the west. The city and its environs are conducive to wholesome student and home life. It has an ample supply of pure mountain water for all domestic and sanitary purposes. The atmosphere is purified and the climate ameliorated by almost constant ocean breezes—warm in winter and cool in summer. The surrounding landscape elicits praise from all who behold its delightful charms as viewed in the extensive area of fertile fields, gardens, and orchards. The wooded glens of the near-by foothills, and the lively mountain brooks, or the more pretentious streams frequented by canoe, yacht, and launch parties, are fruitful sources

of recreation; while the magnificent distant views to the east, where the fir-clad Cascade Mountains, with their wealth of trees and the perennially snow-capped sentinels—Hood, Jefferson, and the Three Sisters—present a constant panorama of picturesque mountain scenery. With such an environment, the city is truly an ideal location for a college and a home.

GROUNDS AND BUILDINGS.

The College Grounds comprise three hundred forty-nine acres. That part of the grounds, ninety-one acres in extent, lying immediately about the several buildings, east of Cauthorn Avenue, and usually designated as the lawns and campus, is tastefully planted with both native and exotic ornamental trees, shrubs, and herbs. The one hundred and forty-three acres used for the farm, garden, and orchard operations is so platted and planted as to meet the demands of the various lines of work and still conform to a general scheme of landscape embellishment. This portion occupies a slightly elevated and gently undulating site wholly within the western limits of the city of Corvallis. In addition to the above plot, one hundred and fifteen acres, comprising the College stock farm, together with the horticultural and poultry tracts, lies just south of the city limits. Broad drives and walks traverse the campus in all directions, thus rendering every objective point easily accessible. The numerous specimen trees, groups of shrubbery, and massed borders are a source of enjoyment as well as of instruction to all those who frequent the grounds. The scheme of planting has been such as to give an air of peaceful activity, orderly effort, earnest purpose, and quiet refinement. Daily association with such scenes for a period of years, during the time when men and women are forming the habits of thought and action that will be theirs through life, is certain to have a deep-seated and subtle influence for good in molding the character of future citizens.

The following brief descriptions will convey a general idea of the principal buildings and the purposes for which they are used:

The Administration Building is a three-story brick structure, 90x120 feet, containing nine recitation rooms, the library, the offices of the President, the Registrar, and the Business Manager. Centrally located and on a slight eminence, it commands an unsurpassed view of the campus, the city of Corvallis, the course of the Willamette River, and the picturesque Cascades.

Science Hall, situated southeast of the Administration building, and constructed of gray granite and sandstone, covers a ground space of 85x125 feet, has three stories and basement, and contains fifty-five rooms. It is one of the most serviceable buildings on the ground, and within it, at present, are the School of Forestry, and the departments of Pharmacy, and Chemistry, with their various laboratories, recitation rooms, and lecture halls, together with the offices and laboratories of the Experiment Station chemists.

Agricultural Hall, standing southwest of the Administration Building, is the largest structure on the campus. It is an imposing edifice of brick and sandstone, consisting of the central or Administrative building, the north or Agronomy wing, and the south or Horticultural wing.

The central or Administrative building is 66x140 feet, four stories and basement, and contains a total of forty-two conveniently arranged and well-lighted class rooms, laboratories, and offices. On the first floor are the offices of the Director of the Experiment Station and Dean of the School of Agriculture, the Professor of Poultry Husbandry, the Director of Extension Service, and the Station mailing rooms. The second floor is occupied by the department of Animal Husbandry; the third floor, by the departments of Zoology and Entomology with their respective museums; and the fourth floor, by the departments of Bacteriology and Art.

The north or Agronomy wing is 72x130 feet, three stories high. It faces north and east, commanding splendid views of the valley and the College grounds. It is thoroughly modern in all its equipment, and while intended solely for the work in Agronomy, at present accommodates, temporarily, two departments. The first and second floors occupied by the department of Agronomy, contain seventeen rooms, variously devoted to laboratory and class purposes in Agrostology, Soil Physics, and kindred subjects. The third floor, with eight rooms, is used by the School of Commerce.

The south or Horticultural wing is 72x130 feet, three stories high. In the basement are located laboratories for plant propagation, spraying, vegetable preparation, and fruit packing. The basement also contains the general storage rooms for the department, and rooms which are especially adapted for the storage of fruits. The first floor contains the offices of the department of

Horticulture, the research laboratory, systematic pomology laboratory, and three large lecture rooms. The second floor contains the offices and museums of the department of Botany and Plant Pathology, three recitation rooms, and three student laboratories. The third floor contains the horticultural museum and horticultural herbarium, photograph room, large student lecture room, draughting rooms, lecture rooms, and office of the Landscape Gardening section. These rooms are all especially well lighted and contain every convenience for conducting the work with efficiency.

Greenhouses. A new range of greenhouses, modern in every respect, has recently been constructed with a view to aiding the student in his studies in commercial greenhouse work. The range is made up of five even-span houses, three ninety feet long by twenty feet wide, and two thirty-three feet long by twenty feet wide, making the total area under glass 6,720 square feet. A modern hot-water heating apparatus has been installed, with valves and pipes so arranged that different temperatures can be maintained in every separate thirty feet of house in the three long houses. Each of the large houses has been divided into sections thirty feet long, so that the entire space in each may be given up to a single crop. Of the two smaller houses, one is given up to research work, and one to the propagation of plants in general. The central building is large and conveniently arranged for all work that is to be met with in greenhouse establishments. Such crops as carnations, chrysanthemums, violets, palms, ferns, general pot plants, and forced vegetables, like tomatoes, lettuce, and cucumbers, are grown in these houses.

Dairy Building. About sixty feet to the northward of the Agricultural building is located the Dairy building. The general scheme of both outside and inside finish is similar to that of the Agricultural building. The structure is 54x141 feet, three stories high. On the first floor are located the offices of the Dairy department and commodious laboratories for butter-making, cheese-making, and market milk instruction, including a well-equipped boiler and engine room and student lockers. On the second floor are the testing laboratory, advanced laboratory, farm dairy and shop rooms, veterinary laboratories, etc. The third floor is temporarily occupied by the department of mathematics, with the exception of a general lecture room, extending across the south end of this floor, and having a seating capacity of two hundred.

Home Economics. The first wing of the new Home Economics building is occupied by the departments of Domestic Science and Domestic Art. This building is located directly west from the Dairy building. It consists of three stories above a high basement, and is finely built of brick and stone. The most modern type of heating and ventilating systems are installed, and all provisions are made for the comfort and convenience of the young women carrying the work in Home Economics. Offices for the Professors of Domestic Science and Domestic Art and the assistants in both Domestic Science and Domestic Art, are on the second and third floors.

The food laboratories are on the first and second floors, while the Domestic Art department has all of the third floor of the building and part of the second floor. Ample locker and dressing rooms are provided for the convenience of the students, and hot and cold water is supplied in all parts of the building. The housing and equipment of the School of Home Economics, in short, are thoroughly modern and adequate.

The Mines Building, which is 65x81 feet in dimensions, is located about 100 yards northwest of the Administration building, and is one of the newer buildings on the campus. This building forms the northern boundary of the quadrangle which is planned in the new building scheme on the College campus. It is a fine four-story structure, constructed of brick, trimmed with stone, and similar in type to Agricultural Hall. The first floor of the building contains the main offices, assaying, metallurgical and ore-dressing laboratories. The basement contains the crushing and sampling rooms, the ceramic laboratory, and the stock rooms. On the second floor will be found the Bureau of Mines laboratory and lecture and class rooms. On the third floor is the geological museum, the mineralogical and petrological laboratories, and draughting room. All the laboratories are provided with water, gas, electric lights, and steam heat.

Mechanical Hall, about one hundred and fifty yards northeast of the Administration building, is 90x120 feet, two stories high, and constructed of Oregon gray granite and sandstone. It is an attractive, substantial building, well arranged and admirably adapted to the purposes for which it is used. Besides recitation and lecture rooms for the classes in Mechanical, Electrical, Civil,

Highway, Irrigation, and Experimental Engineering, it contains the Physical and Engineering laboratories.

Mechanical Arts Building is a modern, well-lighted structure of brick, with cement foundations, 52x52 feet, two stories high, flanked by a one-story wing on the east, 40x220 feet, and a similar wing on the south, 40x200 feet. The central portion contains the office of the Dean, a display room for student work, a tool room for the machine shop, and a finishing room for the wood shop. On the second floor is a general draughting room, 30x50 feet, with a commodious blue-print room and a dark room adjoining. The south wing contains the main woodworking shop, 40x97 feet, a stock room, 30x40 feet, a carpenter shop, 20x40 feet, and the College printing plant, 40x50 feet. The east wing contains the machine shop, 40x80 feet, the blacksmith shop, 40x100 feet, store room for coal and iron, lockers, and toilet rooms.

The Foundry, which is located immediately south of the blacksmith shop, is built of brick. It contains one 22-inch Colliau cupola for melting iron, one brass furnace, one portable core oven, one stationary core oven for larger work, one twelve-hundred-pound crane ladle, one eight-hundred-pound crane ladle, and several smaller ladles. It contains also one crucible brass furnace, one two-ton jib crane, one post crane, one No. 2 Delano pulley molding machine, one tumbling barrel for cleaning castings, and a liberal supply of smaller tools, flasks, etc.

The Women's Gymnasium is situated about two hundred yards south of the Administration building, and is erected against a gently sloping bank on Jefferson street. The structure, 70x120 feet, is built of stone and wood, and comprises a high, airy basement, or first floor, facing east, with the main floor above it, having a bank entrance on the west end. The first floor of the building is devoted to locker rooms, dressing rooms, bathrooms, and offices, together with a rest room and a special room for corrective gymnastics. The second floor consists chiefly of one large gymnasium room, which is also frequently used as a lecture hall, assembly room, and social center for moderate-sized gatherings. This room, which comprises 8,000 feet of floor space, is surmounted by a balcony running track, suspended from the trusses. It affords facilities, in a court of 79x54 feet dimensions, for basketball, indoor baseball, tennis, and various winter and

indoor games. The building affords ample accommodations for the physical training of all the women of the institution.

The Men's Gymnasium is situated immediately west of Waldo Hall on Jefferson street, adjoining the main athletic field. The structure is to consist of four units, the central part being 90x150 feet, with each wing 52x96 feet in dimensions. The fourth unit will provide a swimming pool 50x100 feet, of modern design and finish. Only two units were completed during 1914, the main hall and the east wing. The main hall is used as a lecture and assembly room, or a place for entertainments when large audiences are to be accommodated. The showers and the baths are of modern design, providing hot and cold water throughout the year. The floor of the main hall with its 13,500 square feet of surface, provides space for three basketball courts, indoor baseball diamond, and space for various winter and indoor games. The east wing provides boxing and wrestling rooms, and an auxiliary gymnasium with special apparatus for use of the individual and for corrective gymnastics. When completed, the building will have accommodation for upwards of 2,000 men.

The Armory is situated about three hundred yards south of the Administration building. It is one of the largest of its kind in the United States and is built of concrete and steel, 126x355 feet. The drill hall portion has an unobstructed area of 36,000 square feet. The arms room, offices, and drill hall afford facilities for the accommodation of 1,000 men.

The Power Plant, a one-story brick building in the rear of Mechanical Hall, contains the requisite equipment for supplying the various buildings with heat, light, and power. The apparatus installed in this building serves the purpose also of demonstration equipment in these special lines.

The New Heating Plant, located at the south end of the Armory, is a one-story reinforced concrete building, with a concrete tunnel and conduits leading to the various buildings on the south side of the campus. It contains three boilers, one two-hundred-ninety, one two-hundred-fifty, and one one-hundred-fifty-five horse-power, with the necessary equipment for heating the buildings connected with it.

Waldo Hall, one of the women's dormitories, occupies a commanding site one hundred and fifty yards west of the Armory. It is a large building of striking appearance, with a cement founda-

tion and basement wall, and a cream-colored, pressed-brick superstructure, three stories high. The dimensions are 96x240 feet; and it contains one hundred and twenty-five rooms for students, besides a kitchen, dining room, and parlors. It is modern in all its appointments and finished throughout in natural grain Douglas fir, stained to conform to the color scheme.

Cauthorn Hall, the second of the women's dormitories, is a well-proportioned frame building, situated on a commanding spot in the western part of the campus. It is 160x50 feet, has three stories and basement, and contains sixty-two rooms, besides a large kitchen, dining room, and reception rooms. Its furnishings and appointments are adequate, modern, and in harmony with its use. Each floor is supplied with hot and cold water, baths, electric light, and steam heat.

Shepard Hall, the student building under the auspices of the Y. M. and Y. W. C. A., was completed at a cost of something over \$22,000. The original plans were somewhat modified, giving in many respects a better building than planned at first. This building contains in the basement a swimming pool, shower baths, lockers, banquet room, kitchen, wood room, and accessories. The first floor contains a large lobby which is used for a reading room, game room for social events, and general assembly. It also contains offices for the General Secretaries, a public office, a cabinet and check room combined, and a room for the Y. W. C. A. The second floor contains six rooms for the use of the literary societies, the Athletic Association, and the staffs of the different College papers. The third floor is devoted for the present to dormitory purposes. The building, known as Shepard Hall, is a fitting tribute to the memory of Clay Shepard, who gave his life to the cause of cleaner, higher, and truer citizenship as exemplified in student life.

Farm Buildings. The College Farm is now well equipped with farm buildings, and modern facilities for conducting practical and scientific work in animal husbandry.

The Dairy Barn is commodious, modern, and attractive in design. It is a frame building, with cement foundation and brick pilasters. The main part is 50x100 feet, two stories high, with two wings extending to the south, each 46x80 feet, one story in height. There is also a milk room, an engine room, and a fuel room. The building is utilized as a general barn, and will accommodate nine horses and seventy cattle, with sufficient space for

the storage of feed. On the first floor of the main portion are located the horse stalls, bins for storing the various grains and mill feeds, a seed room, and space for vehicles. The concrete basement is of sufficient dimensions to permit the storing of about one hundred tons of roots. The second floor has a storage capacity for one hundred tons of loose hay. A prominent feature of the barn is the cow stable. This is strictly modern, well lighted and ventilated, with concrete floor, thirty individual, tubular-iron adjustable stalls, and three commodious box stalls. The aisles are wide, and thus not only furnish an abundance of air space for the animals, but also afford visitors an excellent opportunity to view the stock. The milk and engine rooms are conveniently situated, but sufficiently isolated for proper sanitation. This building is lighted by electricity, well supplied with water, thoroughly sewered, and furnished with an elaborate system of bell traps. Adjoining this stable is a stave silo, built several years ago, and a new concrete silo, just completed, for use of the Dairy Husbandry department.

The old barns were moved and remodeled so as to harmonize with the new structure. They contain rooms for housing machinery, and a commodious piggery.

The New Cattle Barn. The department of Animal Husbandry is fortunate in having been able to erect a splendid new beef-cattle and sheep barn. It is located just west of the old barns, and has a floor space of 52x120 feet for sheltering stock. The hay loft has a storage capacity for 300 tons of hay and straw. Adjoining the barn are several concrete floored exercise lots. Especial conveniences are provided for the feeding, watering, weighing, and handling of live stock. The west half of the barn is at present devoted to beef cattle and the east half to sheep, although it is planned that the entire barn will eventually be used for beef cattle.

The Stock Judging Pavilion. The Animal Husbandry work of the College has been aided by the erection of a new judging pavilion, which provides very comfortable and commodious quarters for all of the demonstration work with live stock. The main room is 40x90 feet, well lighted, and provided with heat. A movable partition is provided whereby this large room may be divided into two smaller ones, each large enough for all ordinary purposes. The live stock work in the past has been very much handicapped

by crowded quarters without heat or good light, but these difficulties are now past and the department is in a position to do much better work than before.

Farm Mechanics Building. A modern building has recently been completed for the Farm Mechanics work. It is an attractive, well-lighted brick building, having a large operating floor, a class room, locker room, shop, and tool room on the first floor. This operating floor is of cement and is roomy enough for demonstration and for the operation of the heavier farm machines. Within this place is reserved space for the very heavy farm tractors. A gallery surrounds this operating floor and provides space for the lighter farm implements such as tillage, haying, and harvesting machines.

The building is equipped with shafting, belting, and power for the operating and testing of the various machines, and a large well is provided for making pump tests. A very complete equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest; so that the student has constantly before him and is working with and studying the very best classes of farm machinery of all types.

Representative machines are found in the laboratory as follows: plows, harrows, pulverizers, cultivators, plant setting machines, corn planters, potato planters, grain and grass seeders, mowers, rakes, binders, sprayers, manure spreaders, potato diggers, wagons, etc. Among the power machines are stationary gasoline engines, various types of pumps and pressure water systems, feed grinders, gasoline tractors, steam tractors, gang plows, and complete threshing machines. All of this expensive equipment is available to students in Farm Mechanics in the regular and short course work.

The Poultry Houses. On a ten-acre tract of land, lying south and west of Cauthorn Hall, there have been erected several buildings especially planned for the needs of the department of Poultry Husbandry. The main poultry building is a three-story structure and is used principally for class, laboratory, and demonstration purposes. It contains a demonstrating room with desks and other necessary equipment; a shop, with the necessary tools, benches, and equipment for practice work in building poultry plant equipment; storage rooms, office, and wash rooms are also provided. In the basement, rooms are provided for fattening and killing fowls, an incubator room for student use, and a feed room with the neces-

sary machinery for grinding and mixing poultry feeds. Besides the main poultry building there is an incubator house, with a capacity of twenty-four incubators and complementary apparatus; and a feed-storage building and a brooding house. There are also colony houses for laying and breeding stock and growing chicks. The colony houses are movable and constructed upon a plan that could be adopted by any farmer. The colony brooding coops are also portable, and are used for investigations in both natural and artificial brooding.

EQUIPMENT.

It is impossible, in the brief space that is devoted to this topic, to give more than a bird's-eye view of the equipment of the institution. The following data have been so arranged, however, as to give the prospective student a very good general idea of the comprehensive equipment that the institution possesses for carrying forward its designated work.

Agronomy. The Agronomy wing of the Agricultural building, and the Farm Mechanics building, provide large, well-lighted offices, class rooms, laboratories, storerooms, and other facilities for the work in Agronomy.

A large Soil laboratory is equipped with the necessary apparatus for the complete study of the physical properties of soils and problems of soil management. Ample desk room, supplied with running water, gas, compressed air, and electricity, is available for sections of fifty students each. Electric centrifuges and shakers, electric bridge for alkali testing, electric air baths, analytic and torsion balances, microscopes, blast lamps, aspirators, percolators, capillary tubes, mulch cylinders, soil sieves, scales, solution balance, compression filters, soil sampling tubes, etc., form part of the equipment for the work in Soil Physics. Soil surveying and mapping outfits, soil survey charts of the United States, and a collection of samples of the chief soil types of Oregon and the United States, are available.

A new Soil Preparation room equipped with benches, soil grinding and sifting machinery, large soil bins, and ample space for the drying, preparation, and storage of large quantities of the different soil types used in the laboratories, is available.

For the work in Field Crops, a large new laboratory on the second floor of the Agronomy building has been equipped with

special compartment desks for advanced work sufficient to accommodate sections of thirty students each, and additional benches sufficient to allow for laboratory classes of one hundred or more during the Winter Short Course period. This laboratory is furnished with an excellent equipment for all the courses in Crops, consisting in part of grain sampling and mixing machines, compound and binocular microscopes, dissecting microscopes, field lenses, germinating chambers and various types of plain and farm germinators, grain testers, grain grading apparatus, moisture testing apparatus, grain receptacles and storage cases of many kinds, and complete sets of seed, crop plant, and weed specimens. Each student is provided with samples of both the seed and the plants of different varieties of all the important field crops and weeds of Oregon and the United States.

The Seed Testing Laboratory, maintained jointly by the United States Department of Agriculture and the College, is in operation throughout the year. It is fully equipped for this work and is available for instruction of students specializing in Seed Testing.

A new Agronomy Exhibit Room and Museum has been provided and is being equipped for the coming year with exhibit cases and racks for the collections of grain, crop plants, weeds, soil samples, and other exhibits of interest and use in the different courses in Agronomy.

The work in Farm Mechanics is provided for in a separate building fitted with shafting and power and fully equipped with all classes and types of tillage implements; seeding, harvesting, pumping, and power machinery; farm engines and tractors of all kinds; self-registering dynamometer and other testing apparatus; shop; well; tools; forms for concrete construction; etc.

A laboratory for the work in draughting required in the various courses in Agronomy, such as Farm Drainage, Irrigation Farming, Farm Management, etc., is equipped with drawing tables, cabinets, blue-printing frames, etc.

For the work in Irrigation and Drainage, surveying instruments, tile and ditching tools, weirs, flume, hook gauges, water stage register, electric pumping plant, etc., are available. Weather recording instruments of different kinds supply equipment for the course in Climatology.

The Agronomy class rooms have demonstration desks, lantern

facilities, illustrative charts of various kinds, and a well-stocked reference library.

For field work, the experimental plots and fields on the Experiment Station farms and cooperative experiments at Corvallis and in other parts of the State offer an exceptional opportunity for study and comparisons in such work as plant breeding as applied to the different kinds of field crops; soil fertility rotations; use of commercial fertilizers; use of irrigation waters; effects of tile drainage on different types of soils; growing of different soiling crop sequences; production of high grade seed on a commercial scale; harvesting, manufacturing, and storage of crops; management of the fields and crops as to tillage operations, seeding, etc. With both the Experiment Station and the College farm operations under his eyes, the student may observe the experimental trial of a method of crop or soil management in the experimental plots and then the practical application of the successful method in the commercial production carried on in the fields of the College farms. The yearly results obtained in the Agronomic investigations at the branch experiment station farms at Moro, Burns, and other parts of the State, furnish the latest data and object lessons with reference to the dry farming and irrigation farming methods in other parts of the State.

Animal Husbandry. The equipment of the department of Animal Husbandry consists essentially of live stock, barns, and the College stock farms. During the past year the live stock available for illustration and demonstration purposes has been very much improved in numbers and in quality. The College flocks and herds now include typical specimens of Shorthorn and Hereford cattle, Cotswold and Shropshire sheep, Berkshire, Yorkshire, Poland China, and Duroc Jersey swine, Percheron, Belgian, Clydesdale, Shire, and Standard-bred horses, together with the live stock used in experimental work. In addition to the live stock regularly kept on the College farm, much good stock is loaned from time to time by the leading breeders of the State. During the winter carload lots illustrating the market classes are brought in for demonstration purposes. The department also possesses the necessary maps, charts, lantern slides, stud books, library, and other equipment for conducting laboratory, lecture, and recitation work in the several phases of Animal Husbandry. There is now in the department a very complete animal husbandry library.

Dairy Husbandry. The Dairy building, with its three floors and its newly remodeled manufacturing facilities, affords convenient and modern resources for the work of this department. In the manufacturing work, it is the intention to give the student theory and practice in the manufacture of dairy products. Commodious quarters are provided for this department in the Dairy building. The equipment is such as to permit handling milk and cream on a commercial scale, thus giving the student practice under actual factory conditions. On the first floor, are the offices and manufacturing rooms, the latter including a boiler room equipped with a 15 H. P. internal furnace boiler and a 10 H. P. Jewel automatic steam engine; a farm butter-making room, in which are found hand churns, butter workers, and the various types of separators found on the market; a churn room, which is equipped with modern ripeners, combined churns, various forms of butter-molding appliances, refrigerating machine, cooling room, and ice-cream freezer; a market milk room, with milk cooler, bottle-filling machine, and bottle washer; a cheese room, which is equipped with cheese vats, automatic pressure cheese press, and other equipment used in the cheese factory; a cheese curing room; and a reading room.

On the second floor, are located recitation rooms, and advanced and general laboratories. The latter will accommodate two hundred students in sections of forty each, and are equipped with a full line of appliances for testing milk and milk products. In the advanced laboratory, will be found moisture tests, salt tests, curd tests, and various other forms of apparatus suited to the needs of the advanced student. A circulating hot water system connects the wash sinks in all of the laboratories. Both steam and electricity are used for power purposes.

The College dairy herd consists of sixty-one head of choice dairy cattle of the Guernsey, Jersey, Holstein-Friesian, and Ayrshire breeds. These cattle are housed in a modern dairy barn.

Horticulture. The Horticultural wing of the Agricultural building contains many spacious rooms, and thoroughly modern equipment for teaching the various subjects. In the basement will be found a large spray laboratory furnished with gas and water and all the equipment, chemicals, and apparatus which are necessary to teach students the proper mixing and testing of the different sprays; accommodations are offered also for the testing of

nozzles and spraying apparatus. The department has a large number of hand and power spraying outfits that are placed at the disposal of students.

A large, well-lighted plant-propagation laboratory offers unexcelled opportunities for the study of plant propagation. Specially equipped cabinets, tables, and incubators have been constructed; so that the students can handle to advantage such topics as seedage, layerage, making of cuttings, and budding and grafting.

A laboratory has been especially fitted for the use of students in gardening. It contains large cement-set tubs, where students are taught the proper methods of preparing vegetables for market. This room also contains a demonstration earth bed for use during the winter, to show how the various tools for planting seed and for cultivation are used. The demonstration bed also allows the instructor to demonstrate the proper method of interplanting and transplanting of plants.

In the basement is also located a very large fruit-packing laboratory, equipped with fruit presses, packing and grading tables. The large storage rooms are also located in the basement and include a suite of rooms which are chilled by mechanical refrigeration.

On the first floor a systematic pomology laboratory is especially equipped for the study of nuts, fruits, etc. A special research laboratory, found on this floor, is used for research assistants in the department, and is also at the disposal of advanced students. This room is completely equipped with ovens, microscopes, and similar apparatus necessary for extensive research work.

On the top floor is the horticultural museum, which is found to be of great value, as in this room are stored all sorts of equipment used in Horticulture, such as pruning shears, budding and grafting utensils, prune-drying apparatus, fruit graders, etc. The department also has on this floor an herbarium which is especially supplied with the plants used in Horticulture. On this floor is also found a large draughting room, extending along the entire south end of the building, supplied with tables, cabinets, etc., for the use of students studying Floriculture, Landscape Gardening, and Greenhouse Construction, Orchard Planting, and Packing House Construction. In addition to these rooms, the department has four large lecture rooms. A balopticon with a good collection of

lantern slides, and a large library, add materially to the equipment.

The department is also especially provided with tools and apparatus necessary for conducting field exercises in Truck Gardening, Floriculture, Landscape Gardening, and Pomology.

Poultry Husbandry. The equipment of this department consists of a number of poultry houses of different types; about 1,000 fowls of several breeds and varieties; twenty incubators of several different makes; brooders of different types; hatching, brooding, and colony coops; bone and clover cutters; feed grinders and mixers; cramming machine and fattening batteries; trap-nests; and various other appliances necessary for practical poultry keeping. There are also sets of charts, lantern slides, motion pictures, and photographs, illustrating breeds of fowls, poultry farms, and houses.

Bacteriology. This department occupies new and commodious quarters on the fourth floor of the Agricultural building. It has much more room at its disposal than heretofore, occupying at present four large laboratories, besides an incubator room, a smaller room for a library, and a large storeroom. The laboratories for general and advanced Bacteriology are completely equipped for work in this science. Lead-topped desks, individual wall lockers, cylindrical and square copper sterilizers, supplied with steam from the main heating plant, small and large hot-air sterilizers, a small and large steam-pressure, horizontal sterilizer, the latter arranged for "dry steam" sterilization, are conveniently arranged in the general laboratory for the larger sections. Small incubators are used by the advanced students, while a large incubator room with automatic steam heat, is within easy access to both general and advanced laboratories. For special work demanding an extraordinary degree of exactness, there is a large electrically controlled and heated incubator. Lead-topped tables with convenient drawers furnish ample working space. Hot and cold water, which is supplied to all laboratories, is fed by the main water system and by a 40-gallon hot water tank. Sinks are uniformly lead. Each desk and locker is equipped with a complete outfit of microscopes and accessories. A high power centrifuge is used. There is a complete collection of common and precision glassware; and all the other necessary minor equipment for work in bacteriology is at the disposal of elementary and advanced students. There is a completely

equipped dark room fully fitted up for work in photomicrography. In connection with this room there is an arc lamp for illumination purposes for this work.

Botany and Plant Pathology. This department occupies the entire second floor of the Horticultural wing of the Agricultural building. Besides three general student laboratories, a special laboratory for plant physiological work and an herbarium room, which is also used as an instructor's preparation room, are provided. This latter room is equipped with desks for special and graduate students. A large, well-lighted laboratory is provided for the experimental work in plant pathology. A small room for the department library and records is used also as an office for the instructors. A special physiological dark room for experimental work in plant physiology is provided. The student laboratories are equipped with large student tables, each of which will accommodate four students. Compound and dissecting microscopes are provided for each student. The physiological laboratory is equipped with the essential apparatus for modern laboratory courses. The research laboratory in Plant Pathology has the most modern equipment available.

The phanerogamic herbarium of several thousand mounted and many thousand unmounted plants is particularly rich in Oregon forms, while containing quite extensive collections of the New Mexico, California, Michigan, and Washington floras. The herbarium is being rapidly enlarged by purchase and exchange; particular attention is being given to the accumulation of economic material, including the forest and shade trees of North America, agricultural plants of the world, pharmaceutical plants, and weeds and grasses of economic importance. Large and miscellaneous collections of the various groups of cryptogamic plants are being assembled. Particular attention is being given to the collection of parasitic fungi, for use in the work in Plant Pathology. A private collection of about five thousand specimens of fungi particularly rich in parasitic forms has been temporarily loaned by Professor H. S. Jackson for the use of students and instructors.

A large amount of class study material is preserved in alcohol for the use of students. A well-selected collection of microscopic slides, photographs, lantern slides, and charts is provided and is being rapidly enlarged.

Veterinary Medicine. This department has its office, labora-

tory, and lecture room on the second floor of the Dairy building. Laboratory equipment includes mounted skeletons of the horse and cow, complete sets of loose bones, dissected specimens preserved in museum jars, rotary microtome with accessories, microscope, electric oven, electric thermostat, steam and hot air sterilizers, the necessary glassware for physiological laboratory work, and the necessary instruments and drugs for chemical work.

Zoology. The laboratories of this department occupy the following rooms on the third floor of Agricultural Hall: offices, physiological laboratory, laboratory for embryology and histology, general laboratory for zoology, lecture room, vault and photographic dark room. The general laboratory is equipped with desks with individual drawers to accommodate 280 students; each desk is provided with compound microscopes, dissecting microscopes, and various minor pieces of apparatus. The physiological laboratory is similarly equipped for 225 students and in addition is provided with an articulated skeleton, a dissectible human skull, a complete Azoux model of the human body, greatly enlarged Azoux models of the brain, eye, ear, and other organs, a set of the celebrated Leukart zoological charts, and a good supply of specimens and dissections for illustrating the work in physiology. The laboratories are provided with high grade compound and dissecting microscopes, a Minot rotating microtome, a Minot automatic precision microtome, water bath, 5x7 view camera, laboratory balances, eyepiece, and stage micrometers, and an abundant supply of minor instruments.

The museum contains, in addition to a beautiful collection of native birds, a small collection of mounted mammals, the Ladd collection of bird skins, a large collection of eggs of native birds, a small collection of fishes and reptiles, a considerable number of marine invertebrates, including a small but beautiful collection of Philippine shells, and numerous specimens of a miscellaneous nature.

Entomology. This department now occupies three rooms on the third floor of Agricultural Hall—one office, one laboratory, and one class room. The entomological class room is equipped for twenty-four advanced students. It also contains the entomological collections and extension materials. The research laboratory is fully equipped with up-to-date apparatus for carrying on all kinds of research problems. The entomological library is exceed-

ingly rich in old volumes and complete sets of entomological periodicals. Through the kindness of the librarian of the U. S. Department of Agriculture, students in this department have access to all publications contained in the library of the Department of Agriculture and the library of Congress.

Forestry. The School of Forestry has an herbarium of the forest trees of the Pacific Coast, a cone and seed collection representing the important commercial trees of the United States and a collection of the important commercial woods of the United States. It has apparatus for applying preservatives to timbers by the open-tank method, timber-testing machinery, incubators for testing tree seeds, wood specimens, stereopticon and slides, compound and low power microscopes, hypsometers, increment borers, scale sticks, calipers, Biltmon sticks, transits, surveyors' compasses and chains, pack outfits, axes, saws, draughting tables, and other equipment necessary for efficient laboratory and field work. Valuable collections of tools used in logging have been loaned the department by several commercial companies. The City Water Company of Corvallis has placed a timbered tract of eighty acres at the disposal of the College for demonstration purposes, while the entire city watershed of more than 7,000 acres is used as a basis for practical field work.

Domestic Science. This department is located in the new Home Economics building and occupies the basement, first floor, and one-half of the second floor of the completed east wing of this structure. There are five large laboratories, with excellent modern equipment for all types of food preparation. A small laboratory is equipped with various kinds of cooking apparatus and is designed for experimental work. Adjoining the experimental laboratory is a dining room large enough to accommodate twenty people. This is used for meal serving and enables the students to put into actual practice the knowledge gained elsewhere.

The laundry in the basement is supplied with modern conveniences and labor-saving devices. Ample class rooms, locker rooms and rest rooms are provided for the use of the students in the Home Economics course.

Domestic Art. The entire third floor and half of the second floor of the new Domestic Science wing of the Home Economics building is allotted to the work in Domestic Art. There are six large laboratories with locker and dressing rooms adjoining each.

The rooms are supplied with the best type of equipment available. The most improved sewing machines, good electric irons, ample wardrobes for unfinished work, and large display cabinets for finished work, are conveniently arranged. Excellent exhibit cabinets for the educational collection of cotton, wool, silk, and linen have been supplied.

Civil and Highway Engineering. In addition to joint use with the other engineering departments of the testing laboratories described elsewhere, this department has a suite of well-lighted rooms, suitably arranged on the second floor of Mechanical Hall. This suite includes an office, recitation, and lecture rooms; an instrument room, and draughting and designing rooms, together with a well-equipped blue-print room with a cylindrical electrical blue-print machine, sun frames, and washing pans.

The draughting and designing rooms are well lighted and fully equipped with thoroughly modern and convenient drawing tables, supplied with individual lockers for instruments and other apparatus. The instrument room is conveniently arranged, having an individual glass-front case for each instrument and its accompanying equipment, which includes marking pins, tape, range-poles, notebook, etc. The instrument equipment includes the following: twelve transits, four of which are provided with solar attachment; eight levels, four plane-tables, one compass and two current meters, all high-class instruments of various standard makes and styles; a sufficient supply of level and stadia rods, range-poles, tapes, chains, plain and prismatic compasses, aneroid barometers, clinometers, planimeters, plumb-bobs, hand levels, etc., together with a well-selected assortment of specifications and blue print plans of engineering structures for illustrative purposes.

Irrigation Engineering. The excellent equipment of the Civil, Highway, and Experimental Engineering departments, as described elsewhere under this caption, is available for use by the students in the Irrigation Engineering department. Besides the draughting rooms and laboratories, the student has the use of transits, levels, plane-tables, current meters, and tapes for practical work, as well as pumps, water meters, rams, and small water wheels of the Experimental Engineering laboratories for experimental work. Facilities for experiments with small weirs, orifices, and devices for measuring irrigation water are provided.

In addition to the above facilities, the proximity of the Wil-

lamette and Mary's Rivers, Oak Creek, and the mill race of the Corvallis Flouring Mills, affords excellent opportunity for practice in stream gauging.

Electrical Engineering. The laboratory of this department occupies a large part of the west half of the first floor of Mechanical Hall, and is divided into several rooms, one for testing, one for instruments, and another for supplies. Besides the equipment therein, including generators, motors, and other apparatus, the machinery in the College Power Plant and sub-station, is available for study and testing purposes. Three-phase electrical energy is supplied by the long distance transmission line or by the local generating unit as desired.

In the laboratory is a $6\frac{1}{2} \times 15$ foot switchboard, consisting of three asbestos wood panels on which are mounted a number of voltmeters and ammeters for direct and alternating current; a power factory meter; a frequency meter, and synchroscope; a set of synchronizing lamps; circuit breakers; switches; and a large number of plug terminals, the leads of which extend to the four machine platforms; two slate panels with instruments and switches for direct current machines; and an arc light regulating panel. Immediately adjacent thereto is a controller, auto-transformer and rheostat rack, six feet high by sixteen feet in length.

The machine platforms just mentioned are four feet wide by fourteen feet long, and have upon them the following equipment: one five, one seven and one-half, one ten, and one fifteen horsepower, three-phase, induction motors; two five, two seven and one-half, two ten, and two twelve and one-half kilowatt, 125-volt direct current generators; one ten-kilowatt double current generator, and one two-kilowatt rotary converter; two two and one-half kilowatt induction motor generator sets; one two and one-half kilowatt synchronous motor generator set; one seven and one-half kilowatt revolving field alternator, with three additional rotors, and one seven and one-half kilowatt revolving field alternator, from both of which current of one-, two-, three-, four-, and six-phases may be taken; one five-arc light regulating, one ten-kilowatt 110,000-volt high tension testing, one ten-volt 1000-ampere welding, one five kilowatt 15,000 volt wireless, three $7\frac{1}{2}$ kilowatt, 2200-220,110-volt transformers with ten taps each in the secondary, giving nine different voltages from 24 to 220 volts, with 87 per cent taps in both primary and secondary for transformation from three-

to two-phases or the reverse, and a number of ordinary transformers and compensators.

The instruments available comprise standard portable volt, ampre, and watt meters which are divided into two groups, one of which is used for routine laboratory work, the other reserved for thesis and other tests in which greater accuracy is desired. In addition to this equipment, the departments of Physics and Electrical Engineering maintain an instrument standardization laboratory equipped with two one-hundred ampere storage cells and a group of dry cells to furnish potentials up to one hundred and fifty volts. The precision instruments and apparatus consist of a Leeds and Northrup potentiometer with certified standard cells and a complete line of standard shunts from one one-thousandth to ten ohms, a Weston laboratory standard voltmeter with ranges of 1, 100, and 200 volts and Siemens and Halske laboratory standard ammeters with ranges from 2.5 to 50 amperes and a similar wattmeter with five and ten ampere range.

Mechanical Engineering. The laboratory equipment for this department in mechanics and power measurement, is described under Experimental Engineering. The shops are under the supervision of the department of Industrial Arts.

In addition to equipment listed under these two departments, there are two large draughting rooms, each with 40 drawing tables, drawing boards for each student, and a blue-print room, with printing frame, wash trays, etc.

Experimental Engineering. Appropriate portions of the equipment for this work are utilized by all departments in Engineering and Forestry. The equipment comprises the following divisions: a materials testing laboratory, a cement testing laboratory, a steam laboratory, and a gas engine and hydraulic laboratory. These divisions have in common the equipment for the preliminary work, such as calculating devices, planimeters, Amsler integrator, micrometers, and other general apparatus.

The materials testing laboratory occupies the northwest corner of the first floor of Mechanical Hall and contains the following: a 150,000-pound Riehle universal testing machine fitted with extension table for beams up to 16 feet in length; a 50,000-pound Riehle automatic and autographic testing machine; a 60,000-pound-inch Olsen torsion testing machine; a 400-foot-pound drop testing machine and a static load testing machine, both of which were built

in the College shops; a Case tempering furnace with pyrometer; Scleroscope and Brinell ball hardness testers; and auxiliary apparatus including a deformeter, torsion indicator, compression micrometers, several extensometers, deflectometers, and other minor pieces.

A part of the materials laboratory also is devoted to the testing of materials for highway construction. This equipment includes the following: Olsen impact machine for toughness tests; Riehle machine for hardness tests; ball mill, molding machine, and impact machine for cementing value tests on rock dust; rattler for abrasion tests on macadam or paving-rock, another for paving-brick; core drills and saw for cutting stone specimens; shakers and sieves for mechanical analysis of sand and aggregates, including a set of Tyler standard screen scale sieves; penetrometer, viscosimeter, float test, centrifuge, and other appliances for making physical tests of bituminous cements and road oils.

The cement testing laboratory, also located in Mechanical Hall, is equipped with convenient glass-topped tables for mixing, intended to accommodate six students each. Apparatus is provided sufficient for making all the standard A. S. C. E. tests, as well as for some additional experiments. There are a large number of briquette, cube, and special cylinder molds, three Vicat needles, Gillmore needles, screens, including a standard set, damp closet, aging tanks, boiling test apparatus, autoclave, briquette molding machine, a 1000-pound Fairbanks cement testing machine, permeability apparatus for testing various mixtures or water-proofing compounds, and small apparatus including balances, specific gravity flasks, trowels, sampling irons, etc.

The steam laboratory, located in the New Heating Plant, contains the following machines: a 7x8 throttling engine used principally for experiments on valve setting, a 9x10 Ideal automatic high-speed engine driving a 30 KVA, 3-phase generator, a 15 BHP, two-stage Kerr tribune, an 8x18 simple Murray Corliss engine, and a 6- $\frac{1}{4}$ and 10- $\frac{1}{2}$ x6- $\frac{1}{4}$ Sturtevant vertical compound engine. The last three of these are so arranged that they may be run either condensing or with atmospheric exhaust. The condenser and vacuum pump are so equipped that the cooling water may be measured by means of a Venturi meter and the condensed steam by a Kennicott water-weigher. The engines are all fitted with

gauges, sampling pipes, indicator connections, and brakes of various types.

For tests on boilers and their auxiliaries there are available the equipments of both the new and the old heating plants. The former consists of three Flanner water-tube boilers aggregating 700 horse-power; these are oil fired and fitted with modern auxiliary equipment, including feed water and oil meters, thermometer wells, flue gas sampler, etc. In the old plant there are three fire-tube boilers of about 170 horse-power total capacity, for which cord wood, and waste from the College wood shop are used for fuel.

Of smaller power laboratory equipment there may be mentioned a General Electric steam meter, pressure gauge tester, Schaeffer and Budenberg indicator calibrating device, seven indicators including a Trill instrument for continuous diagrams, several reducing wheels, two steam calorimeters, flue gas analysis apparatus, two pyrometers, draught gauges, recording and indicating pressure gauges, etc.

For work on power transmission, a transmission dynamometer and a special belt testing machine are provided. Tests may also be made on lubricants, bearing metals, and different types of bearings, by means of a Golden bearing and oil dynamometer, or a pendulum type oil testing machine. There are also at hand the usual minor pieces, as flash point apparatus, viscosimeter, etc.

The gas engine and hydraulic laboratory is located in the old Power Plant building. The gas engine equipment consists of three four-cycle and two two-cycle gasoline and oil engines, and an 8-inch Reeco-Ericson hot-air engine. All of these are especially fitted for testing and demonstration. In the same room are also installed a Gardner air compressor and two centrifugal blowers for work on air compression and transmission. The hydraulic section contains the following: a centrifugal pump driven by a rated variable speed motor, several steam pumps, a 4x6 Goulds triplex pump, 12-inch Doble laboratory water motor, hydraulic ram, 2-inch Venturi meter, current meter, two ordinary service meters, calibrating tanks, orifice boxes with suitable plates and orifices, weirs, hook gauge, and other small apparatus. In addition to work in the laboratory, measurements and tests of neighboring streams and installations may be made.

Industrial Arts. This department provides the necessary equipment for carrying on the different lines of shop work in the degree and vocational courses.

The Wood Shop, supplied with the best machines and tools the market affords, contains twenty-four double benches of modern design, accommodating forty-eight students. Each bench is provided with patent rapid action vises for holding the work, and is furnished with two sets of hand tools, consisting of rip saws, cut-off saws and backsaws, planes, chisels, paring gouges, marking gauges, try-squares, hammers, dividers, and oilstones. The machine equipment of this shop consists of fifteen wood-turning lathes, each furnished with a set of tools; one iron saw-table with rip and cut-off saws, one band saw, one jig saw, 24-inch surface planer, 16-inch glue joiner, post boring machine, and two grindstones. There are also two glue tables with clamps of various sizes and one steam and gas glue heater of three gallons capacity. The power is furnished by two three-phase induction motors of 15-horse-power each.

The Forge Shop contains forty-two down draught forges of the most improved pattern. Blast is furnished by a steel pressure blower driven by a 10-horse-power induction motor, and the smoke and gases are removed by an 80-inch exhaust fan, driven by a 20-horse-power motor. Each forge is provided with anvil, hammers, hardies, tongs, and other small tools. There are also swedge blocks and vises at convenient points in the room for general use.

The Machine Shop contains one 24x24-inch iron planer, one 15-inch shaper, one 12-inch shaper, one universal milling machine, one universal tool grinder, one wet tool grinder, one radial drill, one 20-inch drill press, one sensitive drill press, one 20-inch engine lathe, one 16-inch engine lathe, one 16-inch universal turret lathe, one 14-inch modern geared lathe, five 14-inch engine lathes, two 10-inch speed lathes, one shop saw, one automatic knife grinder, and twelve bench vises. A 20-horse-power induction motor furnishes the power. A tool room adjacent contains the small tools, such as twist drills, taps, dies, reamers, calipers, gauges, and scales. These tools are given out to the students on the check plan.

The Plumbing and Steam Fitting Shop is equipped with all of the hand tools necessary for cutting, threading, and general pipe work, as well as gasoline torches, soldering outfits, and other apparatus for making lead pipe connections and wiped joints.

The Foundry contains a 22-inch Colliau cupola having a capacity of two tons per hour, one 1200-pound crane ladle, one 800-pound crane ladle, bull ladles, and hand ladles, one 16-inch brass furnace, brass molder's tub, crucibles, one large core-oven, one portable core-oven, one two-ton jib crane, one wall crane for charging floor, one Delano pulley molding machine No. 2, besides shovels, rammers, and small tools to accommodate twenty students at one time.

Mining Engineering. The new Mines building provides spacious and well-lighted offices, laboratories, and lecture rooms for work in this department.

The Assaying and Metallurgical laboratory is a cement-floored room 30 feet wide and 60 feet long on the first floor of the building extending across the entire east end. It is amply lighted by windows on one side and both ends. At the south end of the room are the most modern type of oil and gasoline furnaces for fusion and other fire work. Conveniently arranged nearby are suitable lockers and work tables with the necessary tools, fluxes, etc. The north end of the room is adequately equipped with sinks, ventilating hoods, gas burners, electric hot plates, and other apparatus for carrying on the various operations involved in parting buttons, assaying solutions, making cyanide tests, etc. One corner of the laboratory is partitioned off for a balance room and provided with the most delicate balances obtainable for weighing the gold beads. Balances of both the Keller and Ainsworth makes are available. These are mounted on a specially constructed table not connected with the floor, in order to avoid vibration.

The Crushing and Sampling laboratory in the basement is 25 feet by 30 feet. It contains a power-driven sample crusher of the latest design and one of the recently modeled disk grinders, for properly pulverizing samples for assay or other purposes. The usual bucking board and muller and other hand grinding devices are also available for student use at any time, together with the Jones sampler and other appliances used in preparing samples. Such work will all be done here, so as to avoid dust in the assay laboratory.

The Ore-Testing laboratory is a room 25 by 30 feet on the first floor of the building. It is equipped with appliances for studying the behavior of ores when subjected to the various concentrating operations of jigging, vanner, table, and magnetic concentration.

The Ceramic laboratory occupies a room about 30 by 60 feet in the basement of the Mines building. There are also store and supply rooms contiguous to this laboratory. The equipment for the ceramics work consists of a laboratory for ceramic chemistry and apparatus for making physical tests of clays and other ceramic materials; a complete mechanical outfit for the preparation of clays for the manufacture of brick, tile, terra cotta, etc., and equipment for compounding of bodies, glazes, enamels for stone- and ironware, and all of the higher grade of pottery and porcelain. This outfit includes a combination dry-wet-pan, pug-mill, blunger, filter press, ball mills and other grinding machines, rolls, screens, potter's wheel, and an auger machine provided with dies for side- and end-cut brick, hollow block, drain tile, and roofing tile; a hand-power screw press with dies for dry press brick and flat tile; and an electric furnace for high temperature work.

In the ceramic laboratory are two kilns, a down-draught burning crude petroleum, and a Caulkins muffle pottery kiln; a steam dryer in which drying conditions can be accurately controlled; an electric and a radiation pyrometer; Seger volumeter; balances and other necessary apparatus.

A ceramic library which contains the best works in both English and foreign languages and a ceramic museum are also important features of the working equipment of the department.

The Geological and Mining Museum on the third floor is fitted up with twelve glass-top cases and sixty feet of wall cases, in which are exhibited large and attractive specimens of minerals, rocks, and fossils, not only from our own State, but from all over the United States. In the museum will also be found collections of manufactured geologic products, including samples of all the different grades of brick, tile, pottery, terra cotta, and cement manufactured products, together with the raw materials from which the same are manufactured.

The Mining Draughting room is equipped with convenient desks and tables and all necessary equipment for the use of mining students.

The Mineralogical laboratory possesses the following collections:

No. 1, the Mineral Type Collection, consisting of about 1500 characteristic and labeled specimens used by the students for the purpose of study and comparison.

No. 2, an Exhibit Collection of minerals, consisting of large and attractive specimens.

No. 3, a Working Collection of minerals, consisting of about 7000 unlabeled specimens similar to those in the Type Collection.

No. 4, a Crystal Collection, containing about 1000 natural crystal forms.

No. 5, a Crystal Model Collection, consisting of 48 large glass crystal models and about 750 smaller wooden models used by the students in the study of crystallography.

No. 6, a Blowpipe Collection, containing minerals and metals used in blowpiping.

The Petrological laboratory contains the following collections:

No. 1, the Rock Type Collection, consisting of about 350 characteristic labeled specimens used by the student for the purpose of study and comparison.

No. 2, the Working Collection of rocks, containing about 2000 unlabeled specimens for the use of the students in the work of petrology.

Commerce. The School of Commerce, which occupies the top floor of the Agronomy wing of Agricultural Hall, is completely equipped for thorough and efficient work in modern business courses. Each room is specially designed and furnished for the work to be conducted in it. The furniture of the department consists of individual desks and counters, a complete set of modern banking fixtures, a wholesale house, a retail house, a commission house, freight, real estate, and insurance offices. Permanent blank books, letter files, rubber stamps, copying presses, college currency, blanks, and similar material are provided by the College. A Burroughs Adding Machine is in constant use in the department. The room for typewriting contains twenty standard machines, each provided with approved conveniences for the operator. The room for stenography is furnished with tables designed for conveniences in practical work, as well as in equipment for illustrating various systems of filing. The department of Economics and Sociology is developing a commercial museum for use in the various courses in social science.

Pharmacy. The department's lecture rooms and laboratories are in Science Hall, a building which conveniently meets the needs for space, light, and ventilation.

The laboratories and lecture rooms are well equipped with all

requirements necessary for practical instruction in pharmaceutical manipulation. Each laboratory is thoroughly equipped for a definite kind of work and the stock of the department is so complete that students have every opportunity to do efficient work. Students have individual desks supplied with a complete set of apparatus. Nearly all stock used by students is found on side shelves directly in the laboratory. All drugs not found on side shelves are obtained from the stock which is in charge of an assistant at all times during laboratory periods. This system for the distribution of drugs and apparatus to students works for the highest efficiency. Much of the student's time is saved thereby.

In addition to the usual permanent fixtures and apparatus for individual students, the department is supplied with a number of pieces of special apparatus for common use, such as pharmaceutical stills, tablet and pill machines, suppository machines, filter presses, and all of the apparatus that is necessary for thorough instruction in pharmacy. The prescription room is really a model drug store, containing accurate balances, capsule fillers, conceal molds and such other apparatus as is necessary. The room for commercial pharmacy is equipped for sign-card painting and window dressing. Special tables for frames have been built for the work and each desk is supplied with compressed air for work with the air brush. The pharmacognosy room contains many cabinets filled with crude drugs, active principles, and many preparations. There is also the Eli Lilly & Co. exhibit of authentic crude drugs and preparations.

The pharmacy library contains the leading pharmaceutical journals, which are kept on file and are accessible to students. Students also have access, with certain restrictions, to all standard reference books on materia medica, chemistry, and pharmacy.

Art. The department occupies three commodious, well-lighted, studios on the fourth floor of Agricultural Hall, and one class studio on the second floor of the same building. The rooms have north light, are well heated and ventilated and are equipped with suitable studio furniture, and accessories such as casts, still life and prints. The department is also well supplied with wall drawings, pictures, and portfolios illustrating the different phases of the work.

The College Library has a well selected and growing reserve in art and architecture, covering all branches of the subjects.

Chemistry. The department of Chemistry occupies nearly the whole of Science Hall, except the fourth floor, which is occupied by the department of Pharmacy, and a few rooms on the third floor that are at present used by the School of Forestry. The Chemical department of the Experiment Station has four rooms on the second floor.

The largest room in the building is the main general laboratory, which will accommodate 550 students in four sections. Adjacent to this laboratory is the general stock room, that in itself is a division of the department. It is well stocked with all the necessary apparatus and chemicals required for all the courses given in the department. One of the greatest improvements in the Chemical department is the new gas machine; this, when working at its full capacity, can supply gas for 800 burners.

The new organic laboratory has been increased in size until it now contains room for 240 students. The equipment is of the best.

The new qualitative analysis room now has accommodations for 96 students in four sections. Its equipment of hot and cold water, gas, pressure pumps, etc., makes it as good as the best.

The quantitative analysis room can accommodate 50 students in three sections. Great pains have been taken to make this room as nearly an actual chemical work room as possible.

In the balance room there are 23 analytical balances, most of which are used by the students in agricultural chemistry, and in food chemistry.

The main lecture room which is situated on the third floor, has a seating capacity of 150. It is provided with lecture tables that are supplied with gas, electricity, and water. Adjoining the lecture room is a small preparation room, in which is kept all special apparatus used for lecture demonstration, as well as supplies for the agricultural laboratory. This room is equipped with all the necessary apparatus for the proper elucidation of the principles of this branch of chemistry.

For the work in Agricultural Chemistry, an entire room is set aside. This room is fitted with gas, water, and electricity; condensers for distilled water; batteries; extraction apparatus for fats; nitrometers; Kjeldahl apparatus; hot water filtering apparatus; grinders for fodders, steam and air baths, calorimeter, polariscope, Westphal and analytical balances; coarse balance for rough work, hot-plates, and minor apparatus. This is one of the strongest divis-

ions in the department and is lacking in nothing that makes a fully equipped agricultural chemical laboratory.

Physics. The physical laboratory has a good working equipment for the study of general physics, the apparatus being such as to allow a qualitative or quantitative verification of the most important laws of physics by the student in the laboratory, and by the instructor in the lecture room. In addition to the general laboratory, the department has two special laboratories, one equipped for electrical measurements and the other for photometry. A partial list of the apparatus found in these follows: standard cells, shunts, capacities and inductances; secohmeter; Leeds and Northrup potentiometer; Siemens and Halske standard ammeters, voltmeter, and portable testing set; Paul unipivot testing set; storage cells of large current capacity for ammeter and wattmeter calibrations; 10½-inch spark coil; Gaede pump; large Tesla coil; Leeds and Northrup photometer fitted with lamp rotator, rotating sector, Lummer-Brodhum screen, and Bechstein flicker photometer.

The Women's Gymnasium is equipped with lockers and dressing rooms having accommodations for every College woman. A room for corrective gymnastics and a rest room, on the ground floor, are adequately equipped for their respective purposes. In the shower-bath room, hot and cold water is available throughout the year, and free towels are furnished to the students. The floor of the gymnasium is surrounded by a balcony running-track, and a capital playing space is provided for basketball and other indoor games.

The equipment includes horizontal bars, vaulting horses and bucks, parallel bars, swinging rings, traveling rings, Swedish box, stall bars, climbing ropes, ladders, dumb-bells, Indian clubs, and wands.

The girls' athletic field provides facilities for such games as baseball, cross ball, basketball, soccer, field hockey, and tennis.

The Men's Gymnasium is equipped with lockers and dressing rooms having accommodations for all of the men of the College. In the shower-bath room, hot and cold water is available throughout the year, and free towels are furnished to the students. The main floor space provides for basketball and other indoor games. The equipment includes horizontal bars, parallel bars, vaulting horses and bucks, swinging rings, traveling rings and ladders, Swedish wands and stall bars, climbing ropes, mats, dumb-bells,

Indian clubs, and chest weights. The athletic field adjoining the gymnasium on the south, has within its bounds a quarter-mile running track, football gridiron, and baseball diamond. Bleachers and a grandstand accommodate the spectators.

THE EXPERIMENT STATION.

The Agricultural Experiment Station bears an important relation to the College, as the scientific investigations conducted by the staff strongly support the instruction given in the class room and through the extension service. Aside from the original investigations of economic significance to agriculture, the work of the Station affords daily object lessons in modern farm methods.

About 300 acres of land are devoted to the use of the Station workers. This land is utilized by the various departments represented in Station organization, including the departments of Chemistry, Agronomy, Horticulture, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Entomology, Bacteriology, and Botany and Plant Pathology. Each department is actively engaged in the scientific investigation of problems presented by the different branches of agriculture.

As an illustration of the comprehensive character of this work, the following investigations, taken at random from the list of those now being conducted by the Station workers, may be cited. The value of such work, as an object lesson to the students in the various fields of agriculture, can hardly be overestimated. There are experiments with long and short rotation systems for the improvement of soil fertility; tests to determine and develop the best varieties of corn for Oregon conditions; tests to ascertain the adaptability and value of alfalfa for soiling and pasture; tests to determine the adaptability of kale as a winter succulent feed for dairy cows and other stock; experiments in the making and feeding of silage; experiments in breeding wheat for increase in both quantity and quality of yield, and improvement in adaptation to soil and climatic conditions; experiments in testing the value of irrigation in Western Oregon for general farm crops; tests for comparing the merits of Loganberries and phenomenal berries; tests in utilizing fruit and vegetable by-products, with especial attention given to the Loganberry; variety tests of strawberries; experiments in cross pollination of apples; investigation of bacterial gummosis of the cherry; a study of the effects of the lime-

sulfur spray under varying conditions; investigations of apple tree anthracnose; peach spot, potato blight, and celery leaf blight; investigations as to the relation of speed, the temperature, and the fat content of milk, to the cream produced by cream separators; cooperative investigations with the department of bacteriology relative to the best manner of using "cultures" in butter and cheese making; breeding for egg production; experiments in incubation to discover, if possible, the cause or causes of the great losses in artificial incubation; comparisons between hen-hatching and incubator-hatching; the humidity conditions of natural and artificial methods; carbonic acid gas as a factor in incubation; feeding experiments to determine the value of various forage crops and cereals for the growing and fattening of hogs; experiments in the feeding of dairy cows; experiments in grazing and fattening swine; investigations in the economical production of beef and mutton.

COLLEGE ORGANIZATIONS.

One of the most important factors in rounding out the results and benefits of a college course is the society, club, or association work. As a result of the diverse interests of college life and the varied tastes of the students, the following organizations, and many others, are maintained by students and faculty:

The Student Body Assembly. This is an organization of the entire student body, working under a constitution and by-laws approved by the faculty, and having general authority over all student enterprises. In order to secure an effective administration of the business coming within its jurisdiction, there are permanent committees on athletics, publications, oratory and debate, and such special committees as the assembly may by vote determine. Officers are elected yearly, and nominations and elections are conducted in a manner similar to that of the State electorate.

Student Self-Government. A system of student self-government has been established at the College which places the general disciplinary powers of the institution in the hands of the students. The Student Council, an organization made up of thirteen students, seven of whom are seniors, three juniors, two sophomores and one freshman, has been created and vested with such powers as are necessary to enforce the rules and regulations adopted by

the students. Members of the Student Council are elected annually by popular vote of the student body.

The Literary Societies. These six organizations—Utopian, Clinonian, and Hesperian, for women; and Zetagathian, Athenaeum, and Shakopean, for men—have the common purpose of promoting literary work among the students. The weekly literary programs and occasional joint meetings tend to this end. The Shakopean is essentially an honorary society, membership depending upon honors won in debate or oratory at the College. To stimulate interest in debate and oratory, there are held during the year intersociety, intercollegiate, and interstate contests. Gold medals and cash prizes are presented to the winners in the contests, and the successful society in debate receives the "Gatch Cup." This is the silver cup that was presented in 1901 by Dr. Thomas M. Gatch, then president of the College, to the society that had received highest honors in the season's debates. Annually this cup is to go to the successful society in debates, but it is ultimately to become the property of the society winning it three years in succession. Many and determined have been the battles for its possession, but the cup is still without a permanent home.

The Christian Associations. The religious work of the College is well cared for by the Young Men's and Young Women's Christian Associations, these organizations being particularly strong. The construction of Shepard Hall, the student community building, has materially increased the scope and added to the effectiveness of the work. The Associations aim to provide a moral atmosphere and pleasant social advantages for the students. Religious meetings are held in the rooms of these organizations every Sunday afternoon, and Bible study classes are regularly conducted. On registration days, committees are on hand to assist students in adjusting their work satisfactorily, and in securing comfortable quarters in good homes. Those who wish to make their way through College, will find the employment agencies of the Associations always ready and glad to assist them as far as possible in procuring positions.

The Athletic Association. This organization, maintained by the students through the student body assembly, encourages wholesome competition in the various outdoor and indoor sports and pastimes. It has charge of all details pertaining to the conduct of intercollegiate athletics in which the College may be interested. A

committee of the faculty has general supervision over the whole subject of athletics, thus insuring a sound and conservative management.

College Folk Club. This club was organized in October, 1908; membership is open to all women of the faculty and other women employees of the institution, and to the women members of the immediate families of the faculty and other employees. The object of the club is social diversion, general culture, and the promotion of the best interests of the College and the community. The organization at this time is divided into three sections: Art and Music Section; Sociology Section, and Mothers' Section. Aside from the semi-monthly meetings of the various sections, the general club convenes on the first Saturday of each month, at which time an address is given by an outside speaker, or a musical or literary program is furnished by members of the club, to which the public is invited. In January, 1913, the organization became affiliated with the Oregon State Federation of Women's Clubs. It is the purpose to so extend the work of the club as to effect the greatest possible good to the College and to the city.

The Mask and Dagger. This club was organized for the purpose of offering special training in dramatic art. A semi-annual "try out" is held in which all students of the institution may participate, and any who possess talent in this direction may be elected to membership in the club. No student, however, will be permitted to take part in a public production who has not an average for all of his College work, at the time the play is being prepared, of 80 per cent. Platform exhibitions will be given and standard plays presented during the College year.

The Oratorical Association. This body has immediate charge of all business pertaining to the competitive work in oratory and debate. Schedules, dates, prizes, conditions of competition, and all similar matters are in its care.

Intercollegiate Debate and Oratory. Each year the Oregon Agricultural College has at least one intercollegiate debate, putting into the field two teams, one supporting the negative and the other the affirmative of the same question. The College sends one representative each year into the old line State Oratorical Contest in which eight colleges take part. Gold medals are awarded to the men who represent the College in these events. Each year also the College sends a representative to the State Peace Oratorical Con-

test, where two prizes of \$75.00 and \$50.00 respectively are awarded for first and second place.

Local Debate and Oratory. A local peace oratorical contest is held annually, to the winner of which the Cosmopolitan Club of the College presents a \$10.00 prize. There are also interclass contests in Declamation, Debate, Oratory, and Extempore Speaking, prizes being awarded by the Oratorical Association to the winners of these events. These latter contests are forensic events in the annual Interclass Forensic-Athletic Championship Contest, wherein the four classes compete for individual prizes and three loving cups—the Shakopean Cup, which becomes the permanent property of the highest individual forensic point-winner of the class winning the championship; the Orange O Cup, which becomes the property of the best athlete in that class; and the Barometer Cup, which is held one year by the class winning the interclass championship.

The Sphinx. This is the senior honor society. Membership is acquired by election based on prominence in student activities and scholastic excellence.

The Forum. This society was organized by the junior and senior classes in the spring of 1914, its primary purpose being to recognize efficiency in scholarship among junior and senior students. Election is made to the society by its own membership. The fact that high standards of general excellence have been set by charter members makes it a decided honor to any student to be elected to membership.

The Cosmopolitan Club. This is an organization of foreign and American students. It is a local chapter of the Association of Cosmopolitan Clubs of the World. Its purpose is to provide social and educational advantages for its members and to promote international friendship. At present, nine nations are represented in the local chapter.

The Agricultural Club. This club was established for the purpose of advancing interest in the various phases of agriculture, and promoting the investigation and discussion of both general and special agricultural subjects. Suitable programs are prepared for each meeting, and whenever practicable, leading authorities on practical agriculture are engaged to address the members.

The Lewelling Club. This is the Horticultural Club conducted under the auspices of the Horticultural department. There is no

regular organization, except an executive committee, which has power to transact such business as requires action on the part of the club. It is open to all students interested in horticulture.

Delta Theta Sigma. There is established at the College a local chapter of this national honorary agricultural fraternity. The aim of the society is to advance the study of agricultural subjects by giving honorable recognition to students taking the lead in this work. Elections to membership are made by the members of the local chapter from the junior and senior classes.

The Forest Club. This is an association of students and instructors "formed for the purpose of promoting the forestry interests of the State." In order to carry out its purposes, it meets twice each month. The first meeting of each month is purely of a social nature, with each alternate meeting for the discussion of current forestry, literature, magazine articles, news items, legislation, and general progress movements pertaining to forests, forest service, forest products, forest industries, lumbering, and the lumber trade.

The Civil Engineering Club. This is an organization within the department of Civil Engineering. The active membership is drawn from the junior and senior classes, and the privilege of associate membership is extended to the members of the two lower classes. It meets weekly for the discussion of subjects of interest to the civil engineer.

The Electrical Engineers. This is a College branch of the American Institute of Electrical Engineers. The aim of the organization is to discuss the topics contained in the monthly proceedings of the A. I. E. E., and in this way develop in the student an intimate knowledge of the activities of the national organization, thereby coming into closer touch with the practical problems in the engineering world and becoming better fitted for their life work.

The Miners' Association. This body has for its object the discussion of technical engineering subjects; the review of current mining literature; the presentation of original papers by the active members; and occasional lectures on special mining topics by men outside of the College.

Mechanical Engineers. This is a local College society of students and faculty people interested in Mechanical Engineering. The purpose of the association is to keep in touch with the practical problems of the engineering world.

Sigma Tau. This is a local chapter of the national honorary engineering fraternity, chapters of which exist at nearly all of the recognized technical schools of the United States. Membership in the fraternity is restricted to junior and senior students in Engineering and Forestry, election to membership being based principally upon excellence in scholarship.

The Home Economics Club. This is an organization for the purpose of bringing all the women of the School of Home Economics into closer touch with one another than is possible without a central organization. The aim of the club is to give, by a series of monthly meetings, a general survey of Home Economics questions not covered in regular class room work. The aim is carried out by means of well-directed discussions and by securing outside lecturers who by virtue of their training and experience are considered authorities on subjects relating to Home Economics.

Theta chapter of Alpha Kappa Psi, a national fraternity devoted to the profession of Commerce, was organized during the school year of 1913-14. The purpose of the fraternity is to promote investigation along scientific lines in all phases of commercial work. Membership is open only to students in the junior and senior year in the School of Commerce; and in order to become a member, the student must have shown himself a leader both in scholarship and in student activities.

The Commercial Club. This is a student organization within the School of Commerce. The purpose of the club is to bring its members into close relation with current methods and events in the commercial world. This is accomplished by discussions of topics pertaining to commerce by members of the club, and by addresses at various times during the year by men prominent in the fields of law and business. Active membership is open to all members of the School of Commerce.

The Pharmaceutical Association. The main purpose of this organization, which consists of the pharmacy students, is to bring its members into closer relation with the current events of the pharmaceutical world. This is brought about by discussions in the meetings of topics pertaining to pharmacy, and by addresses at various times during the year by prominent pharmacists and salesmen of the State.

The Easterners' Club. Membership in the Easterners' Club is open to all students and faculty people who have at any time re-

sided in those states situated east of the Mississippi River, or in those provinces of Canada east of Manitoba. The objects of the club are to promote the interests of the College throughout the East, to encourage prospective students from the East and to offer social diversion to its members by providing occasions for the mingling of ideas on such current events as the sports, and politics, which are represented by the various states included within the membership.

The Eastern Oregon Club. This is an organization effected for the purpose of promoting the mutual interests of the College and the people of the eastern part of the State. Its members are afforded many social and intellectual advantages from the regular club meetings. Membership is open to all students from Eastern Oregon.

The California Club is, as the name implies, composed of students whose homes are in California. It is for the purpose of bringing "Californians" together socially that the club meets.

The Portland Club is composed of all of the students registering at the College from Portland, the primary object of the club being social diversion among those students who have been associated in their high school work in previous years.

COLLEGE PUBLICATIONS.

Two classes of publications are issued from the College; one, official, published by the College authorities; the other, unofficial, published by the various student organizations.

The College publications include:

The Catalogue. The General Catalogue is published at the close of the College year, and contains much general and specific information as to the courses of study, equipment, and instruction, and gives a list of faculty members and students for the year.

The Alumni Directory. This publication gives in each edition revised information as to the name, year of graduation, degree, present occupation, and present address of each graduate of the College. The publication is issued every other year.

The Bulletins of the Summer School. These announcements contain specific information of expenses, courses of instruction, character of the work presented, and the requirements that prospective students must meet.

The Bulletins of the Winter School. These announcements carry such information regarding the winter courses as may fully present the advantages of these courses to the public.

Extension Bulletins. These bulletins consist of monographs on the various phases of Agriculture, Domestic Science and Art, Engineering, Mining, and Commerce, together with the bulletins and circulars issued in connection with the Industrial Club work for boys and girls in the public schools. They are written in such style as to be easily understood, thus meeting the popular demand for scientific knowledge and giving it in such form that the people of the State may profit by its application to the problems of everyday life.

The Station Bulletins. These publications comprise two series. The first, or standard series, includes reports upon experimental investigations in agronomy, horticulture, dairying, animal husbandry, poultry husbandry, insect pests, plant diseases, and special subjects of interest to the husbandman. The second, or research series, includes publications dealing with special research problems.

STUDENT PUBLICATIONS.

The student publications comprise:

The Barometer. In March, 1896, the literary societies of the College began the publication of a monthly periodical, the "O. A. C. Barometer." The enterprise has met with deserved success, and "the organ of the student body" is now issued as a four-page, six-column semi-weekly. It publishes the "news of the College," and is of general public importance as representing the interests, character, and accomplishments of the student body at the College. By action of the Board of Regents, resulting from a unanimous recommendation of the Student Body, a portion of the regular semester student fee of \$2.50 will be devoted to the "Barometer," and every student will regularly receive the paper.

The Beaver. This is the annual publication of the junior class, and made its initial appearance as "The Orange," in 1907. It is a high-class publication, substantially bound, and fully illustrated with photoengravings, pen and ink sketches, line and wash drawings. It is a full dress carnival of the year's life, representing the dignity, the beauty, the versatility, the gaiety, the traditions, the sentiment, and the solidarity of the Oregon Agricultural College.

The Oregon Countryman. This is an illustrated monthly magazine, published by the Agricultural and Home Economics students under the supervision of the faculties of these courses. Besides dealing with the work of the various departments in a practical manner, it contains articles of scientific value contributed by the Experiment Station workers. Successful men and women of the State contribute articles for each issue.

The Student Engineer. This is a magazine devoted to engineering and mechanic arts. Its purposes are to record the engineering progress in the Northwest; to furnish news; to discuss methods relating to the mechanic arts; to publish records of scientific work done by the students in this institution; and to publish any matter of special technical and scientific interest. Items of interest will be found for civil, mining, mechanical, and electrical engineers, and for others who are engaged in technical pursuits. The journal is under the supervision of the faculty of the School of Engineering and Mechanic Arts, but the work and responsibilities of the publication are borne by the staff, elected by the students of the School of Engineering.

The C-P Journal. This magazine, published quarterly by the students of the Commerce and Pharmacy departments under the supervision of the faculty of the two schools, is devoted to the commercial and pharmaceutical interests of the school and State. Articles of merit are contributed for each issue by students, faculty, and prominent business men of the State. One distinguishing feature of the C-P Journal is the publication each semester of a complete directory of all the members of the institution, students, faculty, and employees.

STUDENT EXPENSES.

GENERAL FEES.

Tuition is free to all students, regardless of the place of residence. The regular College fees, required of all students, with the exception of special students in music who take no other College work, are as follows:

Entrance fee, payable annually on registration.....	\$5.00
Incidental (Student) fee, payable each semester....	2.50
Diploma fee on graduation.....	5.00
Binding fee for graduation thesis.....	1.00

LABORATORY FEES AND DEPOSITS

Students are charged small fees in the different laboratory courses to cover the cost of material used; and deposits are required to cover cost of breakage in laboratory courses where breakages are likely to occur. These fees are payable at the beginning of each semester. At the end of the semester, deduction is made for actual breakage, and the balance of the deposit is refunded to the student. The fees and deposits charged each semester in the different courses are as follows:

Agronomy:		Fees Deposits	
Courses A, B, 101, 105, 201, 202, 203, 204, 205, 208, 211, 301, 302, 303, 306, 404, 505.....	\$.50	\$	
Courses C, 103, 104, 111, 304, 311, 401, 402, 405....	1.00		1.00
Courses 102, 403, 411.....	1.00		2.00
Animal Husbandry:			
Courses 1, 16.....	.25		
Courses 101, 102, 210, 220, 230, 240.....	.50		
Course 2	1.50		
Art and Architecture:			
Art			
Courses 102, 103, 204, 205, 206, 305, 306, 411, 412, 503, 505, 506 .....	.50		
Courses 600, 601, 602, 603.....	1.00		2.00
Courses 413, 414	1.00		
Architecture			
Courses 503, 504, 505, 506, 507, 508, 509, 512, 513, 515, 519, 533, 535, 536.....	.50		
Courses 501, 502, 510, 511, 516, 517, 601, 602, 701, 702 .....	.75		
Bacteriology:			
Courses 101, 102, 201, 202, 203, 204, 205, 300, 302, 401, 406, 501, 502, 600.....	2.00		1.00
Courses 111, 112, 701.....	2.50		1.00
Botany:			
Courses 82, 83 (per credit).....	.50		
Course 105	1.00		
Courses 30, 31, 41, 42, 45, 66, 70, 71, 101, 102, 104..	1.50		
Courses 20, 35, 62, 64, 111, 115, 116.....	2.00		
Courses 50, 51.....	2.50		2.00

Chemistry:

Fees Deposits

All Laboratory Courses

Fees.....	One dollar per credit hour
Deposits.....	Two dollars per course

Commerce:

Courses B, C, 100, 101, 102, 103, 404, 405, 410, 411, 413, 414.....	1.00
Courses R, S, 400, 401, 402, 403, 404, 405, 410, 411	2.00

Dairy Husbandry:

Courses 1, 6, A. P.....	1.00	2.00
Courses 3, 7, B, D.....	1.00	.25
Courses 4, C.....		.25

Domestic Art:

Courses 101, 102, 201, 202, 203, 204, 501, 601, K, L, N .....	.50
Courses 301, 701.....	1.00
Courses 401, 404.....	4.00

Domestic Science:

Courses E, K, 510.....	.50
Courses M, 190, 202.....	2.00
Course 180	2.50
Courses C, D, 101, 102, 103.....	3.00
Courses 104, 105.....	3.50
Course 201	4.00
Courses H. I.....	6.00

Engineering:**Civil**

Courses 107, 111, 511.....	\$.50
Courses 222, 223, 225, 232, 233, 242, 243, 252, 254, 272, 274, 513, 514, 515, 516, 555, 557.....	1.00

Electrical

Courses 101, 102, 103, 104, 106, 108, 110, 314, 316....	.50	
Courses 201, 202, 203, 204, 403.....	2.50	3.00

Experimental

Courses 210, 238, 255, 262, 265, 272.....	2.00
Courses 201, 202, 203, 204, 205, 206, 207, 208, 231, 232, 233, 235, 240.....	3.00
Courses 291, 292 arranged according to work undertaken.	

		Fees	Deposits
Irrigation			
Courses 204, 301, 402, 701, 802.....		1.00	
Mechanical			
Course 316 .....		.75	
Mining			
Courses 131, 132, 161, 171.....		1.00	
Courses 111, 112.....		3.00	
Course 401		7.50	
Courses 212, 323.....			2.00
Courses 301, 324, 330, 423			5.00
Entomology:			
Courses 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 314, 315.....		1.00	
Forestry:			
Courses 201, 202, 203, 204, 303.....		1.00	
Courses 301, 302, 504.....		1.50	
Courses 501, 502.....		2.00	
Horticulture:			
Course 123 .....		.50	
Courses 101, 103, 104, 105, 201, 401.....		1.00	
Course 125		3.00	
Industrial Arts:			
Courses 106, 133, 202	1.50	2.00	
Courses 152, 153.....	1.50		
Courses C, 105, 110, 111, 112, 113, 116, 131, 132, 134, 137, 203, 206, 207, 208, 209, 212, 213, 250 251	3.00	2.00	
Courses L, 151, 154, 155, 156, 171, 173, 175, 230, 270	3.00		
Courses C1, C2, C3, D1, D2, D3, E1, E2, E3, F1, F2, F3, T1, T2, T3, U1, U2, U3, V1, V2, V3, W1, W2, W3.....	6.00	2.00	
Courses J1, J2, J3, K1, K2, K3, M1, M2, M3, N1, N2, N3, P1, P2, P3, Q1, Q2, Q3.....	6.00		
Courses 103, 104, 135, 136, 205.....	4.50	2.00	
Course 174	4.50		
Industrial Education:			
Courses 140, 161, 504.....	1.50		
Course 162 .....	.50		

Pharmacy:		Fees	Deposits
Courses 130, 140.....		.50	
Courses 118, 151, 170.....		6.00	1.00
Course 121		3.00	
Courses 160, 161.....		3.50	
Physical Education:			
All courses		1.50	
(All students using the Gymnasium pay the fee of \$1.50 per semester, for which they are given use of all equipment, baths, and are furnished with towels, soap, and medical supplies for injuries.)			
Physics:			
All courses		2.00	
Poultry Husbandry:			
Courses 1, 2, A, B.....		1.00	1.00
Course 6			1.00
Veterinary Medicine:			
Courses 3, 4, 11, 14, 15, 18.....		.50	
Courses 2, 5, 6.....		1.00	
Course 1.....		2.00	
Zoology:			
Courses 101, 102, 103, 108, 109, 116, 201, 202, 204, 207, 208		1.50	
Courses 104, 105.....		2.00	3.00
Courses 110, 111.....		1.00	
Courses 112, 113, 205, 209.....			3.00

BOARD AND ROOM.

Women's Dormitories. Waldo Hall and Cauthorn Hall, with their large airy parlors, halls, music and play rooms, are pleasant residences for the young women who come from distant homes. The buildings are supplied throughout with pure mountain water, both hot and cold, electric lights, steam heat, and all modern conveniences. The rooms are furnished with an iron bedstead, a mattress, a chiffonier, a table, and chairs. Such other materials as are needed to make the furnishings complete, including pillows, pillow cases, sheets, blankets, bedspread, are furnished by the student; and many of the students prefer to make the rooms more

homelike by bringing rugs, curtains, pictures, sofa cushions, etc. These latter articles, however, are not at all necessary. The rooms are cheerful and comfortable without additional furniture. The bedrooms average about 12 feet by 15 feet, with one window 3 feet by 7 feet. Many of the rooms are larger, and a few of them have two windows. Each student also furnishes her own towels and table napkins. Students who room together may choose to have a double bed or two single ones. Their preference must be indicated with application for a room. No definite promise for a single room can be made, the privilege of rooming alone depending upon the number of applications for rooms. The many advantages of having a roommate should not be overlooked by the student in making her plans for college life.

The conditions of living in Waldo Hall and Cauthorn Hall are such that the College considers it a distinct advantage to the women students to live in these halls of residence. A wholesome, busy student atmosphere is maintained. Reasonable freedom is allowed, but week nights are reserved for study. All girls entering the College are expected to live either in one of the dormitories or in homes selected by the College Officials, unless their parents reside in the city, or they are given special permission to live with relatives or friends who assume the responsibility of their care.

The expenses of living for each student in the dormitories are as follows:

Room deposit	\$ 3.00
Room rent per semester—	
Single room	20.00
Double room	10.00
Board per week, payable monthly in advance.....	3.50
Incidentals, such as laundry fee, electric iron fee, etc., per semester.....	2.00

The deposit is returned to the student at the close of the semester or school year, in case the room is maintained in a condition satisfactory to the Preceptress.

Young ladies wishing to reserve rooms should send the deposit to the Registrar, Corvallis, Oregon.

Students who are planning to enter the School of Home Economics, or to live in one of the dormitories, are asked to write to the Registrar for special circulars giving more detailed information than will be found in the Catalogue.

The dormitories will be open for students September 17, 1915.

Students who wish to arrive in Corvallis previous to the opening day should make arrangements to board and lodge in town until the morning of that date, when the dormitories will be opened to receive them.

Private Board for Men Students. No dormitory accommodations are available for men students. Board and room may be secured in private families in the city of Corvallis for from \$4.00 to \$5.50 per week. Good accommodations for self-boarding, or for club-boarding, can also be secured in the city. By clubbing, or renting rooms and boarding themselves, students materially reduce the cost of living. Students, however, will not be permitted to live at places not approved by the Faculty.

Lists of private boarding places can be secured from the Secretary of the Y. M. C. A. after the student arrives at the College.

PERSONAL EXPENSES.

The personal expenses of students vary. Many students are able to go through the college year on a comparatively small income. Each male student, immediately upon registration, is required to supply himself with a military uniform, the cost of which will be approximately as follows: Suit and cap, \$11; leggins, 90c; hat band and breast cord, \$1.15; collar ornaments, 25c; gloves, 40c per pair; total, \$13.70. Tan shoes (the regulation style, costing \$3.75) and a drab shirt (costing \$2.00) are appropriate elements of the uniform. The uniform is very serviceable and is more economical than civilian clothing; with reasonable care, it should serve for two or more years.

In physical education women are required to provide themselves with a gymnasium suit, consisting of blouse-waist and bloomers of regulation style, and with regulation gymnasium shoes. Good second-hand uniforms of outgoing girls will be on sale for about \$4.00, while new uniforms cost \$5.00. These suits should be ordered at the gymnasium office at the time of registration.

Male students are expected to supply themselves with a gymnasium suit and the regulation gymnasium shoes. The cost of the gymnasium uniform complete, including shoes, need not exceed \$2.75.

COST OF A YEAR IN COLLEGE.

One of the most perplexing questions that confronts a prospective student is what the course is going to cost him a year. The necessary cost of a year at the College will vary slightly with the particular course pursued by the student. In general, it may be said that the legitimate cost per year averages about \$224. An estimate of the average cost per year for the main expense items is given below. The cost for room and board is estimated at a safe average price. The board and room items are sometimes slightly reduced, where two students occupy the same room or where boarding clubs are economically managed.

Registration fee	\$ 5.00
Incidental (Student) fee	5.00
Laboratory fees and deposits	18.00
Textbooks and supplies	26.00
Board (for eight months)	*120.00
Room rent (nine months)	30.00

In addition to the above, would be the cost to men of the military uniform and the regulation gymnasium suit, and to women of the gymnasium suit and shoes. Uniforms, however, as already indicated, should serve for more than one year. Personal expenses such as clothing, car fare, laundry, etc., vary greatly with the individual.

It is not recommended that any student come to the College without sufficient funds available to purchase his books and college stationery for the entire semester, pay his first month's board and room rent in advance, and pay his first semester entrance fees. For the average student, this initial outlay will be approximately \$70.00, the balance of the annual expenses being distributed about evenly throughout the remaining months of the school year.

SELF-SUPPORT.

A considerable number of students manage, in one way or another, to earn the whole or a part of their expenses while attending the College. Such opportunities occur in the line of office and laboratory assistance, personal services of numerous kinds, the

*On account of Christmas and other vacations which most students spend at home, the cost for board is estimated for eight months only.

management of various student enterprises, agencies for laundries, etc.

The Student Employment Bureau (in charge of the Christsian Associations) registers without charge all students who apply for employment after they arrive at the College, and supplies employers with student labor as demanded. In general, the demand and supply are nearly equal, but the attention of new students who intend to earn the whole or part of their living, is called to the following results of past experience:

1. There is a constant over-supply of those wishing to do teaching and clerical work. None but those having superior qualifications and experience are likely to secure employment the first semester.

2. There is a considerable demand for efficient stenographers; also for men and especially women students who can do domestic labor of any kind; board and room rent may be earned by table service, dish washing, general housework, house cleaning, gardening, etc.

3. Students who can do any kind of domestic or manual labor well, and who have thoroughly good health, can earn their board by three hours' work a day, or board and room by four hours' work a day. But no student should come to the College without resources sufficient for the expenses of one semester. (See "Personal Expenses.")

4. No student should come expecting to earn money, who can do nothing well; skill is essential, as competition is quite as severe in the College community as elsewhere.

5. Opportunities for earning money during the summer vacations can usually be counted on, the demand for forest rangers, for field workers in engineering and mining, for skilled workmen in engineering shops, factories, canneries, and hop-yards, and for horticultural, farm, and forestry laborers, being most constant.

Upon arrival at the College, new students should report for information to the Information Bureau of the Christian Associations.

STUDENT LOAN FUND.

Through the liberality of friends of the Oregon Agricultural College, and through the accumulation of interest on loans, an irreducible student loan fund aggregating \$3995.41, (April, 1915), has

been established. The purpose, as expressed by one of the donors, is "not to induce students to attend school by providing money that can be easily obtained, but rather to aid those who have determined to secure an education and are paying the cost wholly or in part from their own earnings."

The fund consists of the following contributions:

1. One thousand dollars (\$1,000) from Hon. R. A. Booth of Eugene, restricted to students studying:

(a) Agriculture in its various phases, with a view to becoming producers from the soil.

(b) Such branches of mechanics as properly relate to agriculture.

(c) Home Economics.

2. Five hundred dollars (\$500) known as the Ashby Pierce Student Loan Fund.

3. Two thousand four hundred and ninety-five dollars and forty-one cents (\$2495.41), without restriction, from accumulated interest and from various College organizations, such as Folk Club, Philadelphian and Feronian Literary societies, the Barometer, the Oregon Countryman, the Cosmopolitan Club, the Faculty, the Christian Associations, the Winter Short Course students of 1914, Chapter A. of P. E. O., Portland, and by various individuals including Mrs. Clara H. Waldo, Portland, and Hon. Thomas Kay, Salem.*

PRIZE FUND.

The Clara H. Waldo Prize of one hundred dollars is an award annually made in the proportions of forty, thirty, twenty, and ten dollars respectively, to the woman of highest standing registered as a regular student in one of the degree courses in the senior, junior, sophomore, and freshman year. In the distribution of the prizes, the committee is guided by the following points:

(a) Proficiency in literary and scholastic attainments.

(b) Success in student activities.

(c) Qualities of womanhood.

(d) Qualities of leadership.

*Proceeds of a "Faculty Minstrel," given April 23, 1915, increased this fund by nearly \$300.

ADMISSION TO THE COLLEGE.

A student who wishes to be admitted to the Oregon Agricultural College may do so in one of two ways: (1) By examination, (2) by certificate.

Students who seek admission by examination must present themselves for examination at the College on registration days, September 17, 18, 20.

Students who seek admission by certificate may do so in one of the following ways:

For Admission to the Vocational Courses—By presenting properly certified evidence of the completion of the eighth grade course of study in the public schools, and by meeting the other requirements for admission specified in the paragraph on Vocational Courses, under Entrance Requirements.

For Admission to the Degree Courses—By presenting properly certified evidence of the completion of four years of the course of study (15) units) in an accredited or standard high school, and by meeting the other requirements for admission specified in the paragraph on Degree Courses, under Entrance Requirements.

For Admission as a Special Student—By presenting properly certified evidence of suitable preparation for the studies desired, and by meeting the other requirements specified under Special Students.

For Admission as an Optional Student—By presenting properly certified evidence of meeting all the regular entrance requirements, and by meeting the other requirements specified under Optional Students.

For Admission to Advanced Standing—By presenting properly certified evidence of the completion, in other institutions of recognized standing, of such work as is equivalent to corresponding work required in the College courses, and by meeting the other requirements specified under Advanced Standing.

For Admission to Graduate Study—By presenting properly certified evidence of graduation from this or other educational institutions of equal rank, and by meeting the other requirements for admission specified under Graduate Study.

ENTRANCE REQUIREMENTS.

Vocational Courses.

For admission to the vocational courses in Agriculture, Dairying, Forestry, Home Economics, and Commerce, applicants must be at least 18 years of age, and in addition to having completed the eighth grade course of study, must be of good moral character. For admission to the vocational course in Mechanic Arts, applicants must be at least 16 years of age, and in addition to having completed the eighth grade course of study, must be of good moral character. Applicants who have not completed the eighth grade course of study, but who are 21 years of age or over, and of good moral character, may be admitted to any of the vocational courses at the discretion of the dean of the school in which the work is to be carried on. For a statement of the length and character of the vocational courses, see Courses of Study.

Degree Courses.

Applicants for admission to the degree courses must be 16 years of age or over and of good moral character. The fifteen units required for entrance distributed in the most advantageous way for admission to the various College courses in Agriculture, Home Economics, Forestry, Engineering, Commerce, and Pharmacy, are indicated in the table entitled "Prescribed Units for Admission." If the distribution of units presented by the matriculate does not correspond to that recommended, as indicated by the table, the student will be required to carry in College the courses lacking in his secondary credits, in order to make up his deficiency.

Prescribed Units for	Agriculture	Home Economics	For. & Log. Engineering	Engineering	Commerce	Pharmacy
English	3	3	3	3	3	3
Mathematics—						
Algebra	1½	1½	1½	1½	1½	1½
Plane Geometry	1	1	1	1	1	1
Solid Geometry	0	0	0	½	0	0
Physics	0	0	0	1	0	0
Bookkeeping	0	0	0	0	1	0
Electives	9½	9½	9½	8	8½	9½
Total units	15	15	15	15	15	15

A unit, as referred to in the table, implies one high school subject carried for five 45-minute periods a week throughout the school year.

The electives listed in the table may be selected from any of the subjects, except Music, offered in the "Oregon Course of Study" for high schools.

While History and Foreign Languages are not prescribed by the College as entrance requirements, students are urged to pursue these subjects in the high school. For credit involved in this work, see Advanced Standing.

To be admitted as a conditioned freshman, a student must not lack more than two of the total number of entrance units. All entrance conditions must be removed during the freshman year.

ENTRANCE REQUIREMENTS FOR ADMISSION TO THE FRESHMAN YEAR.

In English. Admission to the English courses of the freshman year is by certification from accredited secondary schools. When an applicant cannot furnish such certification, his admission to the freshman courses is conditioned on his passing an examination in essentially the following tests:

1. To test his power of written expression, he will write one or more compositions on a subject, or on subjects, suggested by his personal, school, community, or literary interests.

2. To test his power of oral expression, he will read at sight, in the presence of the Examiner, passages of prose, or of poetry, or both, with accuracy and effectiveness. He will also be expected to talk intelligently in good English, on some assigned subject adapted to his ability.

3. To test the range and character of his reading, and his power of appreciation, he will be expected to answer a number of simple questions on standard classics and contemporary literature not previously prescribed. He will also be expected to explain the meaning of several passages of prose and of poetry of moderate difficulty, selected from books not previously prescribed.

Whether the applicant be admitted by certification or by examination, the English department will, whenever it deems such a course advisable, deal with the student as in a probationary relation.

In case the work of such student should, at the expiration of thirty days after matriculation, fail to conform to the standard set for creditable freshman work, he may be required to make up his deficiencies in English.

Candidates presenting exercise books containing compositions or other written work properly certified to by the instructor, will be given credit for such work.

In Mathematics. The entrance requirements in Mathematics; namely, one and one-half units in Algebra and one unit in Plane Geometry, will be satisfied by the applicant's ability to pass a satisfactory examination in the following topics: addition, subtraction, multiplication, and division of positive and negative numbers; use of parentheses, factoring, highest common factor, lowest common multiple, fractions, fractional and literal equations, simultaneous equations, problems involving linear equations with one or more unknown numbers, graphical representation of simultaneous linear and quadratic equations, involution, evolution, theory of exponents, radical expressions, imaginary numbers, quadratic equations, problems involving quadratic equations with one unknown number, equations in the quadratic form, factoring of quadratic equations, solution of quadratic equations by factoring, simultaneous quadratic equations, problems involving simultaneous quadratic equations with two unknown numbers.

The requirements in Plane Geometry are the five books of Wentworth's Plane Geometry, or any other standard text on the subject. That the student may be trained to think for himself and not be dependent upon the published proofs of the text, much importance is based upon the proving of original exercises. It is distinctly advised that students preparing for entrance examination in Geometry devote considerable time to the study of original exercises.

In Physics. The "one unit" entrance requirement in Physics for the year 1915-16 will be satisfied by one school year's work in physics, using the State text, Millikan and Gale, or any other of the standard high school texts. The class should meet five times a week, each period being at least 45 minutes in length. At least one period each week should be devoted to laboratory work. In order to concentrate the attention upon the fundamental principles, rather than upon manipulation and computation, it is well frequently to make the experiments qualitative rather than quanti-

tative in nature. A neat report should be required upon every experiment; each report should include: (1) a concise statement of the object of the experiment; (2) a brief description of the apparatus and the method; and (3) data and results, tabulated whenever possible. These reports should be criticised by the teacher, and the student should be compelled to correct not only mistakes in physics, but also mistakes in grammar, rhetoric, and spelling, as it is certainly true that a correct form of expression is just as important to the student as correct ideas. Clear expression and clear ideas go hand in hand.

In Bookkeeping. The entrance requirements in bookkeeping for the year 1915-16 are the elements of double entry. The applicant must be familiar with the principles of debit and credit, the usual forms of entries, the standard books of entry, and of trial balances, balance sheets, and statements. He must be able to write a good, plain business hand, and be able to handle figures readily and accurately. Candidates who are deficient in these requirements must register conditioned in the subject, and remove the condition during the freshman year.

ACCREDITED SCHOOLS.

Pending the preparation of a classified list of high schools by the Oregon State Department of Public Instruction, students who have completed four years of high school work will be admitted to the degree courses on presentation of a signed statement of the principal showing work completed. It is recommended that the Certificate of Record blank issued by the Oregon Agricultural College, be used. Copies will be sent by the Registrar on the application of either student or principal. These blanks must be filled out and signed by the principal or other authorized official of the school. The certificate, so authenticated, should be filed with the Registrar of the College on or before September 12, 1915. Acknowledgement of the receipt of such certificate will be made by the Registrar up to and including September 12.

SPECIAL STUDENTS.

Students who have presented satisfactory evidence of suitable preparation for the studies they desire, who are 18 years of age, and of good moral character, may be admitted as special students,

provided they have neither already been admitted to the College, nor, having applied for admission, been rejected.

Special students may be allowed to graduate in any of the courses, on condition that they complete the required work and pass the necessary examinations.

Special students are expected to select their studies from courses open to freshmen. If they desire to take studies to which only advanced students are regularly admitted, they must show some special preparation or special necessity for such courses.

Candidates applying for admission on the above basis should file with the Registrar before September 12, 1915, a detailed statement of their preparatory work.

OPTIONAL STUDENTS.

Students who have presented satisfactory evidence of meeting all the entrance requirements for the freshman class, who are of mature years and of good moral character, may be admitted as optional students, provided they furnish satisfactory evidence that they are unable, because of poor health, or outside business, or professional duties, to take a full course. They should file with the Registrar, before September 12, 1915, a certified statement of all preparatory work.

ADVANCED STANDING.

Students matriculating in the degree courses with more than the number of credits required for entrance to the freshman class, will be given advanced standing for such credits as represent work beyond the full four years high-school course and are equivalent to the requirements of the course in which the student matriculates.

No credit will be allowed either for any Science carried for less than one full year, or for any Foreign Language carried for less than two full years.

ADMISSION FROM OTHER COLLEGES.

Any student who has attended another college or university and desires to enter the Oregon Agricultural College, should file with the Registrar, on or before September 12, 1915, an official certificate from the college from which he wishes to transfer,

giving evidence of: (1) his honorable dismissal; (2) a detailed statement of the entrance credits presented at the time of his matriculation at the other college; (3) a detailed statement of the work pursued while in attendance at that college; and (4) a marked copy of the catalogue of the institution, showing by conspicuous markings the courses which he completed.

REGISTRATION.

All candidates for admission should file with the Registrar a certificate of their preparatory record on or before September 12, 1915. Blank forms for such record may be secured from the Registrar. Such candidates should present themselves for registration at the College on September 17, 18, or 20, 1914. Registration at a later date will be permitted only on presentation of a satisfactory reason for the delay. Students in all courses register at the beginning of the collegiate year for the work of the entire year. Credit for work not so registered, and changes in registration, will be allowed only by special permission of the College Council.

Students who have not before registered at the College are advised to reach Corvallis not later than September 16, 1915, in order that they may secure a boarding and rooming place before the first day of registration.

GRADUATION.

The degree of Bachelor of Science in Agriculture, in Forestry, in Logging Engineering, in Home Economics, in Civil Engineering, in Electrical Engineering, in Irrigation Engineering, in Highway Engineering, in Mechanical Engineering, in Mining Engineering, in Ceramics, in Chemical Engineering, in Commerce, in Pharmacy, and in Industrial Arts, is conferred upon those who have satisfactorily completed the respective four-years courses which in the aggregate comprise 136 credits of College work. A graduate in any of the courses may receive the bachelor's degree in any other course by completing the studies required in that course.

The degree of Graduate in Pharmacy is granted to those students in Pharmacy who complete specified work meeting the requirements of the American Conference of Pharmaceutical Faculties.

A certificate will be granted those students who complete the Vocational Course in Agriculture, Dairying, Home Economics, Mechanic Arts, or Commerce.

GRADUATE STUDY.

The Oregon Agricultural College offers to its graduates and to those of other institutions of equal rank, work in Agriculture, Home Economics, and Pharmacy leading to the degree of Master of Science, and work in Engineering, Mining, and Forestry, leading to the usual professional degrees.

This work is done in the several departments of the College under the general supervision of a standing committee of the Faculty known as the committee on "Graduate Students and Advanced Degrees."

REQUIREMENTS FOR THE HIGHER DEGREES.

Candidates for any one of the higher degrees will be required to complete a certain minimum of resident work, to prepare a suitable thesis, and to pass an oral examination.

The resident work is planned so that it may be completed in a single year by a student who devotes full time to his studies; it consists of a minimum of 32 credits, including the preparation of the thesis. One credit requires approximately three hours of the student's time each week for one semester. From 16 to 24 of these credits will be devoted to the thesis and to allied subjects in the same department, and will constitute the candidate's major. From 8 to 16 of these 32 credits will be selected from other departments of the College and will constitute the minor. Undergraduate work may, at the discretion of the committee, be taken as part of the minor, but, when so taken, the number of credits allowed for any course will be reduced to two-thirds of the number listed in the catalogue, the assumption being that the candidate can, in work of that grade, accomplish as much in two hours as the average undergraduate in three. All graduate students taking regularly announced courses must attend the examinations given as part of such courses.

The thesis must embody the results of investigative, though not necessarily original research, and a typewritten copy of the thesis, prepared according to the specifications of the committee, must be deposited with the chairman of the committee not later

than two weeks prior to the date set for commencement of the year in which the degree is desired.

After the thesis has been deposited, the chairman will appoint a special examining committee and set a date for the oral examination. This special committee will consist of: (1) the one or more professors in charge of the major; (2) the one or more professors in charge of the minor; and (3) one or more members of the Committee on Graduate Students and Advanced Degrees. The report of this committee will be presented to the College Council by the chairman of the Committee on Graduate Students and Advanced Degrees. The chairman will deposit the theses of successful students with the Librarian as soon as possible after the oral examination.

Higher degrees will be conferred only at the regular commencement exercises, but the committee may under exceptional circumstances allow the candidate to be absent from such exercises.

ADMISSION TO THE COLLEGE AS A GRADUATE STUDENT.

All students who have been graduated from four-year courses in the Oregon Agricultural College or in other colleges of equal rank, will be considered graduate students and will be registered as such by the Registrar. Graduate students will be required to present credentials to the Registrar as specified under "Admission from Other Colleges."

FEES.

Graduate students will pay the same entrance, incidental, diploma, and binding fees as undergraduates. Laboratory fees will in each case be determined by the head of the department concerned, and must be paid at the beginning of the year in which the laboratory work is done.

COURSES OF STUDY.

The Oregon Agricultural College offers the following courses of study, each of which extends over four years and leads to the degree of Bachelor of Science:

In the **School of Agriculture**, major courses in—

- | | |
|--------------------------|--------------------------------|
| (a) General Agriculture. | (g) Agricultural Chemistry. |
| (b) Agronomy. | (h) Agricultural Bacteriology. |
| (c) Animal Husbandry. | (i) Botany and Plant Pathology |
| (d) Dairy Husbandry. | (j) Economic Zoology. |
| (e) Horticulture. | (k) Economic Entomology. |
| (f) Poultry Husbandry. | (l) Agriculture for Teachers. |

In the **School of Forestry**, major courses in—

- | | |
|-----------------------|--------------------------|
| (a) General Forestry. | (b) Logging Engineering. |
|-----------------------|--------------------------|

In the **School of Home Economics**, major courses in—

- | | |
|----------------------|-------------------------------|
| (a) Domestic Science | (c) Home Administration. |
| (b) Domestic Art. | (d) Institutional Management. |

In the **School of Engineering**, major courses in—

- | | |
|-----------------------------|-----------------------------|
| (a) Civil Engineering.* | (d) Highway Engineering. |
| (b) Electrical Engineering. | (e) Irrigation Engineering. |
| (c) Mechanical Engineering. | (f) Industrial Arts. |

In the **School of Mines**, major courses in—

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|-------------------------|---------------------------|
| (a) Mining Engineering. | (c) Chemical Engineering. |
| (b) Ceramics. | |

In the **School of Commerce**, a major course in—

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|---------------|
| (a) Commerce. |
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In the department of **Pharmacy**, a course in—

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|---------------|
| (a) Pharmacy. |
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In addition to the above baccalaureate courses, provision has been made for the following:

1. A two-years course in Pharmacy leading to the degree of Ph. G., and

2. Vocational courses, varying in length from 6 months to three years, as follows:

- A. Agriculture (one year).
- B. Dairying (one year).
- C. Home Makers' Course (one year).
- D. Mechanic Arts (three years).
- E. Forestry (November 8 to April 14).
- F. Business Short Course (two years).

*No work below Junior grade will be given in Civil Engineering during the year 1915-16.

SCHOOL OF AGRICULTURE.

The School of Agriculture offers the following courses of study: a one-year course in General Agriculture; a one-year course in Dairying; a three-months winter course in Dairying; a four-weeks winter course in Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, and Poultry Husbandry (known as the Winter Short Course); and twelve four-year courses, each of which leads to the degree of Bachelor of Science.

Vocational Courses. The one-year courses are provided especially for those who have had no opportunity to pursue their public school courses beyond the eighth grade, or who, from necessity or choice, desire upon completing the work of this grade, to obtain as quickly as possible a working knowledge of the principles of agricultural practice. They are also open to students with one or more years of high school preparation, and to men of mature years and practical experience, who may desire to familiarize themselves with the most modern thought on this subject. Those who pursue the one-year course in Agriculture will have the opportunity of specializing in general farm practice, live stock husbandry, horticulture, or poultry husbandry; and those who pursue the one-year course in Dairying will have the opportunity of specializing in Dairy Production or Dairy Manufacturing.

In this State there are thousands of young men who are to become our future farmers and orchardists. It is to the interest both of the individual and of the State that these young men should keep pace with the rapid development of agriculture. Each and every one should have, if possible, the opportunity of obtaining an agricultural education. Many of these young men are so situated, however, that it is impossible for them to attend any of our regular four-year courses. There are also many mature men well past the usual school age, no doubt, who desire to acquaint themselves more fully with the more recent developments in agricultural science and practice. It is to meet the needs of such men, both young and old, that these one-year courses are offered. They are designed to provide the largest amount of practical information and training that can be given in one year.

The Degree Courses. The various degree courses in Agriculture are open only to those who have completed the equivalent of four years of the Oregon State high school course (see Admission

to the College). The aim of these courses is to train young men to become successful farmers, stockmen, and fruit growers; to equip them to become efficient managers of orchard and ranch properties and of agricultural cooperative organizations; to prepare them to become specialists in some branch of agricultural college or experiment station work, or to fit them to become teachers of agriculture in the public schools. In short, they offer to those who have faith in the farm and in rural life, opportunities for individual development and technical training equal to those provided for the educated in other professions.

The various subjects of instruction may be conveniently arranged into three groups, as follows:

(a) **Sciences related to Agriculture**; i. e., Botany, Zoology, and Entomology; Chemistry, Physics, and Bacteriology; (b) **Technical Agricultural subjects**; i. e., Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, Poultry Husbandry, and Veterinary Medicine; (c) **Non-technical subjects**; i. e., English Language and Literature, Modern Languages, Political Science, Rural Economy, Rural Sociology, and similar subjects.

The subjects of the first group are designed to furnish the student with an insight into the principles of agricultural science. Those of the second group teach him the application of these principles and give him also, both theoretically and practically, various subjects of agricultural technology. The subjects of the third group tend further to develop the student's intellect, broaden his view, and train him in good citizenship.

To indicate briefly the nature of the work, it may be stated that in the courses of Agronomy, the student studies the origin, structure, fertility, cultivation, and improvement of various soils; the history, growth, culture, improvement, and value of the different field crops; the structures, machinery, drainage, and irrigation of the farm; and the history, economics, methods, and business principles in farm management. Thorough courses in Business Administration, Rural Economy and Sociology, and Political Science for Agricultural students are given by the School of Commerce. In the course in Animal Husbandry, consideration is given to the history and characteristics of the various breeds of live stock; the principles of breeding; the principles and practice of feeding, with particular reference to conditions in this State. By constant practice in stock judging, the student is made familiar

with the good points of the various breeds. In Horticulture the student studies the problems of the orchard and garden, such as choice of sites, soils, planting, pruning, choice of varieties, sprays and spraying, and thinning; he obtains instruction and practice in the propagation of plants by various methods; in the harvesting, packing, storage, and marketing of fruits; he may study the principles of plant breeding, or the construction and management of greenhouses, or the culture of small fruits and vegetables for market or canning purposes. In Dairy Husbandry he studies the secretion, composition, and separation of milk and cream; and obtains abundant practice in the use of the Babcock and other tests, in butter and cheese making, and in creamery practice. A department of Poultry Husbandry offers to students exceptional opportunities to specialize in this line. The instruction will include a study of breeds, the principles of feeding, housing, and incubation, and will be supplemented by practical work on the farm. In Veterinary Medicine the student is taught to prevent disease, diagnose existing pathological conditions, arrest outbreaks of contagious and infectious diseases among domestic animals, give medical attention in emergency cases, and take care of the sick.

In response to the demand for special teachers of Agriculture in the high schools, an opportunity is given students to major in agricultural education. Certain courses are prescribed in the junior and senior years to broaden the general agricultural training of the first two years, so that the teacher may be prepared to meet the conditions in any section of the State. Courses in Pedagogy provide the necessary principles and methods of teaching. Some election is also allowed in order that the student may specialize along the lines of his greatest interest.

The degree courses in Agriculture can be conveniently arranged into a farm practice group, including the various courses in the departments of Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, and Poultry Husbandry, and Agriculture for Teachers; and an Agricultural science group, including the courses in the departments of Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology. As indicated in the following outlines, all candidates for the degree of Bachelor of Science in Agriculture will be required to pursue the prescribed studies of one of these groups during the first two years of the course, in order that each

may become well grounded in the fundamentals of Agricultural science and practice. During the remaining two years of his course, each student will be given an opportunity to become proficient in some one branch of Agricultural practice, or of Agricultural science, by taking major work in one of the above mentioned subjects; or, if preferred, the student may elect to pursue a course in General Agriculture.

All students working for a degree will be required to carry at least seventeen credits through the junior year, and sixteen credits through the senior year. Subjects other than those prescribed must be selected with the advice of the head of the department in which the major is taken, except in the case of students who elect to pursue the course in General Agriculture. Minors may be selected from any of the above mentioned departments, or from the departments of English, Mathematics, Physics, Commerce, Industrial Pedagogy, Civil Engineering, Highway Engineering, Architecture, Modern Language, or Forestry.

PRACTICAL EXPERIENCE REQUIREMENT FOR GRADUATION.

Those students majoring in applied agriculture will be required to have had a certain amount of practical experience, either before entering the institution or during vacation periods, before being granted a degree. The amount of practice work necessary will be determined in each case by the head of the department in which the student is majoring.

One-Year Course in Agriculture.

	Semester	
	1st	2nd
*Elementary Constructive English (Eng. A).....	3	
*Composition (Eng. B)		3
Farm Accounting (Com. E).....		3
Business and Social Organization (Com. I).....	3	
Woodwork (Shop G)	2	
Blacksmithing (Shop L)		2
Soils (Agron. A)	3	
Farm Crops (Agron. B)		3
Agronomy (Optional)—		
Farm Machines and Engines (Agron. C).....	3	
Farm Drainage (Agron. D)		2
Dry Farm Practice (Agron. E)	2	
Irrigation Farming Practice (Agron. F).....		2
Animal Husbandry (Optional)—		
Stock Judging (A. H. A.)	2	
Feeding and Management (A. H. B.)		5
Elements of Stock Feeding (A. H. E.)	2	
Diseases of Domestic Animals (V. M. 15).....	3	
Horticulture (Optional)—		
Horticultural Practice (Hort. A, B).....	5	5
Poultry Husbandry (Optional)—		
Practical Poultry Keeping (P. H. A. B.)	5	5
**Drill (Military A, B)	1	1
**Gymnasium (Phys. Ed. 11, 12)	1½	1½

*Students who have a satisfactory knowledge of English may elect an equivalent amount of other work.

**Mature men may be excused from Military Drill and Gymnasium work.

One-Year Course in Dairying.

	Semester	
	1st	2nd
Elementary Constructive English (Eng. A)	3	
Composition (Eng. B)		3
Dairy Accounting (Com. D)		3
Dairy Mechanics (Ind. Arts 230)		2
Testing Dairy Products (D. H. A.)	2	
Dairy Bacteriology (Bact. 406)		2
Drill (Military A. B.)	1	1
Gymnasium (Phys. Ed. 11, 12)	½	½
Dairy Manufacturing (Optional)—		
Butter Making and Factory Management (D. H. B.)	4	
Cheese Making (D. H. C.)		4
Ice Cream (D. H. D.)	2	
Judging Butter and Cheese (D. H. H. I.).....	1	1
Creamery Practice (D. H. E. F.)	2	2
Special Creamery Tests (D. H. P.)		2
Breeding, Feeding and Management Dairy Cattle (D. H. J. K.*)	2	2*
Judging Dairy Cattle (D. H. L. M.*).....	1	1*
Dairy Production (Optional)—		
Diseases of Dairy Cattle (Vet. Med. 17, 18).....	2	2
Farm Crops (Agronomy B)		3
Judging Dairy Cattle (D. H. L. M.)	1	1
Breeding, Feeding and Management Dairy Cattle (D. H. J. K.)	2	2
Dairy Practice (D. H. N. O.)	1	1
Farm Soils (Agronomy A)	3	
Blacksmithing (Ind. Arts L), and Woodwork (Ind. Arts G), and Live Stock Management (A. H. 2) Elective.		

*Second semester of Breeding, Feeding, and Management of Dairy Cattle and Judging Dairy Cattle are optional.

DEGREE COURSES IN AGRICULTURE.

	Semester	
	1st	2nd
Freshman Year.		
Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 100, 101).....	3	3
General Physics (Phys. 1, 2)	3	3
Agricultural Botany (Bot. 41, 42).....	3	3
Soils (Agron. 101)	3	
Crop Production (Agron. 201)		3
Stock Judging (A. H. 1)	2	
Woodwork (Ind. Arts 106)		1
Library Practice (Libr. 1)		½
Hygiene (Phys. Ed. 10)		½
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	½	½
	<hr/> 18½	<hr/> 18½
Sophomore Year.		
Farm Accts. & Business Methods (Com. 109).....	2	
Principles of Economic Zoology (Zool. 108, 109).....	3	3
Agricultural Chemistry (Chem. 500, 501).....	3	3
Elementary Bacteriology (Bact. 101)	3	
Principles of Fruit Growing (Hort. 101).....	3	
Vegetable Growing (Hort. 201).....		2
Elements of Dairying (D. H. 1)		3
Live Stock Management (A. H. 2).....		3
*Farm Surveying and Leveling (C. E. 242).....	2	
Practical Poultry Keeping (P. H. 6).....		2
Blacksmithing (Ind. Arts 153).....	1	
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	½	½
	<hr/> 18½	<hr/> 17½

*Students desiring to specialize in the course in Farm Business and Rural Leadership will take Com. 219 instead of C. E. 242.

Junior Year.

	Semester	
	1st	2nd
Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Major and Minor Electives	12	15
	—	—
	17	17

Senior Year.

National Government (Com. 320)	3	
State and Municipal Government (Com. 322).....		3
Major and Minor Electives	13	13
	—	—
	16	16

RECOMMENDED COURSES.

Junior and Senior Outlines. The following outlines are intended to indicate the courses which it is recommended that students pursue who wish to major in any particular subject, such as Field Crops, Dairy Manufacturing, Pomology, Poultry Husbandry, etc. While it is expected that students will adhere rather closely to these outlines, the courses may be altered to suit the needs of individual students on consultation with the head of the department in which the major is taken.

COURSES IN AGRONOMY.

(a) General Agronomy.

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219)	3	
Cereal Crops (Agron. 202)	4	
Field Machinery (Agron. 401)	2	
Land Drainage (Agron. 301)		3
Soil Physics (Agron. 102)		4
Farm Power Machinery (Agron. 402)		3
Junior Seminar (Agron. 503)		1
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	6	4
	—	—
	17	17
Senior Year.		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Agrostology (Agron. 205)	3	
Forage Crops (Agron. 203)	2	
Soil Fertility (Agron. 104)	4	
Crop Improvement (Agron. 204)		3
Farm Management (Agron. 505)		3
Senior Seminar (Agron. 504)		1
Approved Electives	4	4
	—	—
	16	16

(b) Soils.

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219)	3	
Forage Crops (Agron. 203)	2	
Cereal Crop Lectures (Agron. 202)	2	
Agricultural Bacteriology (Bact. 501, 502)	3	3
Land Drainage (Agron. 301)		3
Soil Chemistry (Chem. 503)	3	
Soil Physics (Agron. 102)		4
Junior Seminar (Agron. 503)		1
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	2	4
	—	—
	17	17
Senior Year.		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Agricultural Geology (Min. 171)	3	
Soil Fertility (Agron. 104)	4	
Crop Improvement (Agron. 204)		3
Farm Management (Agron. 505)		3
Soil Surveying (Agron. 106)		2
Senior Seminar (Agron. 504)		1
Approved Electives	6	4
	—	—
	16	16

(c) Field Crops.

Junior Year.	Semester	
	1st	2nd
Agricultural Economics (Com. 219)	3	
Agricultural Bacteriology (Bact. 501)	3	
Introductory Entomology (Ento. 301)	2	
Cereal Crops (Agron. 202)	4	
Land Drainage (Agron. 301)		3
Crop Improvement (Agron. 204)		3
Soil Physics (Agron. 102)		4
Junior Seminar (Agron. 503)		1
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	3	4
	—	—
	17	17

Senior Year.

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Agrostology (Agron. 205)	3	
Forage Crops (Agron. 203)	2	
Soil Fertility (Agron. 104)	4	
Farm Management (Agron. 505)		3
Advanced Crop Work (Agron. 211)		2
Senior Seminar (Agron. 504)		1
Feeds and Feeding (A. H. 23)		3
Approved Electives	4	4
	—	—
	16	16

(d) Irrigation Farming.*

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219).....	3	
Irrigation Farming (Agron. 302)	3	
Climatology (Agron. 303)		1
Topographic Surveying (C. E. 243)	2	
Elementary Bacteriology (Bact. 101)	3	
Land Drainage (Agron. 301)		3
Elements of Dairying (D. H. 1)		3
Crop Improvement (Agron. 204)		3
Junior Seminar (Agron. 503)		1
Farm Power Machinery (Agron. 402)		3
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6)	1	1
Approved Electives	4	1
	—	—
	17	17
Senior Year.		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322).....		3
Hydraulics (I. E. 101)	2	
Hydraulic Lab. (Exp. E. 265)	1	
Irrigation Institutions (Agron. 305)	2	
Soil Fertility (Agron. 104)	4	
Advanced Drainage and Irrigation Work (Agron. 311)....	2	
Farm Management (Agron. 505)		3
Senior Seminar (Agron. 504)		1
Feeds and Feeding (A. H. 23)		3
Dairy Herd Management (D. H. 40)		3
Approved Electives	2	3
	—	—
	16	16

*In the sophomore year students electing Irrigation Farming are required to take Trigonometry (Math. 11, 3 credits, 1st semester), and Soil Physics (Agron. 102, 4 credits, 2nd semester), instead of Elementary Bacteriology (3 credits, 1st semester), and Elements of Dairying (3 credits, 2nd semester).

(e) Farm Management

	Semester	
	1st.	2nd
Junior Year.		
Forage Crops (Agron. 203)	2	
Cereal Crops (Agron. 202 (Lectures only)).....	2	
Diseases of Live Stock (Vet. Med. 14)		3
Typewriting (Com. 410a)	1	
Weed Eradication (Agron. 501)	1	
Practical Pomology (Hort. 102)	2	
Soil Physics (Agron. 102)		4
Farm Power Machinery (Agron. 402)		3
Farm Management (Agron. 505)		3
Junior Seminar (Agron. 503)		1
Land Drainage or Irrigation Farming (Agron. 311 or 302)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	4	1
Summer field work required (See Agron. 511).	—	—
	17	17

Senior Year.

Soil Fertility Lecture (Agron. 104)	3	
Semi-Arid Crop Production (Agron. 207)		1
Introductory Entomology (Ento. 301)	2	
Principles of Plant Pathology (Bot. 101)	2	
Cooperative Accounting and Management (Com. 130)....	3	
Economic Organization of Agriculture (Com. 264).....	3	
Composition of Addresses (Eng. 103)	2	
Advanced Farm Management (Agron. 511)		3
Senior Seminar (Agron. 504)		1
Feeds and Feeding (A. H. 23)		3
Dairy Herd Management (D. H. 40)		3
Rural Finance (Com. 265)		3
Soil Surveying (Agron. 106)		2
Approved Electives	1	
	—	—
	16	16

COURSE IN ANIMAL HUSBANDRY.

	Semester	
	1st	2nd
Junior Year.		
Advanced Commercial Law (Com. 300, 301)	3	3
Agricultural Economics (Com. 219).....	3	
Comparative Anatomy (Vet. Med. 1)	3	
Comparative Physiology (Vet. Med. 2)		3
Types and Breeds of Horses (A. H. 210)	2	
Types and Breeds of Cattle (A. H. 220)	2	
Types and Breeds of Sheep (A. H. 230)		2
Types and Breeds of Hogs (A. H. 240)		2
Soil Physics (Agron. 103)		3
Forage Crops (Agron. 203)	2	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Elective		2
	—	—
	17	17
Senior Year.		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322)		3
Diseases of Live Stock (Vet. Med. 3, 4).....	3	3
Animal Chemistry (Chem. 509)	2	
Animal Nutrition (A. H. 7)	2	
Principles of Breeding (A. H. 6)		3
Feeds and Feeding (A. H. 21)		5
Advanced Stock Judging (A. H. 16)	3	
Livestock Practice (A. H. 100, 102)	2	1
Seminar (A. H. 18, 19)	1	1
	—	—
	16	16

COURSES IN DAIRY HUSBANDRY.

(a) Dairy Production.

Junior Year.	Semester	
	1st	2nd
Agricultural Economics (Com. 219)	3	
Forage Crops (Agron. 203)	2	
Animal Nutrition (A. H. 7)	2	
Genetics (Zool. 120)	3	
Comparative Anatomy (Vet. Med. 1)	3	
Dairy Bacteriology (Bact. 401)	3	
Comparative Physiology (Vet. Med. 2)		3
Herd Management and Milk Production (D. H. 2).....		5
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Electives		6
Junior Seminar (D. H. 21)		1
	17	17

Senior Year.

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Animal Chemistry (Chem. 509)	2	
Breeds and Breeding of Dairy Cattle (D. H. 5).....	3	
Diseases of Live Stock (Vet. Med. 3, 4)	3	3
Dairy Inspection and Dairy Farm Equipment (D. H. 6)..	3	
Dairy Mechanics (Ind. Arts 230)		2
Buttermaking and Factory Management (D. H. 3).....		5
Senior Seminar (D. H. 8)		1
Advanced Judging (D. H. 10) (Elective)	1	
Approved Electives	1	1
Dairy Research (D. H. 12) (Elective)		
	16	16

(b) Dairy Manufacturing.

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219)	3	
Forage Crops (Agron. 203)	2	
Animal Nutrition (A. H. 7)	2	
Business Organization and Management (Com. 110).....	3	
Genetics (Zool. 120)	3	
Dairy Chemistry (Chem. 502)		3
Buttermaking and Factory Management (D. H. 3).....		5
Milk Production and Herd Management (D. H. 2).....		5
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	2	1
Junior Seminar (D. H. 21)		1
	—	—
	17	17
Senior Year.		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322).....		3
Cheesemaking (D. H. 4)	4	
Dairy Bacteriology (Bact. 401)	3	
Breeds and Breeding of Dairy Cattle (D. H. 5).....	3	
Dairy Inspection and Dairy Farm Equipment (D. H. 6)..	3	
Ice Cream and Ices (D. H. 7).....		2
Dairy Mechanics (Ind. Arts 230)		2
Seminar (D. H. 8)		1
Butter and Cheese Judging (D. H. 9).....		1
Electives		7
Dairy Research (Elective) D. H. (12).		
	—	—
	16	16

COURSES IN HORTICULTURE.

(a) Pomology.

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219)	3	
Floriculture (Hort. 401)	2	
Landscape Gardening (Hort. 301)		2
Plant Propagation (Hort. 105)		2
Practical Pomology (Hort. 102)	2	
Orchard Practice (Hort. 103, 104)	2	2
Plant Physiology (Bot. 50)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	6	6
	<hr/>	<hr/>
	17	17

Senior Year.

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Systematic Pomology (Hort. 115)	4	
Commercial Pomology (Hort. 117)		2
Introductory Entomology (Ento. 301)	2	
Entomology of Orchard and Small Fruits (Ento. 302)....		2
History and Literature of Horticulture (Hort. 125).....		2
Seminar (Hort. 123, 124)	1	1
Principles of Plant Pathology (Bot. 101)	2	
Diseases of Orchards and Small Fruits (Bot. 102).....		2
Approved Electives	5	5
	<hr/>	<hr/>
	17	17

(b) Olericulture.

	Semester	
Junior Year.	1st	2nd

Agricultural Economics (Com. 219)	3	
Plant Propagation (Hort. 105)		2
Practical Vegetable Gardening (Hort. 203, 204).....	3	3
Floriculture (Hort. 401)	2	
Landscape Gardening (Hort. 301)		2
Introductory Entomology (Ento. 301)	2	
Entomology of Truck and Field Crops (Ento. 303).....		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	5	5
	—	—
	17	17

Senior Year.

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Commercial Truck Gardening (Hort. 209, 210)	3	3
Forcing Vegetables (Hort. 205, 206)	2	2
Systematic Olericulture (Hort. 207)	1	
Seminar (Hort. 123, 124)	1	1
Principles of Plant Pathology (Bot. 101)	2	
Diseases of Vegetable Crops (Bot. 104)		2
Approved Electives	4	5
	—	—
	16	16

(c) Floriculture.

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219)	3	
Floriculture (Hort. 401)	2	
Landscape Gardening (Hort. 301)		2
Plant Materials (Hort. 305, 306)	3	3
Greenhouse Construction (Hort. 403)		3
Introductory Entomology (Ento. 301)	2	
Entomology of Truck and Field Crops (Ento. 303).....		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	4	4
	<hr/>	<hr/>
	17	17
Senior Year.		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Forcing Flowers (Hort. 405, 406)	3	3
Agricultural Bacteriology (Bact. 501)	3	
Forcing Vegetables (Hort. 205, 206)	2	2
Advanced Plant Breeding (Hort. 127, 128).....	3	3
Diseases of Vegetable Crops (Bot. 104)		2
Approved Electives	2	3
	<hr/>	<hr/>
	16	16

(d) Landscape Gardening.

	Semester	
	1st	2nd
Freshman Year.		
Modern English Prose (Eng. 81, 82)	3	3
Plane Surveying (C. E. 222)		5
Modern Language (French, German or Spanish, first Yr.)	3	3
Library Practice (Libr. 1)		$\frac{1}{2}$
Hygiene (Phys. Ed. 10)		$\frac{1}{2}$
Agricultural Botany (Bot. 41, 42)	3	3
Trigonometry (Math. 11)	3	
Architectural Drawing (Arch. 601)	3	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Approved Elective	1	1
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Sophomore Year.

American Literature (Eng. 71, 72)	3	3
Modern Language (French, German or Spanish, second Yr.)	3	3
Topographical Surveying (C. E. 223)	5	
Railroad and Canal Surveying (C. E. 272)		5
Principles of Fruit Growing (Hort. 101)	3	
Landscape Gardening (Hort. 301)		2
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
Approved Electives	3	4
	<hr/>	<hr/>
	18 $\frac{1}{2}$	18 $\frac{1}{2}$

*It is suggested that four of these elective credits be taken in Architectural drawing and Perspective, such as Arch. 602, Arch. 518.

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219)	3	
Composition of Addresses (Eng. 103, 104)	2	2
Water Color Rendering (Arch. 505, 506)	2	2
Floriculture (Hort. 401)	2	
Plant Materials (Hort. 305, 306)	3	3
Hist. and Lit. of Landscape Architecture (Hort. 311)....		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	3	6
	—	—
	17	17
Senior Year.		
National Government (Com. 320)	3	
Constitutional Law and Politics (Com. 322)		3
Theory and Design (Hort. 307, 308)	2	3
Town Planning (Hort. 313)	3	
Field Practice (Hort. 309, 310)	3	3
Approved Electives	5	7
	—	—
	16	16

COURSES IN POULTRY HUSBANDRY.

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219)	3	
Poultry Husbandry (Poultry Hus. 1, 2)	4	4
Embryology and Histology (Zool. 104, 105)	3	3
Markets and Marketing (Poultry Hus. 7)	2	
Feeds and Feeding (Poultry Hus. 10)		2
Anatomy of the Fowl (Vet. Med. 11)	2	
Poultry Diseases (Vet. Med. 12)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	1	4
	—	—
	17	17
Senior Year.		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Advanced Poultry Husbandry (Poultry Hus. 3, 4)	4	6
Genetics (Zool. 120)	3	
Farm Management (Agron. 505)		3
Approved Electives	6	4
	—	—
	16	16

COURSE IN FARM BUSINESS AND RURAL LEADERSHIP.

	Semester	
	1st	2nd
Junior Year.		
Economic History of the U. S. (Com. 206)	3	
Rural Finance (Com. 265)		3
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Genetics (Zool. 120)	3	
Practical Sociology (Com. 250)		3
Cooperative Accounting and Management (Com. 130)....	3	
Dairy Herd Management (D. H. 40)		3
Soil Fertility (Agron. 107)	3	
Feeds and Feeding (A. H. 23)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	—	—
	17	17

Senior Year.

Public Finance (Com. 233)	3	
Comparative Governments (Com. 325)		3
Economic Organization of Agriculture (Com. 264).....	3	
Rural Sociology (Com. 252)		3
Literature and Exposition of the Rural Life (Com. 255)..	3	
Farm Management (Agron. 505)		3
Forage Crops (Agron. 203)	2	
Elementary Laboratory Bacteriology (Bact. 102).....		2
Practical Pomology (Hort. 102)	2	
Approved Electives	3	5
	—	—
	16	16

OTHER COURSES.

In the courses of this group, which for convenience has been designated the agricultural science group as distinguished from the farm practice group already outlined, students are allowed to major in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology. The purpose of the courses is to train students for agricultural college and experiment station positions in these various sciences; for work in the scientific bureaus of the U. S. Department of Agriculture; for positions as fruit inspectors; and for technical positions in State and government fish and game propagation work.

	Semester	
	1st	2nd
Freshman Year.		
Modern English Prose (Eng. 81, 82)	3	3
Modern Language (German or French first year).....	3	3
Principles of Economic Zoology (Zool. 108, 109).....	3	3
General Physics (Phyc. 1, 2)	3	3
General Chemistry (Chem. 100, 101)	3	3
Gymnasium (Phys. Ed. 15, 16)	½	½
Library Practice (Libr. 1)	½	
Hygiene (Phys. Ed. 10)	½	
Drill (Military 1, 2)	1	1
	<hr/>	<hr/>
	17½	16½

Sophomore Year.		
Modern Language (German or French, second year)....	3	3
Agricultural Botany (Bot. 41, 42)	3	3
Agricultural Chemistry (500, 501)	3	3
Soils (Agron. 101)	3	
Crop Production (Agron. 201)		3
Elementary Bacteriology (Bact. 101)	3	
Organic Chemistry (Chem. 201)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	½	½
	<hr/>	<hr/>
	16½	16½

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
*Major and Minor Electives	12	15
	—	—
	17	17

Senior Year.		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322).....		3
*Major and Minor Electives	13	13
	—	—
	16	16

COURSE IN AGRICULTURE FOR TEACHERS.

	Semester	
	1st	2nd
Junior Year.		
Agricultural Economics (Com. 219)	3	
General Psychology (Ind. Ped. 101).....	3	
School Management (Ind. Ped. 130)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	9	12
	—	—
	17	17

Senior Year.		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322)		3
General Methods (Ind. Ped. 140)	2	
Special Methods in Agriculture (Ind. Ped. 150)		3
Extension Methods in Agriculture (Ind. Ped. 151)		1
Composition of Addresses (Eng. 103)	2	
Approved Electives	8	9
	—	—
	16	16

*Not less than five credits per semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

DEGREE COURSE IN AGRICULTURE.

(For those entering in February.)

1st Year.	Semester	
	1st	2nd (Fresh.)
Modern English Prose (Eng. 82)		3
Crop Production (Agron. 201)		3
Woodwork (Ind. Arts 106)		1
Vegetable Growing (Hort. 201)		2
Elements of Dairying (D. H. 1)		3
Live Stock Management (A. H. 2)		3
Library (Lib. 1)		$\frac{1}{2}$
Drill (Military 2)		1
Gymnasium (Phys. Ed. 16)		$\frac{1}{2}$
Hygiene (Phys. Ed. 10)		$\frac{1}{2}$
		<hr/>
		17 $\frac{1}{2}$

2nd Year.

	(Fresh.) (Soph.)	
Modern English Prose (Eng. 81)	3	
General Chemistry (Chem. 100, 101)	3	3
General Physics (Physics 1, 2)	3	3
Agricultural Botany (Bot. 41, 42)	3	3
Soils (Agron. 101)	3	
Stock Judging (A. H. 2)	2	
Farm Surveying and Leveling (C. E. 242)		2
Electives (Major and Minor)		6
Drill (Mil. 1, 4)	1	1
Gymnasium (Phys. Ed. 15, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	18 $\frac{1}{2}$	18 $\frac{1}{2}$

SCHOOL OF FORESTRY.

The State of Oregon is the most important timber state in the Union. The present stumpage is estimated at more than 480 billion feet, board measure. This immense property represents approximately one-fifth of the standing timber remaining in the United States. About three-fourths of this amount is in private holdings. The greater part of this will doubtless be cut within the next twenty-five years. That held by the Federal government, in the National Forests, covering an area of more than 16,000,000 acres, will be cut as the needs of the people require, but the land will be devoted to the production of new timber crops, for all time to come.

The courses in Logging Engineering and in General Forestry are designed to prepare men to be of use in harvesting and in caring for this great forest crop. In both courses the student is given thorough training in plane and topographic surveying. In addition to these subjects, each course deals with matters pertaining to its particular field. The man who plans to engage in general forestry work receives instruction in forest botany, silviculture, mensuration, dendrology, timber technology, and forest management; while the man who proposes to go into the logging business is instructed in timber cruising, railroad surveying, bridge construction, the principles of steam engines and electric motors, and general logging devices and equipment.

In addition to the purely technical subjects, the student is required to take courses in economics, sociology, and government; for it is realized that it is as much the duty of the College to develop good citizens as it is to create efficient producers.

The industrial work is shaped, so far as practicable, to fit the peculiar conditions existing in the Pacific Northwest, and in Oregon in particular. Men in both courses are expected to devote the summer months to practical work in the woods and in the camps. During the college year frequent trips are made to adjacent forests, to nearby logging operations, to mills, to wood distillation plants, creosote works, and factories. Practical work in timber cruising, map making, and inspection and planning of logging operations may be done by the student at very small cost. The watershed which supplies the city of Corvallis, is at the disposal of the School of Forestry for the demonstration of scientific methods. All things

considered, the School of Forestry offers exceptional advantages to the man who wishes to study forestry or logging from the practical as well as from the theoretical standpoint.

Forester's Short Course.

(November 1, 1915, to April 7, 1916.)

This course is designed to be of assistance to those who wish to enter the non-technical branches of the Forest Service, and to those who wish to engage in State forestry work. The standard of work, both in the State and in the Federal Service, is constantly advancing. Every man who desires to continue in either of these branches must keep abreast of this advancing standard. He should be able to do this through a medium of some or all the subjects offered in this course.

	Semester	
	1st	2nd
Forest Protection (For. A. B.)	3	3
Forest Measurements (For. C. D.)	3	3
Forest Surveying and Mapping (For. E. F.)	3	3
Forest Improvements (For. G. H.)	3	3
Forest Administration (For. K. L.)	1	1
	—	—
	13	13

DEGREE COURSE IN GENERAL FORESTRY.

Freshman Year.	Semester	
	1st	2nd
Modern English Prose (Eng. 81, 82)	3	3
Trigonometry (Math. 14)	3	
Elementary Aanalysis (Math. 34)		3
General Forestry (Forestry 101)	4	
Surveying (C. E. 232)		4
General Chemistry (Chem. 100-101)	3	3
Forest Botany (Botany 30, 31)	3	3
Library Practice (Lib. 1)	½	
Hygiene (Phys. Ed. 10)	½	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	½	½
	—	—
	18½	17½

	Semester	
	1st	2nd
Sophomore Year.		
General Physics (Physics 1, 2)	3	3
General Zoology (Zool. 101, 102)	3	3
Topographic Surveying (C. E. 233)	4	
Forest Pathology and Taxonomy (Bot. 35)		4
Silviculture (Forestry 201-202)	3	3
Forest Geology (Mining 161)	3	
Forest Protection (Forestry 505)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	½	½
	<hr/>	<hr/>
	17½	17½

The following are courses recommended for the junior and senior years.

Junior Year.

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Forest Mensuration (301-302)	6	4
Forest Entomology (Entom. 304)		3
Advanced Silviculture (Forestry 203, 204)	3	2
Elementary Economics (Com. 210)	3	
Forest History and Economics (Forestry 103)		3
Military Science (Theo. Inst. 1, 2)	1	1
Drill (Military 5, 6)	1	1
	<hr/>	<hr/>
	17	17

Senior Year.

Management (Forestry 401-402)	5	5
Dendrology (Forestry 501)	5	
Lumbering (Forestry 404)		5
Forest Improvement (Forestry 405)	5	
Timber Technology (Forestry 502)		4
Timber Testing (Exp. E. 238)		1
Seminar (Forestry 408-409)	1	1
	<hr/>	<hr/>
	16	16

DEGREE COURSE IN LOGGING ENGINEERING.

	Semester	
	1st	2nd
Freshman Year.		
Modern English Prose (Eng. 81, 82)	3	3
Trigonometry (Math. 14)	3	
Elementary Analysis (Math. 34)		3
General Forestry (Forestry 101)	4	
Surveying (C. E. 232)		4
General Chemistry (Chem. 100-101)	3	3
Woodwork (Ind. Arts 110, 111)	2	2
Library Practice (Lib. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Sophomore Year.		
Engineering Physics (Physics 101-102)	4	4
Principles of Economics (Com. 210)	3	
Labor Problems (Com. 213)		3
Blacksmithing (Ind. Arts 151)	2	
Toolmaking and Tempering (Ind. Arts 152)		1
Machine Shop (Ind. Arts 202)		1
Topographic Surveying (C. E. 233)	4	
Railroad Surveying (C. E. 274)		4
Mechanical Drawing (M. E. 151)	2	
Forest Protection (Forestry 505)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

The following courses are recommended for the junior and senior years.

	Semester	
	1st	2nd
Junior Year.		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Mensuration (Forestry 301-302)	6	4
Logging Railroads (Forestry 601)	3	
Dendrology (Forestry 504)		3
Logging Materials (Exp. E. 240)		2
Elements of Steam Engineering (M. E. 303).....	2	
Steam Laboratory (Exp. E. 255)	1	
Mechanism (M. E. 204)		3
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6)	1	1
	—	—
	17	17
Senior Year.		
Logging Engines (Forestry 602)	4	
Bridge Construction (Forestry 603)		3
Logging Devices and Equipment (For. 604, 605)	5	4
Lumbering (Forestry 404)		5
Management (Forestry 401)	5	
Timber Technology (Forestry 502)		4
Timber Testing (Exp. E. 238)	1	
Electrical Machinery (E. E. 403)	3	
	—	—
	17	17
Electrical Lumbering Machinery (E. E. 404)		2
Special Subjects (Forestry 606)		2
Logging Management (For. 407)		3

SCHOOL OF HOME ECONOMICS.

The School of Home Economics offers the following courses of study: a one-year vocational course entitled the Home Makers' Course; a four-weeks course in Food Preparation, Dressmaking, Textiles, etc., which is offered in connection with the Winter Short Course; a six-weeks course for teachers, offered in connection with the work of the Summer School; a night course of twelve weeks for women of mature years; and four four-years courses, each of which leads to the degree of Bachelor of Science.

Vocational Courses. The one-year course for Home Makers is provided especially for those women whose schooling may not qualify them to enter the degree courses, whose duties demand that they shall content themselves with a brief period of training for their life work, or whose aim in seeking training at the College is exclusively technical or vocational. The purpose of the other short courses in Home Economics is quite similar to this—to provide, in the short time assigned to the particular courses, the fullest and most fruitful training that is possible to offer with the facilities of a thoroughly modern School of Home Economics, and to present this training in such a way that it shall be most immediately and constructively helpful to the particular patrons of the given course. Only the one-year vocational course and the regular degree courses are outlined here, the others being presented in the usual special bulletins issued for the Winter Short Course and the Summer School. Admission to any of the vocational courses demands an educational qualification not greater than an eighth grade or common school course; and in the instance of mature persons, otherwise capable of carrying on the work, even this qualification may be waived.

Degree Courses. Admission to the degree courses requires the completion of at least three years' work in a standard high school. These courses are planned fundamentally to equip women for their normal life service, that of home makers. While the first three years of all the courses are identical, opportunity is given during the senior year to specialize in any one of four fields; namely, Domestic Science, Domestic Art, Home Administration, and Institutional Management.

Fundamentally, the young women in the School of Home Economics are offered such training as will help them to be prepared

to adjust themselves readily to their environment. Since the relation of women to the economic world has undergone great changes during the last one or two decades, it follows that the education of young women must be such that it will prepare them to be efficient and serviceable to their community.

That the young women completing this course may be good citizens as well as good housekeepers; good business managers in their homes, as well as good cooks; broadly educated women, as well as specially trained workers, the courses of study in the School of Home Economics have been planned to give a liberal as well as a technical education.

Many opportunities are open for the woman capable of solving the problems of good food service for large numbers of people, and for experts in the management of large institutions. Equally attractive opportunities are available for the expert needlewoman, the tasteful designer of gowns, the competent dressmaker or milliner, the ladies' tailor, and the woman with artistic resources as a household decorator and furnisher. Opportunities for teaching Home Economics, not only in the high schools and colleges, but as supervisors in the common schools of cities, and in the consolidated community schools of progressive rural communities, are becoming more general and more desirable. Facilities for specializing in this work at the College are therefore given special attention.

More and more the life of the modern community is dependent upon institutions. Women are rapidly taking their places as executive and administrative leaders in the important functions of these institutions. Hospitals, Institutional Homes, Asylums, Educational Institutions, and Social Centers, are more and more demanding the service of the women of skilled technical accomplishments. There is a growing demand for dietiticians in the hospitals and large institutions. The training in dietetics, catering, and business management offered the young women at the College through the School of Home Economics, assists in the liberal and practical preparation for this employment.

Quartered in a new building, provided with a thoroughly practical modern heating, ventilating, and sanitary system, and equipped with the most approved facilities for conducting the work of the various departments, the School of Home Economics is in a very fortunate position for making its courses of the ut-

most value to its patrons—not only to its resident students, but to the communities of the State at large wherever its extension activities may penetrate.

Home Makers' Course.

	Semester	
	1st	2nd
Food Preparation (D. S. H. 1)	5	5
Care of Children (D. S. J)		1
Hand Sewing and Garment Making, Dressmaking (D. A. K, L)	4	4
Sanitation and Care of the Home (D. S. K)	2	
Personal Hygiene (D. S. L)	2	
Preventive Medicine (Bact. 307)	1	
Home Nursing and Invalid Cookery (D. S. M)		2
House Furnishing (D. A. N)		2
Gymnasium (Phys. Ed. 1, 2)	1	1
	—	—
	15	15

DEGREE COURSE IN HOME ECONOMICS.

	Semester	
	1st	2nd
Freshman Year.		
General Chemistry (Chem. 102, 103)	3	3
Hand Sewing, Garment Making (D. A. 101, 102)	3	3
Freehand Drawing, Beginning Composition (Art 102, 103)	2	2
College Rhetoric (Eng. 31, 32)	3	3
*Principles of Botany (Bot. 20)	4	
Functional Zoology (Zool. 103)		3
Library Practice (Libr. 1)	½	
Hygiene (Phys. Ed. 10)	½	
Home and Private Business Management (Com. 122)..		2
Gymnasium (Phys. Ed. 5, 6)	1	1
	—	—
	17	17

	Semester	
	1st	2nd
Sophomore Year.		
Organic Chemistry, Chemistry of Foods (Chem. 200, 462)	4	4
Food Preparation (D. S. 101, 102)	3	3
Design and Color (Art 204)	2	
Household Physics (Phys. 131)	4	
Household Bacteriology (Bact. 300)		3
Home Nursing (D. S. 511)		3
Essay, Drama (Eng. 51, 52)	3	3
Gymnasium (Phys. Ed. 7, 8)	1	1
	—	—
	17	17

Junior Year.

Principles of Economics, Practical Sociology (Com. 211, 251)	2	2
*Modern Language (French, German, or Spanish first year)	3	3
Food Preparation (D. S. 104, 105)	3	3
Physiology (Zool. 207, 208)	3	3
House Sanitation (D. S. 301)	2	
Housewifery (D. S. 510)		2
Dressmaking (D. A. 201, 202)	3	3
	—	—
	16	16

Senior Year.

*Modern Language (French, German, or Spanish second year)	3	3
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Psychology (Ind. Educ. 101)	3	
House Decoration and Furnishing (D. A. 501)	3	
House Administration (D. S. 501)		3
Electives	4	7
	—	—
	16	16

*Students presenting credits for two years' study in any one foreign language may elect other subjects in place of modern language as required in the above course.

The following group electives are suggested. Other electives may be taken with the consent of the Dean of the School.

	Semester	
	1st.	2nd
(a) Domestic Science.		
Dietetics (D. S. 201)	4	
Invalid Cookery (D. S. 202)		2
Ind. Educ. (160)	3	3
(b) Domestic Art.		
Adv. Dressmaking (D. A. 203, 204)	3	3
Adv. Textiles (D. A. 601)		2
Costume Design (D. A. 701)	2	
Ind. Educ. (160, 161)	3	3
(c) Home Administration.		
Dietetics (D. S. 201)	4	
Invalid Cookery (D. S. 202)		2
Adv. Dressmaking (D. A. 203, 204)	3	3
Handwork and Weaving (D. A. 405)		2
(d) Institutional Management.		
Dietetics (D. S. 201)	4	
Invalid Cookery (D. S. 202)		2
Institutional Management (D. S. 504)	3	
Catering (D. S. 210)		6
(e) Education.		
History of Education (Ind. Educ. 120)		3
General Methods (Ind. Educ. 140)	3	
Ind. Educ. (160, 161)	3	6
(f) Applied Design.		
Basketry (D. A. 402)	2	
Handwork and Weaving (D. A. 405)		2
Design (Art. 204)	2	
Clay Modeling (Art. 413, 414)	2	2
Metal Work (Art. 600, 601)	2	2

SCHOOL OF ENGINEERING.

Four-year courses leading to the degree of Bachelor of Science are offered in the School of Engineering as follows:

- A course in Civil Engineering.*
- A course in Electrical Engineering.
- A course in Mechanical Engineering.
- A course in Highway Engineering.
- A course in Irrigation Engineering.
- A course in Industrial Arts.

A three-year vocational course in Mechanic Arts is also offered. While this course does not lead to a degree, a certificate or diploma will be awarded to those students who complete it.

COURSE IN CIVIL ENGINEERING.*

The purpose of this course is to give the student thorough theoretical instruction, accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, and Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department. The student has the opportunity, during the senior year, to select his work along lines that he is most interested in.

Recognizing the value of drawing to the professional engineer, not only as a means of expressing his ideas and of carrying out his plans, but also as a means by which the young graduate may enter some of the most desirable positions, the department lays special emphasis upon this subject. Much drawing is also required in connection with the preparation of plans and working drawings, as part of the office work of the higher technical courses.

The work in Surveying begins with the freshman year, and continues through the sophomore year, with from six to nine hours of field practice a week. The student serves in subordinate positions at first, and gradually advances as a knowledge of the instruments is acquired. After having served his term as an apprentice, he is placed in charge of field parties and is held responsible for the results accomplished. During the freshman year he is given

*No work below junior grade will be given in Civil Engineering during the year 1915-16.

practice in land surveying and leveling, and during the sophomore year in topographic and railroad surveying. At all times, conscientious attention to duty, accuracy, and speed will be demanded. Every student keeps full and accurate notes of all work done in the field. These, after being criticised, are transcribed and filed with the instructor.

DEGREE COURSE IN CIVIL ENGINEERING.

	Semester	
	1st	2nd
Junior Year.		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Roads and Pavements (C. E. 405)		3
Graphic Statics (C. E. 511)	2	
Hydraulics (I. E. 102)		3
Cement and Highway Laboratory (Exp. E. 231).....	2	
Structural Materials Laboratory (Exp. E. 232).....		3
Military Science (Theo. Inst. 1, 2).....	1	1
Masonry and Foundations (C. E. 552)		3
Drill (Military 5, 6)	1	1
*Electives (Restricted)	3	3
Senior Year.		
Highway Bridges (C. E. 513, 514)	4	4
Engineering Seminar (C. E. 605, 606)	1	1
Reinforced Concrete (C. E. 557)	4	
Contracts and Specifications (C. E. 607)		2
Electives (Either group 1, 2, 3, 4)	7	9
	—	—
	16	16

*Approved electives—English, Modern Language, Economics, Constitutional Law, State and Municipal Governments, Geology, Differential Equations, Least Squares.

The following group electives are suggested. Other studies may be arranged for by consultation with the head of the department.

	Semester	
	1st	2nd
Group 1.		
Highway Engineering (C. E. 407)	4	
Economics of Highway Construction (C. E. 410).....		2
Highway Laboratory (Advanced) (Exp. E. 233).....	2	
Road Machinery (M. E. 302)		1
Precise Surveying and Geodesy (C. E. 252).....		3
Electives	1	3
	—	—
	7	9
Group 2.		
Sanitary Engineering (I. E. 701)	3	
Hydraulics Laboratory (Exp. E. 262)		2
Water Supply Engineering (I. E. 301)	4	
Hydraulic Pumps and Motors (I. E. 202) or Chemistry of Water (Chem. 403)		2
Study of Electric Machinery (E. E. 402)		4
Electives		1
	—	—
	7	9
Group 3.		
Structural Engineering (C. E. 515, 516)	3	2
Study of Electric Machinery (E. E. 402)		4
Electives	4	3
	—	—
	7	9
Group 4.		
Railway Engineering (C. E. 281, 282)	3	3
Study of Electric Machinery (E. E. 402)		4
Electives	4	2
	—	—
	7	9

COURSE IN ELECTRICAL ENGINEERING.

Courses. Since the advent of steam as a motive power, it is probable that no agency has so deeply affected the course of history and the intimate life of a large proportion of the human race as has the electric current, whether used in the transmission of intelligence, to furnish light, or to provide power for transportation and the industries.

Already the electrical industries are counted among the greatest in the world; their employees number more than a hundred thousand in the United States alone; their business in this country doubles every five years; and their field is ever expanding.

Notwithstanding this fact, most of the business is controlled by comparatively few corporations. The competition for desirable positions is therefore keen; and since the field in Electrical Engineering for the independent engineer is limited, only men of exceptional ability and energy attain the higher and more desirable positions.

Accordingly, no man is advised to take Electrical Engineering who does not consider himself, by taste and ability, exceptionally fitted therefor.

The College course is designed especially to train the young engineer in the theory of his profession, such practical work as is given in shop and laboratory being subordinated to this end. Practical acquaintance with actual conditions can be acquired only in the field, during vacation and after graduation. For this reason, and in order to supplement his college education, the student is urged to spend at least a part of his vacation in some line of electrical industry.

Starting with the foundation subjects of mathematics, science, drawing, and shopwork, the student proceeds through the study of form expression in Descriptive Geometry, Mechanism, the laws of Mechanics, Strength of Materials, stress in structures and machinery; through the study of electricity and its application to machinery, the characteristic performance of electrical apparatus, its design and operation; through the study of thermodynamics as applied to various types of heat engines, and finally to the composite power system involving the steam or hydro-electric power plant and the system for transmitting and distributing electrical energy.

DEGREE COURSE IN ELECTRICAL ENGINEERING.

	Semester	
	1st	2nd
Freshman Year.		
Trigonometry, College Algebra (Math. 11, 21)	5	
Elementary Analysis (Math. 31)		5
General Physics (Phys. 1, 2)	3	3
Mechanical Drawing (M. E. 151)	2	
Descriptive Geometry (M. E. 152)		3
Foundry (Ind. Arts 171)	2	
Woodworking (Ind. Arts 112)		2
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Modern English Prose (Eng. 81, 82) or Adv. German or Adv. French (Mod. Lang. 207, 208, or 107, 108)*	3	3
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Sophomore Year.		
Differential and Integral Calculus (Math. 51, 52)	4	4
Electrical Physics (Physics 105)	3	
Electrical Measurements (Physics 106)		3
General Chemistry (Chem. 10, 11)	3	3
Survey of Electrical Industries (E. E. 121, 122)	1	1
Mechanical Drawing (M. E. 153)	3	
Mechanism (M. E. 204)		3
Blacksmithing (Ind. Arts 151)	2	
Machine Shop (Ind. Arts 206)		2
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

*By special permission a student may elect beginning German or French, (Modern Language 201, 202, or 101, 102). Modern language elected in the freshman year must be continued in the sophomore year.

	Semester	
	1st	2nd
Junior Year.		
Electrical Engineering (E. E. 101, 102)	4	4
Electrical Engineering Laboratory (E. E. 201, 202).....	3	3
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Theory and Practice of Steam Engineering (M. E. 305)..	3	
Hydraulics (I. E. 102)		3
Plane Surveying (C. E. 254)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	—	—
	17	17

Senior Year.

Electrical Engineering (E. E. 103, 104).....	4	3
Electrical Design (E. E. 106)		1
Electrical Laboratory (E. E. 203)	3	
Electric Railways (E. E. 309)	2	
Illuminating Engineering (E. E. 316)		2
Telephony and Telegraphy (E. E. 313)	2	
Applied Mechanics Laboratory (Exp. E. 205)	3	
Power and Hydraulic Laboratory (Exp. E. 206)		3
Optional	2	7
	—	—
	16	16

Suggested Options.

Advanced Steam Engineering (M. E. 306)	3	
Public Service Regulation (E. E. 317)	2	
Periodical Literature (E. E. 301)	1	
Central Stations (E. E. 318)		2
Electrical Laboratory (E. E. 204)		3
Electric Railways (E. E. 310)		3
Railway Signalling (E. E. 312)		2
Thesis (E. E. 306)		2

COURSES IN MECHANICAL ENGINEERING.

The course in Mechanical Engineering has for its purpose the preparation of young men for positions of usefulness and responsibility in the industrial life of the country.

The Pacific Northwest is just now entering upon a period of rapid progress in the building of railroads, the development of water power, the marketing of forest products, and the upbuilding of manufactories, all of which require men conversant with the general principles of engineering. It is the purpose of all engineering courses to contribute to this general advancement, by turning out graduates equipped with the necessary knowledge and skill to make them active factors in this great work.

It is the general plan of the course in Mechanical Engineering to lay a broad foundation in English, Mathematics, Chemistry, and Physics, accompanied by Drawing and Shopwork, during the first two years of the course. The work of the last two years is more technical and professional in its nature, consisting in a study of the principles involved in the development of power by steam engines, water wheels, gas and gasoline engines, and steam turbines. It also involves a critical study of the design of machines and materials entering into their construction, as well as tests to determine their efficiency.

Instruction is given by means of lectures, recitations, and laboratory exercises. The scientific principles involved in machines and mechanical movements to the solution of problems in mechanical engineering. In the shops, the student learns the use of tools and the value of different methods of doing work from the standpoint of economical construction. In the draughting room, he learns to make working drawings and blueprints of machines, and to formulate designs of his own.

With these advantages to aid him, the ambitious student should be able to take and maintain a position in the general industrial and engineering development which is the leading and characteristic feature of the age in which we live.

DEGREE COURSE IN MECHANICAL ENGINEERING.

	Semester	
	1st	2nd
Freshman Year.		
Modern English Prose (English 81, 82)*.....	3	3
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem. 100, 101)	3	3
Mechanical Drawing (M. E. 151)	2	
Descriptive Geometry (M. E. 152)		3
Foundry (Ind. Arts 171)	2	
Patternmaking (Ind. Arts 131)		2
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Sophomore Year.		
Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Physics 101, 102)	4	4
Mechanical Drawing (M. E. 153)	3	
Mechanism (M. E. 204)		3
Commercial Geography (Com. 202)*	3	
Principles of Economics (Com. 212)*		3
Blacksmithing (Ind. Arts 151)	2	
Toolmaking and Tempering (Ind. Arts 152)		1
Machine Shop (Ind. Arts 202)		1
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

*Upon approval of the Dean, students may substitute a Modern Language for English in the freshman year and for Commercial Geography and the Principles of Economics in the sophomore year.

	Semester	
	1st	2nd
Junior Year.		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Theory and Practice of Steam Engineering (M. E. 305) ..	3	
Advanced Steam Engineering (M. E. 306)		3
Applied Mechanics Laboratory (Exp. E. 201)	3	
Power and Hydraulic Laboratory (Exp. E. 202)		3
Graphic Statics (C. E. 511)	2	
Machine Shop (Ind. Arts. 203, 205)	2	3
Military Science (Theo. Inst. 1, 2)	1	1
Drill (Military 5, 6)	1	1
Hydraulics (I. E. 102)		3
	—	—
	17	17
Senior Year.		
Machine Design (M. E. 205, 206)	4	3
Steam Boilers (M. E. 309)	2	
Electrical Machinery (E. E. 403)	3	
Steam Power Plant Design (M. E. 316)		3
Advanced Mechanics Laboratory (Exp. E. 203)	3	
Advanced Power Laboratory (Exp. E. 204)		3
Gas Engine Laboratory (Exp. E. 272)		2
Internal Combustion Motors (M. E. 346)		2
Heating and Ventilating (M. E. 331)	3	
Seminar (M. E. 351, 352)	1	1
Elective		2
	—	—
	16	16

*Upon approval of the Dean, students may substitute a Modern Language for English in the freshman year and for Commercial Geography and the Principles of Economics in the sophomore year.

COURSE IN HIGHWAY ENGINEERING.

There are few lines of public endeavor where more money is being spent, or where a higher degree of technical skill and training is required, than in the field of highway engineering. The purpose of this course is to meet the demand in this State and throughout the Northwest for men equipped to take charge of road

and city street construction and maintenance work. Aside from the opportunity for useful and honorable service, no field, it is believed, offers greater encouragement in a financial way to the young man of ambition and ability.

Thorough theoretical instruction is accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, Drawing, Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department.

The department of Experimental Engineering is equipped with complete and thoroughly up-to-date testing laboratories, including the very latest and best cement and highway testing machinery, thus affording students in Highway and in Civil Engineering courses the opportunity of studying first hand the strength and properties of the various engineering materials.

In the study of highways, special reference is made to the conditions and needs of Oregon. Due consideration is given to the construction and maintenance of dirt, gravel, and broken stone roads as well as to the higher types. In consequence of the vast area of the State, this class of roads must, of necessity, constitute the greater part of its highways for many years.

DEGREE COURSE IN HIGHWAY ENGINEERING.

Freshman Year.	Semester	
	1st	2nd
Trigonometry, College Algebra (Math. 11, 21)	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem. 100, 101)	3	3
Mechanical Drawing (C. E. 107)	3	
Engineering Drawing (C. E. 111)		3
Descriptive Geometry (M. E. 152)	3	
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Plane Surveying (C. E. 222)		5
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2)	1	1
Spherical Trigonometry (Math. 15)	1	
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	Semester	
	1st	2nd
Sophomore Year.		
Differential Calculus, Integral Calculus (Math. 51, 52) ..	4	4
Engineering Physics (Phys. 101, 102)	4	4
Topographic Surveying (C. E. 223)	5	
Railroad and Canal Surveying (C. E. 272)		5
Gymnasium (Phys. Ed. 17, 18)	1/2	1/2
Drill (Military 3, 4)	1	1
Electives (Restricted)	3	3
	<hr/> 17 1/2	<hr/> 17 1/2

Junior Year.

Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Roads and Pavements (C. E. 405)	3	
Graphic Statics (C. E. 511)	2	
Hydraulics (I. E. 102)		3
Cement and Highway Laboratory (Exp. E. 231)	2	
Structural Materials Laboratory (Exp. E. 232)		3
Military Science (Theo. Inst. 1, 2)	1	1
Masonry and Foundations (C. E. 552)		3
Drill (Military 5, 6)	1	1
*Electives (Restricted)	3	3
	<hr/> 17	<hr/> 17

Senior Year.

Highway Bridges (C. E. 513, 514)	4	4
Engineering Seminar (C. E. 605, 606)	1	1
Reinforced Concrete (C. E. 557)	4	
Contracts and Specifications (C. E. 607)		2
Road Machinery (M. E. 302)	1	
Highway Engineering (C. E. 407, 408)	4	4
Economics of Highway Construction (C. E. 410)		2
Advanced Highway Laboratory (Exp. E. 233)	2	
**Electives		3
	<hr/> 16	<hr/> 16

*Approved Electives: English, Modern Language, Economics, National Government, State and Municipal Governments, Geology, Differential Equations, Least Squares.

**Chemistry of Road Materials, Design of Highway Structures or Materials Laboratory (Advanced Course).

IRRIGATION ENGINEERING.

Successful agriculture in the arid parts of Oregon is based on the science of irrigation. The widespread development of irrigation lands in this and other states of the arid west, by means of both gravity supplies and pumping systems, has extended the necessary qualifications of the engineer to include a knowledge of irrigation methods, pumping, and power machinery. The province of the engineer, therefore, comprises the development, conservation, and economical use of limited water supplies. In recognition of the need, in the Pacific Northwest, for Engineers trained in irrigation and hydraulics, the course in Irrigation Engineering has been established.

Realizing, however, that the young engineer is frequently obliged to take charge of work which properly falls outside of the field in which he has specialized, the course in Irrigation Engineering is arranged to cover as broad a field as practicable, in order that the graduate may experience little difficulty in accommodating himself to the available positions. The curriculum in this department has for its purpose, in the freshman and sophomore years, the laying of a foundation on which to build the more specialized and technical work of the junior and senior years. The last two years are intended to equip the student with a well-rounded knowledge of hydraulics and irrigation engineering—a knowledge which will enable the student to hold a responsible position in reclamation work.

The work of this department is designed to furnish a thorough course of theoretical instruction accompanied by practice in the various lines of irrigation engineering. The course, moreover, is made practical by a large proportion of laboratory and field practice in conjunction with the theoretical work. Special stress is laid on the solution of problems, and experiments in the laboratory. Emphasis is laid on skill in handling surveying and water-measuring instruments. The student is taught how to make stream measurements, design, lay out, and construct dams, canals, headworks, diversion weirs, flumes, pipe lines, and distributing systems.

Inspection trips are conducted in the junior and senior years to afford the students an opportunity to familiarize themselves with actual engineering work.

Electives. Ample opportunity is given the student to elect courses outside of the School of Engineering. This provision is made that the student may be encouraged to study Economics, Political Science, Accounting, English, and Modern Languages, a knowledge of each of which is helpful, if not essential, in the engineering profession.

DEGREE COURSE IN IRRIGATION ENGINEERING.

	Semester	
	1st	2nd
Freshman Year.		
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem 100, 101)	3	3
Mechanical Drawing (C. E. 107)	3	
Engineering Drawing (C. E. 111)		3
Descriptive Geometry (M. E. 152)	3	
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Plane Surveying (C. E. 222)		5
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2)	1	1
Spherical Trigonometry (Math. 25)	1	
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Sophomore Year.		
Differential Calculus, Integral Calculus (Math. 51, 52) ..	4	4
Engineering Physics (Physics 101, 102)	4	4
Topographic Surveying (C. E. 223)	5	
Railroad and Canal Surveying (C. E. 272)		5
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4)	1	1
Electives (Restricted)	3	3
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Semester

Junior Year.

1st 2nd

Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Roads and Pavements (C. E. 405)	3	
Graphic Statics (C. E. 511)	2	
Hydraulics (I. E. 102)		3
Cement and Highway Laboratory (Exp. E. 231)	2	
Structural Materials Laboratory (Exp. E. 232)		3
Masonry and Foundations (C. E. 552)		3
Military Science (Theo. Inst. 1, 2)	1	1
Drill (Military 5, 6)	1	1
Electives (Restricted)	3	3
	—	—
	17	17

Senior Year.

Engineering Seminar (C. E. 605, 606)	1	1
Reinforced Concrete (C. E. 557)	4	
Contracts and Specifications (C. E. 607)		2
Water Supply Engineering (I. E. 301)	4	
Irrigation Engineering (I. E. 401)	2	
Design of Irrigation Structures (I. E. 402)		2
Hydraulics Laboratory (Exp. E. 262)		2
Hydraulic Pumps and Motors (I. E. 202)		2
Soil Physics (Agron. 103)	3	
Irrigation Farming (Agron. 302)		3
Water Law (I. E. 602)		1
Electives (Approved)	2	3
	—	—
	16	16

The following is a list of approved electives from which the student must choose, as indicated above, two or three credit hours each semester in those years in which elective courses are offered. Unless the student has credit for at least three credit hours of modern languages, he will not be permitted to register for less than twelve credits of any modern language course. Unless satisfactory credits are produced, no student will be permitted to register for less than six credits of economics, when such electives are chosen.

	Semester	
	1st	2nd
Sophomore and Junior Years.		
Modern English Prose (Eng. 81, 82)	3	3
French, German or Spanish (Mod. Lang. 101, 102, 103, 104, 201, 202, 203, 204, 301, 302, 304).....	3	3
Commercial Geography (Com. 202)	3	
Principles of Economics (Com. 212)		3
General Accounting, Special Accounting (Com. 107, 108) 2		3
Senior Year.		
Forage Crops (Agron. 203)	2	
Land Drainage (Agron. 301)		3
Highway Bridges (C. E. 513, 514)	4	4
Water Power (I. E. 204)		3
Electrical Machinery (E. E. 403)	3	
Electric Machine Drives (E. E. 410)		2
Advanced Materials Laboratory (Exp. E. 235).....		2
Climatology (Agron. 303)		1
Irrigation Institutions (Agron. 305)	2	

COURSE IN INDUSTRIAL ARTS.

There is a steadily increasing demand in Oregon for competent teachers of manual training. These instructors teach in both the elementary and high school grades. In fact, the up-to-date school provides for manual, or constructive work of various kinds from the first grade up. The well-trained teacher must therefore understand both the technique and theory of his subject as adapted to the needs of pupils.

Below the sixth grade this manual instruction for both boys and girls is given by the regular grade teachers; but the supervisor and special teacher of manual training should be able to organize this work and correlate it with the other school subjects, and particularly with the later formal course in manual arts. For the boys, this will take the form of instruction in woodworking, metals, machine shop, and in some schools, vocational training in the various trades. For the girls, it will lead to the study of the several phases of home economics.

A college degree course of the same general standard as the other B. S. courses is provided, in order that the young men who

specialize in this field may receive a preparation that will place them on a par with high school teachers in other branches. The relation of industrial instruction in the elementary and secondary schools to the industries of life, is more fundamental and direct than most of the other branches taught. It also has its important relations to higher education. It becomes necessary, therefore, to give these instructors a training that will make them more than masters of the mechanical processes.

The properly prepared teacher of industrial arts must have an appreciative understanding of the origin and development of the industries; their relation to economic, social, and political life; and a profound conviction of the importance and dignity of their contribution to the progress of mankind. He should also have the broad sympathies of the cultured man, in order to enable him to set before his pupils high and worthy ideals of life. The artisan, artist, or professional man is first of all a man and a citizen, and our schools must make him aware of his high privileges and responsibilities.

The Industrial Arts department is a part of the School of Engineering and has under its supervision all the shop courses offered in the other departments of the College.

DEGREE COURSE IN INDUSTRIAL ARTS.

Freshman Year.	Semester	
	1st	2nd
Modern English Prose (Eng. 81, 82)	3	3
Trigonometry (Math. 12)		3
Commercial Geography (Com. 202)	3	
General Chemistry (Chem. 100, 101)	3	3
Shop Drawing (Ind. Arts 301, 302)	2	2
Manual Training (Ind. Arts 103, 104)	3	3
Industrial Arts Drawing (Art 411)		2
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16½	<hr/> 17½

	Semester	
	1st	2nd
Sophomore Year.		
Modern Language or Approved Elective.....	3	3
General Physics (Phys. 1, 2)	3	3
School Management (Ind. Ped. 130)	3	
History of Education (Ind. Ped. 120)		3
Patternmaking, Foundry (Ind. Arts 135, 174)	3	3
Woodwork (Ind. Arts 113)	2	
Industrial Arts Design (Art 412).....	1	
Drawing (M. E. 156)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$

Junior Year.		
Modern Language or Approved Elective	3	3
General Psychology (Ind. Ped. 101)	3	
General Method (Ind. Ped. 140)		3
Forging (Ind. Arts 155)	2	
Hammered Metal Work (Ind. Arts 156)		2
Elementary House Planning (Arch. 701)	3	
Descriptive Geometry (M. E. 152)		3
Commercial Woods (For. 506)		2
Plumbing (Ind. Arts 270)	2	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Electives	2	2
	<hr/> 17	<hr/> 17

Senior Year.		
Special Methods (Ind. Ped. 170)		3
Machine Shop (Ind. Arts 208, 209)	2	2
Manual Training for Elementary Grades (Ind. Arts 231)		2
Machine Design (M. E. 205)	2	
Applied Mechanics Lab. (Exp. E. 207)	3	
Power and Hydraulics Lab. (Exp. E. 208)		3
Electrical Construction (Ind. Arts 250, 251)	2	2
Electives	7	4
	<hr/> 16	<hr/> 16

COURSE IN MECHANIC ARTS.

This is a vocational course extending through three years, during which the student devotes at least one-third of his time to shop-work and trade drawing. English, mathematics, chemistry, physics, and elementary economics are also included in order to balance the course and give it educational value.

The student is permitted to specialize in the vocational work according to his individual preferences and qualifications. The choice of work includes Cabinetmaking, Patternmaking, Machine Shop Work, *Electrical Construction, Plumbing, Blacksmithing, and Foundry Work.

This is not to be regarded as a preparatory course for the degree courses in engineering. Such preparation can best be obtained in the regular accredited high schools of the State. Neither is it intended that this course shall entice students away from the high schools, but that it shall fill a need not generally provided for by the secondary schools of the State.

It is the purpose of this course to assist those who expect to make their way in the world by their manual skill in various lines of activity—those who feel that they cannot afford to take a degree course in college, but desire to get some vocational training in special lines, and at the same time secure the broadening influence of education in English, mathematics, and elementary science. While it is not the primary aim to train foremen and superintendents, it is believed that students after completing the course and gaining a few years of practical experience will be able to hold positions of responsibility, or to go into business for themselves.

The shops are equipped with the latest approved machinery and are well suited to carry on these practical courses.

This work is open to students who have completed the eighth grade, or equivalent, of the common schools, and who are sixteen years of age. Those who complete the three years of work and take all of the work outlined will be entitled to a diploma. In order to secure a diploma in Patternmaking, Carpentry and Cabinetmaking, Machine Shop Practice, Electrical Construction, or Plumbing, at least two years must be devoted to the desired subject. The other year may be devoted to selected courses subject to the approval of the head of the department. A general shop course may be taken by combining one year of Machine Shop, one year of

*This course in Electrical Construction will not be given during the year 1915-16.

Blacksmithing, and one year of Foundry Work; or one year of Woodworking, one year of Foundry, and one year of Machine Shop.

Three-Years Course in Mechanic Arts.

	Semester	
	1st	2nd
First Year.		
Elementary Constructive English, Composition (Eng. A. B)	3	3
Algebra (Math. A. B)	5	5
History (Com. K)	2	2
Vocational Drawing (Ind. Arts A-1, B-1)	2	2
*Shop Work (According to trade selected)	4	4
Drill (Military A, B)	1	1
Gymnasium (Phys. Ed. 11, 12)	½	½
	17½	17½
Second Year.		
Advanced Composition and Literature (Eng. C. D)....	3	3
Shop Arithmetic (Math. O)	4	
Plane Geometry (Math. L)		4
Trade Drawing (Ind. Arts A-2, B-2)	2	2
Chemistry (Chem. A, B)	3	3
*Shop Work (According to trade selected)	4	4
Drill (Military C, D)	1	1
Gymnasium (Phys. Ed. 13, 14)	½	½
	17½	17½
Third Year.		
Geometry and Trigonometry (Math. T)	4	
Elementary Industrial Problems (Com. J)		3
Commercial Law (Com. L)	3	
Shop Accounting (Com. F)		2
Trade Drawing (Ind. Arts A-3, B-3)	2	2
Physics (Phys. A, B)	3	3
*Shop Work (According to trade selected)	4	4
Drill (Military E, F)	1	1
Electives		2
	17	17

*Shop Work. The student will choose the general line of shop work which he desires to pursue from the following: Cabinetmaking, Patternmaking, Machine Shop Work, Electrical Construction, Plumbing, Blacksmithing, and Foundry Work.

SCHOOL OF MINES.

The course in Mining Engineering is designed to give the student a thorough training in the essential fundamentals of the sciences of Mining and Metallurgy. The course is of such a comprehensive character, however, that a graduate may choose his life work from a varied assortment of employments. He may earn a good salary as an assayer and chemist; a land or deputy mineral surveyor; a draughtsman and designer in an engineering establishment; on the geological staffs of great railroad, mining, or exploration companies; in the land classification work of the Government Forest Service; in the Government Geological or Coast and Geodetic Surveys; in state geological surveys; in many branches of actual mining, milling, and smelting operations; or, when the requisite experience and standing have been secured, as an expert examining and consulting engineer. Scientific prospecting is also a very promising possibility.

In order to fill properly positions calling for such varied qualifications, a student's training must be unusually broad and thorough. Close application during student days and a willingness to work hard and faithfully are, then, essential prerequisites to success in mining engineering; but if the apprentice period is somewhat arduous, the work is of a very interesting nature, and the rewards, both in money and satisfaction, are unusually great.

DEGREE COURSE IN MINING ENGINEERING.

Freshman Year.	Semester	
	1st	2nd
Trigonometry, College Algebra (Math. 11, 21)	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem. 100, 101)	3	3
Mechanical Drawing (C. E. 107)	3	
Dynamic and Structural Geology (Geol. 153)	3	
Descriptive Geometry (M. E. 152)		3
Plane Surveying (C. E. 232)		4
Woodwork (Ind. Arts 105)	2	
Blacksmithing (Ind. Arts 152)		1
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	Semester	
	1st	2nd
Sophomore Year.		
Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Phys. 101, 102)	4	4
Qualitative Analysis (Chem. 301)	5	
Quantitative Analysis (Chem. 401)		5
Crystallography and Blowpipe Analysis (Geol. 111).....	3	
Determinative Mineralogy (Geol. 112)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	½	½
	17½	17½
Junior Year.		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Hydraulics (I. E. 102)		3
Electrical Machinery (E. E. 401)	3	
General Metallurgy (Chem. E. 411)	2½	
Historical Geology (Geol. 155)	1½	
Petrology (Geol. 131)		2
Fire Assaying (Chem. Eng. 401)	3	
Mine Surveying and Mining Law (Min. E. 212).....		3
Ore Dressing (Min. E. 251)		3
Drill (Military 5, 6)	1	1
Military Science (Theor. Inst. 1, 2)	1	1
	17	16
Senior Year.		
Metallurgical Laboratory (Chem. E. 423)	2	
Cyanidation of Ores (Chem. E. 421)	3	
Metallurgy of Lead and Copper (Chem. E. 412).....	3	
Design of Mine and Mill Structures (Min. E. 241)		3
Mining Methods (Min. E. 221)		3
Mining Geology (Geol. 181)	3	
Power Equipment (Min. E. 231)		3
Mine Economics (Min. E. 222)		3
Economic Geology (Geol. 182)		3
Mine Examinations and Reports (Min. E. 223)		1
General Engineering Laboratory (Exp. E. 210)	2	
Technical English (Eng. 141)	3	
	16	16

Note.—Practical Work. All students in the School of Mines are required to do at least two months' work in mines or industrial plants allied to the course chosen, or to take Geol. 190, before entering upon their senior year.

DEGREE COURSES IN CERAMICS.

Freshman and Sophomore years are identical with the freshman and sophomore years of the Degree Course in Mining Engineering.

	Semester	
	1st	2nd
Junior Year.		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Hydraulics (I. E. 102)		3
Electrical Machinery (E. E. 402)		4
General Metallurgy (Chem. E. 411)	2½	
Historical Geology (Geol. 155)	1½	
Petrology (Geol. 131)		2
Ceramic Chemistry (Cer. 301)	3	
Ceramic Raw Materials (Cer. 303)	3	
Raw Materials Testing (Cer. 310)		2
Ceramic Calculations (Cer. 312)		1
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	—	—
	17	17

Senior Year.

Technical English (Eng. 141)	3	
Power Equipment (Min. E. 231)		3
General Engineering Laboratory (Exp. E. 210)	2	
Principles of Economic Geology (Geol. 181)	3	
Manufacture of Clay Products (Cer. 321)	4	
Clay Products Laboratory (Cer. 322)		3
Limes and Cements (Cer. 326)		3
Glasses, Glazes, and Enamels (Cer. 323)	4	
Ceramic Laboratory (Cer. 324)		2
Field Work and Report (Cer. 328)		1
Thesis (Cer. 330)		2
	—	—
	16	16

(See note after Degree Course in Mining Engineering.)

DEGREE COURSE IN CHEMICAL ENGINEERING.

Freshman and sophomore years are identical with the freshman and sophomore years of the Degree Course in Mining Engineering.

	Semester	
	1st	2nd
Junior Year.		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Hydraulics (I. E. 102)		3
Electrical Machinery (E. E. 402)		4
Physical Chemistry (Chem. 410)	3	
Organic Chemistry (Chem. 201)	4	3
Thermochemistry (Chem. E. 452)		3
Chemical and Metallurgical Processes (Chem. E. 431)....	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	—	—
	17	18
Senior Year.		
Chemical Technology (Chem. E. 461, 462)	4	4
Electro-chemistry (Chem. 406)	3	
Electro-metallurgy (Chem. E. 442)		3
*Approved Electives	9	9
	—	—
	16	16

(See note after the Degree Course in Mining Engineering.)

*Elective courses may be chosen in the departments of Physics and Chemistry, and the Schools of Engineering, Forestry, and Mines, upon the approval of the Dean of the School of Mines and the heads of the other departments or schools concerned.

THE SCHOOL OF COMMERCE.

The School of Commerce offers two distinct courses of study; namely, (1) a four-years course leading to the degree of Bachelor of Science in Commerce; (2) a two-years vocational course leading to a Certificate of Business Proficiency. The practical side of every subject is especially emphasized, the constant aim being to train the student for service and efficiency.

THE VOCATIONAL COURSE.

This course has been arranged primarily for the benefit of persons who have been unable to finish a high school course. The only entrance requirements are that the applicant must have had an eighth grade education, or its equivalent, and must be at least eighteen years of age. The student may emphasize bookkeeping and business methods, or stenography and typewriting; or he may have an opportunity to take both courses.

THE DEGREE COURSE.

In the degree course all freshmen follow the same schedule; in the sophomore year, however, the student may choose as a major either accounting or secretarial studies, the latter including stenography and office practice. In the junior year, the student may further select a major course from one of the following: (1) Business Administration, (2) Economics, (3) Political Science and History, (4) Secretarial Studies. Instead of the above options, a liberal range of general electives is offered so that in the junior or senior year, the men may elect courses in Agriculture, Forestry, or Industrial Arts, while the women may elect courses in Home Economics.

DEPARTMENTS.

For administrative purposes, the School of Commerce is organized into four distinct departments: (1) Business Administration, (2) Economics, (3) Political Science, and (4) Stenography and Office Training.

BUSINESS ADMINISTRATION.

The distinctive work of the department of Business Administration in the School of Commerce is to train men and women for ef-

ficient business management. This includes thorough courses in the various phases of Accounting, Auditing, Business Organization, Scientific Management, Advertising, and Salesmanship.

While the courses in Business Administration are primarily designed to fit students for the countinghouse and business office, including banking, it is found that such positions are generally only stepping stones to more advanced positions of trust and responsibility. A large percentage of the commercial students eventually engage in business of their own.

The School of Commerce has taken a leading part in developing courses in business methods especially adapted to the farm, the home, and cooperative enterprises. Such courses are given not only in residence but also by correspondence.

When it is remembered that every vocation has its business side, and that this phase of all pursuits is receiving increasing attention, it is apparent that the avenues of employment and the chances for promotion by the really competent business expert are almost unlimited. As a preparation for law or public accounting, this course, combined with economics and political science, is especially attractive. A large percentage of the graduates in commerce find employment as teachers of commercial subjects in state and private schools; to them the courses in business administration are very important.

ECONOMICS.

The work of this department serves a three-fold purpose:

(1) **The training of men and women for citizenship.** Every citizen has business relations requiring a knowledge of the fundamental principles of political economy. The necessity of such knowledge is especially felt in a democracy where every man and woman has the right to vote, and is called upon to mold legislation directly. The basis for intelligently exercising this paramount duty of citizenship can only be supplied by a training in economics and sociology, the problems of which form the subject matter of all legislation.

(2) **To provide courses supplementary to the various branches of applied science.** To the agricultural college belongs the special task of developing the field of Agricultural Economics and Rural Sociology. It is the aim of this department to provide the necessary training for teachers in these subjects, to prepare specialists

for research work in economic and social surveys of rural communities, and to equip those who will make a life work of organizing farmers' associations for the more economical conduct of the business side of farming.

POLITICAL SCIENCE.

The commercial work of the department of Political Science trains in the elements of business law, and prepares the student for ordinary business transactions. Politically, the department instructs in the composition and operation of our government, its relations with other nations, and indicates the need and field for individual participation in governmental affairs.

STENOGRAPHY AND OFFICE TRAINING.

The courses offered by the department of Stenography and Office Training are for four classes of students: (a) those desiring a thorough training as stenographers and typists; (b) those desiring to go still further into the field of court reporting and secretarial training; (c) those desiring to enter the teaching profession; and (d) those commercial teachers desiring advanced training.

The ground covered by the special subjects offered by this department is as follows: Stenography and Typewriting, two years; Court Reporting, one year; Secretarial Training, one year; and Method of Teaching Commerce, one year.

THE BUREAU OF ORGANIZATION AND MARKETS.

At its meeting October 9, 1914, the Board of Regents took action establishing a Bureau of Organization and Markets in the Department of Economics. Its functions and activities were outlined as follows:

1. Cooperation with all existing farmers' organizations to secure greater efficiency in marketing and in social service.
2. Assistance to farmers in the formation of economic organizations suitable to meet the needs of marketing and the supply of farm necessities. This assistance to be given through:
 - (a) Expert advice as to the kind of association needed, based upon a careful survey of the district in which it is proposed.
 - (b) Assistance from an expert in getting organized.
 - (c) Guidance in establishing an accounting system.

(d) A system of audit and advice by means of monthly statements furnished the Bureau.

(e) Extension lectures before the membership of the Association.

3. The coordination of the various organizations of the State so as to secure the maximum amount of assistance from the use of the Parcel Post.

(a) The Bureau itself will act as a clearing house for organizations within the State.

(b) Each County Agriculturist will act as a clearing house for the individual farmers of his county.

4. There will be collected at the College in the Office of the Bureau, a file of all the laws obtainable relative to marketing, cooperation, and agriculture in general. Through this information, the College will be in a position to cooperate effectively with the legislative committees of the farmers' organizations in securing the best laws for the State.

5. There will also be collected and filed blue prints of typical plants such as creameries, cheese factories, canneries, dryers, flour and feed mills, etc., with catalogs of all firms dealing in supplies for such plants. From this information can be supplied estimates as to the cost of building and equipping plants for various associations.

6. The Bureau will work toward a coordinated system of surveys of the State which will supply accurate data regarding commodities produced and the systems of marketing for each locality.

7. Through bulletins, press notices, and Extension lectures, the Bureau contemplates a systematic publicity campaign on the whole subject of marketing, including the functions of organization, standardization of products, packing, shipping, etc.

The work of the Bureau is now under way and will be pushed as rapidly as the demand for organization and the available funds will permit.

TWO-YEARS BUSINESS COURSE IN COMMERCE.

	Semester	
	1st	2nd
First Year.		
Elementary Constructive English (Eng. A, B)	3	3
U. S. History (Hist. D)	3	
Civics (Com. N)		3
Stenography (Com. 400, 401) or	4	4
Office Training and Typewriting (Com. R, S)....	(2)	(2)
Penmanship (Com. U, V)	(2)	(2)
Commercial Arithmetic (Math. M, N)	3	3
Bookkeeping (Com. B, C)	3	3
Gymnasium (Phys. Ed. 11, 12)	1½	1½
Drill (Military A, B)	1	1
	<hr/>	<hr/>
	17½	17½
Second Year.		
Advanced Composition and Literature (Eng. C, D) or....	3	3
Stenography (Com. 402, 403)	(4)	(4)
Business English (Eng. M)	3	
Accounting (Com. 100, 101)	3	4
Commercial Geography (Com. 200)	3	
History of Commerce (Com. 205)		3
Commercial Law (Com. L)	3	
Elementary Industrial Problems (Com. J)		3
Technical English (Eng. N)		3
Penmanship (Com. W, X)	1	1
Gymnasium (Phys. Ed. 13, 14)	1½	2
Drill (Military C, D)	1	1
	<hr/>	<hr/>
	17½	18½

First Year, Second Semester Registration.

Elementary Constructive English Composition (Eng. B)	3
Bookkeeping (Com. B.)	3
History of Commerce (Com. 205)	3
Civics (Com. N)	3
Penmanship (Com. V)	2
Typewriting (Com. 411) or	2
Stenography (Com. 400)	(4)
Gymnasium (Phys. Ed. 12)	$\frac{1}{2}$
Drill (Military B)	1
	<hr/>
	17 $\frac{1}{2}$

DEGREE COURSE IN COMMERCE.

	Semester	
	1st	2nd
Freshman Year.		
Accounting (Com. 100, 101)	3	4
Stenography (Com. 400, 401)*	4	4
Business English (Eng. 141)	3	
Technical Business English (Eng. 142)		3
Commercial Geography (Com. 200)	3	
History of Commerce (Com. 205)		3
Advanced Commercial Arithmetic (Math. 10)	3	
Contemporary American History (Hist. 62)		3
Library Practice (Lib. 1)	$\frac{1}{2}$	
Hygiene (Ph. Ed. 10)	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4)	1	1
	<hr/>	<hr/>
	18 $\frac{1}{2}$	18 $\frac{1}{2}$

*Or Science, See requirements for Graduation.

	Semester	
	1st	2nd
Sophomore Year.		
Modern English Prose (Eng. 81, 82) or French, German or Spanish*	3	3
Economic History of The United States (Com. 206).....	3	
Principles of Economics (Com. 210)		3
Advanced Commercial Law (Com. 300, 301)	3	3
Accounting (Com. 102, 103) or Stenography (Com. 402, 403)	4	4
Modern European History (Hist. 40)		3
History of Oregon (Hist. 70)	3	
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4)	1	1
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Junior Year.

Money and Banking (Com. 230)	3	
Labor Problems (Com. 213)		3
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Business Organization and Management (Com. 110)	3	
Advertising and Selling (Com. 112)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Practical Sociology (Com. 250) or History of Educa- tion (Ind. Educ. 120)		3
Electives (6-3) (See groups)	6	3
	<hr/> 17	<hr/> 17

Senior Year.

Public Finance (Com. 233)	3	
Transportation (Com. 240)		3
Comparative Study of Governments (Com. 325)		3
International Relations (Com. 302)	3	
Electives (See groups) (10-10)	10	10
	<hr/> 16	<hr/> 16

*If Modern Language is elected, it must be continued in the Junior year.

Freshman Year, Second Semester Registration.

Accounting (Com. 100)	3
Modern English Prose (Eng. 82)	3
Advanced Business English (Eng. 142)	3
Principles of Economics (Com. 210)	3
History of Commerce (Com. 205)	3
Typewriting (Com. 411) or	2
Stenography (Com. 400)	(4)
Gymnasium (Phys. Ed. 16)	$\frac{1}{2}$
Drill (Military 4)	1
	<hr/>

18½

Note: Six credits in sciences are required for graduation as follows:
Chemistry 100, 101, Physics 1, 2, Bact. 101, Zoology 204; or Botany 20.

SUGGESTED ELECTIVE GROUPS.

While the student may choose other subjects than those enumerated below, he is strongly urged to adopt one of the suggested groups.

Group 1. Business Administration.

	Semester	
Junior Year.	1st	2nd
Commercial Pharmacy (Phar. 160, 161)	3	3
Practical Public Speaking (Eng. 105, 106)	3	3
National Vitality (Com. 254)	1	
Journalism (Eng. 301)	1	
Bibliography (Com. 414)		1
	<hr/>	<hr/>
	8	7

Senior Year.

Accountancy Problems (Com. 105)	3	
Public Accounting and Auditing (Com. 106)		3
General Psychology (Ind. Educ. 101)	3	
History of Education (Ind. Educ. 120)		3
Economic Organization of Agriculture (Com. 264)	3	
Insurance (Com. 235)		3
Thesis (Com. 111)	1	1
	<hr/>	<hr/>
	10	10

Group 2. Economics and Sociology.

Semester

Junior Year.

1st 2nd

American Literature (Eng. 71, 72) or 3 3

Modern Language*

Cooperation (Com. 260) 3

Science 3

National Vitality (Com. 254) 1

Bibliography (Com. 414) 1

— —

7 7

Senior Year.

Accountancy Problems (Com. 105)** 3

Public Accounting and Auditing (Com. 106)** 3

Insurance (Com. 235) 3

Practical Public Speaking (Eng. 105) 3

General Psychology (Ind. Educ. 101) 3

History of Education (Ind. Educ. 120) 3

Thesis (Com. 111) 1 1

— —

10 10

Group 3. Political Science.**Junior Year.**

History of English Literature (Eng. 61, 62) 3 3

Economic Organization of Agriculture (Com. 264) 3

Insurance (Com. 235) 3

National Vitality (Com. 254) 1

Bibliography (Com. 414) 1

Senior Year.

Advanced American Government (Com. 304) 3

Practical Legislation (Com. 328) 3

History of the British Empire (Hist. 52) 3

American Diplomatic History (Hist. 80) 3

Accountancy Problems (Com. 105) 3

Public Accounting and Auditing (Com. 106) 3

Journalism (Eng. 301) 1

— —

10 9

*If the first year modern language is elected, it must be continued in the senior year.

**Given on alternate years, beginning 1915-16.

Group 4. Office Training and Teachers' Course. Semester

Junior Year.	1st	2nd
Stenography (Com. 402, 403)	4	4
Office Training for Stenographers (Com. 412)	2	
Secretarial Training for Stenographers (Com. 413).....		2
National Vitality (Com. 254)	1	
Bibliography (Com. 414)		1
	<hr/> 7	<hr/> 7

Senior Year.

Special Methods (Ind. Educ. 180, 181) or Expert Speed Course (Com. 404, 405)	2	2
General Methods (Ind. Educ. 140)	3	
Business Organization and Management (Com. 110).....	3	
History of Education (Ind. Educ. 120) or Mechanical Drawing (M. E. 156)		3
Labor Problems (Com. 213)		3
Public Speaking (Eng. 103, 104 or 201, 202)	2	2
	<hr/>	<hr/>
or		
Manual Training for Teachers (Ind. Arts 103, 104).....	3	3
Mechanical Drawing and Lettering (M. E. 156)		3
Physical Education, Normal Course (Phys. Ed.)	2	2
Approved Electives	5	2
	<hr/> 10	<hr/> 10

Group 5. Agriculture.**Semester****Junior Year.****1st.****2nd**

Soils (Agron. 101)	3	
Crops (Agron. 201)		3
Approved Electives	4	4
	—	—
	7	7

Senior Year.

Stock Judging (An. Husb. 1)	2	
Live Stock Managing (An. Husb. 2)		3
Plant Propagation (Hort. 105)		2
Orchard and Garden Practice (Hort. 103)	2	
Approved Electives	6	5
	—	—
	10	10

Group 6. Home Economics.**Junior Year.**

Food Preparation (D. S. 101)	3	
Food Preparation (D. S. 102)		3
Approved Electives	4	4
	—	—
	7	7

Senior Year.

Dressmaking (D. A. 201)	3	
Dressmaking (D. A. 202)		3
Approved Electives	7	7
	—	—
	10	10

Note.—If the student has not already six college credits in Science he should register according to Note concerning requirement for graduation, page 158, in the Junior or Senior year.

DEPARTMENT OF PHARMACY.

Success in Pharmacy depends to a great extent on what preparation one makes for his work in the formation of correct habits of economy coupled with industry. The importance of a scientific training in pharmacy cannot be overestimated. This is true both as regards the pharmacist and the public, for the dispenser of medicines must be held responsible for the purity and strength of his preparations. The necessary education for conducting a modern pharmacy cannot be secured in a drug store alone, however valuable the experience gained therein may be. It is clearly evident that suitable preparation for the life-work of the practical pharmacist can only be given to one who has the necessary practical experience, as well as the proper educational training.

State boards of pharmacy, recognizing the importance of scientific pharmaceutical training, are requiring it in addition to a definite amount of practical drug-store experience as a prerequisite for registration. The Oregon State Board of Pharmacy requires that after January 1, 1916, all applicants for examination as a registered pharmacist or assistant pharmacist must have had a year's work of college grade in a school of pharmacy that meets the requirements of the American Conference of Pharmaceutical Faculties. After January 1, 1917, this board requires that the applicant for examination must be a graduate in Pharmacy.

Of late years the demand for educated pharmacists has been more urgent than ever before, on account of the enactment of State and National Pure Food and Drug Laws, as well as other laws that regulate the sale of medicinal substances. For these reasons, it is necessary that pharmacists adjust themselves to public sentiment, which expects pure drugs and medicines and competent persons to manufacture and dispense them. These requirements can only be attained through pharmaceutical education.

The necessary knowledge of the sciences on which the art of pharmacy is based and the technical skill required to practice that art, are best acquired in a well-equipped school of pharmacy. From the fact that very little teaching is done in drug stores, it becomes necessary for the successful pharmacist to have college training in order accurately to prepare medicines and dispense prescriptions. Aside from this, it often becomes necessary to

identify drugs, detect accidental poisoning and to determine whether drugs are fit to be used in prescription work.

It is this kind of training that the Department of Pharmacy at the Oregon Agricultural College is prepared to give. The department is conveniently located in Science Hall and the eight rooms that are used for instruction in the strictly pharmacy subjects are very well equipped to give the proper instruction. The courses in pharmaceutical chemistry are given by the department of Chemistry which is also located in Science Hall.

One of the main objects of all young pharmacists is to pass a creditable examination before the State Board of Pharmacy. Preparation for such examinations is a special feature of the work of the department and its graduates have been most successful. Aside from enabling students to pass the pharmacy examination, however, the aim of the department is to afford an opportunity to obtain a thorough technical training that will equip the student for a life of efficient service in the profession of pharmacy from the practical point of view.

The courses of study meet the highest requirements of pharmaceutical instruction. The facilities for work are such that students who are interested can become most proficient in the manufacture and dispensing of drugs. The time spent in scientific pharmaceutical training will result beneficially for the people and to the profession of medicine in which pharmacy occupies a separate and distinct field.

Since the pharmacy curriculum requires more chemistry than any other course in the College, it is possible for students in pharmacy and special students to major in chemistry by electing the course in preparation for any position they have in mind. Graduates are constantly being sought by retail pharmacists as prescription dispensers, by manufacturing and wholesale druggists, by Federal and State Pure Food and Drug Laws, where they serve as chemists and inspectors.

Oregon is especially adapted to the cultivation of medicinal plants and it is only a question of time when the growing of drugs will prove to be a commercial enterprise for the State. The department of Pharmacy is especially fortunate in being able to give instruction along the line of drug cultivation. This is one of the features of the course in Pharmacognosy, a course in which stu-

dents are taught to identify, cultivate, preserve, and understand all vegetable drugs.

A two-years course leading to the degree of Graduate in Pharmacy (Ph. G.) is offered, comprising the more professional studies of the curriculum. It prepares directly for drug-store and dispensing practice and provides a groundwork in analytical chemistry necessary for the drug business and the various phases of pharmaceutical manufacturing.

A four-years course is academic and professional, leading to the degree of Bachelor of Science (B. S.) This is the most satisfactory course to elect, because it gives a broad collegiate training supplemented with the professional work of the two-years course. This course also includes thorough work in Bacteriology, Zoology, Botany, Food and Drug Chemistry, and Physiological Chemistry. Many students who have completed the work of this degree have continued their study in Schools of Medicine.

The entrance requirements for the above courses are the same as for other degree courses of the College. Students who have had advanced training, however, and who wish to elect special work in Pharmacy and Chemistry, may register as special students.

DEGREE COURSE IN PHARMACY.

Freshman Year.	Semester	
	1st	2nd
Modern English Prose (Eng 81, 82)	3	3
General Chemistry (Chem. 105, 106)	5	2
Qualitative Analysis (Chem. 300)		3
General Zoology (Zool. 101, 102)	3	3
Pharmaceutical Botany (Bot. 70,71)	3	4
Elementary Pharmacy (Phar. 102, 103)	1	1
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	½	½
Library Practice (Libr. 1)	½	
Hygiene (Phys. Ed. 10)	½	
	<hr/> 17½	<hr/> 17½

	Semester	
	1st	2nd
Sophomore Year.		
Organic Chemistry (Chem. 200, 201)	3	3
Quantitative Analysis (Chem. 400)	4	
Zoology (Zool. 201, 202)	3	3
Pharmaceutical Latin (Phar. 104)	2	
Modern Language (French, German or Spanish).....	3	3
Principles of Economics (Com. 210)		3
Commercial Law (Com. 306)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	16 $\frac{1}{2}$	16 $\frac{1}{2}$

Junior Year.

Theoretical Pharmacy (Phar. 116)	3	
Bacteriology (Bact. 201, 202)	3	3
Modern Language	3	3
Practical Pharmacy (Phar. 117)		3
Pharmaceutical Preparations (Phar. 118)		2
Pharmacognosy (Phar. 130, 131)	3	2
Inorganic Pharmacy (Phar. 121)	3	
Alkaloidal Testing, Drug Assaying (Chem. 404, 405).....	2	2
Pharmaceutical Calculations (Phar. 123)		2
Drill (Military 5, 6)	1	1
	<hr/>	<hr/>
	18	18

Senior Year.

Composition of Addresses (Eng. 103, 104)	2	2
Materia Medica and Toxicology (Phar. 140, 141)	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115)	3	3
Food and Drug Analysis (Chem. 304)	3	
Prescription Lectures (Phar. 150)	3	
Prescription Incompatibilities (Phar. 151)		3
Prescription Compounding (Phar. 152).....		2
Manufacturing Pharmacy (Phar. 170)	2	
Physiological Chemistry (Chem. 409)		3
	<hr/>	<hr/>
	16	16

TWO-YEARS COURSE IN PHARMACY.

	Semester	
	1st	2nd
First Year.		
General Chemistry (Chem. 105, 106)	5	2
Qualitative Analysis (Chem. 300)		3
Pharmaceutical Latin (Phar. 104)	2	
Inorganic Pharmacy (Phar. 121)	3	
Pharmacognosy (Phar. 130, 131)	3	2
Theoretical Pharmacy (Phar. 116)	3	
Practical Pharmacy (Phar. 117)		3
Pharmaceutical Preparations (Phar. 118)		2
Pharmaceutical Calculations (Phar. 123)		2
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Elective		2
	<hr/>	<hr/>
	17½	17½

Second Year.

Organic Chemistry (Chem. 200, 201)	3	3
Materia Medica and Toxicology (Phar. 140, 141)	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115)	3	3
Prescription Lectures (Phar. 150)	3	
Prescription Incompatibilities (Phar. 151)		3
Prescription Compounding (Phar. 152)		2
Manufacturing Pharmacy (Phar. 170)	2	
Alkaloidal Testing (Chem. 404)	2	
Drill (Military 3, 4)	1	1
Electives		2
	<hr/>	<hr/>
	17	17

DEPARTMENTS OF INSTRUCTION.

SCHOOL OF AGRICULTURE.

AGRONOMY

PROFESSOR SCUDDER
ASSOCIATE PROFESSOR HYSLOP
ASSISTANT PROFESSOR POWERS
ASSISTANT PROFESSOR RUZEK
ASSISTANT PROFESSOR LARSON
MR. BRACKER
MR. COOTER
MR. CARNES
MR. SCHOTH

Agronomy is the science of the fields and the crops of the fields. Instruction in this science is offered by the department of Agronomy in the following subjects:

- (a) Soils: Their origin, structure, fertility, cultivation, and improvement.
- (b) Field Crops: Their history, growth, culture, improvement, and value.
- (c) Irrigation and Drainage: The principles and methods of land drainage; the handling of land under irrigation.
- (d) Farm Mechanics: The structures and machinery of the farm.
- (e) Farm Management: Practical methods and systems for the operation of the farm under different conditions as a permanent money-making business.

In every subject, instruction is accomplished equally through class room, laboratory, and field work; theory is checked by practice. For the latter methods of instruction, the well-equipped laboratories of this department, the various soil conditions, numerous experimental crops, and extensive structures of the Experiment Station farms, offer excellent facilities. The large and newly equipped laboratories for the courses in Field Crops and the courses in Soils, in the Agronomy building, and for Farm Mechanics in the Farm Mechanics building, are not excelled by those of any institution in the west.

The one-year courses in Agronomy deal with the practical application of the underlying principles of agriculture to specific conditions—aiming to give the less prepared student as much infor-

mation as possible in a short time concerning those practices most vital to successful farming—to send him back to the farm better prepared to cope with its problems.

The object of the collegiate courses in this department is to give the student such mastery of all the subjects relating to the soil, field crops, rural engineering, or farm management, as will help prepare him for the highest type of practical farming or farm management; or for a successful career in professional agriculture, such as is found in the U. S. Department of Agriculture, in the State Experiment Stations and Agricultural Colleges, or in Agricultural Extension work.

The farms of the Northwest offer even greater opportunities for men trained in knowledge of the soil, in the growing of crops, in irrigation and dry farming, and in farm management.

Agronomy 101 and 201 are prescribed for all collegiate agricultural students. The succeeding courses are the majors and minors offered to all upper classmen in Agriculture.

Those who elect Agronomy for their major work, may take any one of the following courses:

- (a) General Agronomy.
- (b) Soils.
- (c) Field Crops.
- (d) Irrigation Farming.
- (e) Farm Management.

Students majoring in Agronomy should confer with the head of the department to arrange for taking any one of the specialized courses named. Liberal elections in other departments are permitted wherever advisable.

ONE-YEAR COURSES.

A. Farm Soils. A brief history of the origin of soils; the fertility of soils; the most valuable chemical constituents; their exhaustion and replenishment; the most important physical factors; their deterioration or improvement. The physical components; their relative value and amounts in soil mixtures. Practice in judging the chief soil types of Oregon. The effects upon soils of tillage, manuring, crop rotation, drainage, and irrigation.

One-year course; first semester; 3 credits; 2 recitations; 1 laboratory period.

B. Farm Crops. A brief consideration of the adaptability, relative value, and best methods of growing the chief cereal crops, grass, legume, and succulent crops of Oregon for grain, pasture, meadow, soiling, silage, or seed purposes. Investigation of the sources of crop seed and the importance of seed purity and germinating power, with methods of testing seeds. Eradication of the most common weed enemies of field crops.

One-year course; second semester; 3 credits; 2 recitations; 1 laboratory period.

C. Farm Machines and Engines. A general course in Farm Mechanics. The more important field machines and gasoline engines are studied. Farm buildings, concrete work, rope work, etc., are also given attention.

One-year course; first semester; 3 credits; 1 recitation; 2 laboratory periods.

D. Practical Farm Drainage. The value of drainage, and the methods and cost of installing drainage systems under different soil and land conditions, district drainage, etc.

Elective in one-year course; second semester; 2 credits; 1 recitation; 1 laboratory period.

E. Dry Farming Practices. Soil and climate conditions, and tillage and cropping methods as affecting successful dry farming practices.

Elective in one-year course; first semester; 2 credits; 2 recitations.

F. Irrigation Farming Practices. The most effective methods of handling irrigation waters and the different crops under irrigation, and the cost and profits thereof. Organization as affecting water use and control in irrigated districts.

One-year course; second semester; 2 credits; 2 recitations.

G. Practical Farm Management. The chief factors bearing on successful farming, such as the type of farming, factors of size, use of capital, handling of labor, proper equipment, cropping systems, marketing, etc., are given consideration from the practical standpoint.

One-year course; second semester; 2 credits; 2 recitations.

DEGREE COURSES.

SOILS.

101. Soils. Fundamental facts concerning the origin and formation of soils; soil moisture, heat and air; common soil processes, physical and chemical; plant foods and soil fertility; tillage, crop rotation, and manuring; the more important effects of bacteria on soil fertility; the benefits derived from drainage and irrigation; common farm machines, their use and care. The course will close with a brief survey of the agriculture of the State. Instruction will be given through lectures and notes, text and recitation, laboratory, and field observations.

Freshman year; first semester; 3 credits; 2 recitations; 1 laboratory period.

102. Soil Physics. Advanced study of the geology of soils, with their origin, formation, physical composition, and classification. Soil moisture and moisture movements and conservation. The various physical processes of the soil—surface, tension, osmosis, capillarity, diffusion, etc. The effects of the various crops and the different methods of culture upon the texture, aeration, temperature, and moisture of the soil, and the resulting alteration in crop producing power. The influence of washing, drainage, and irrigation upon soils. Work in the laboratory will consist of the determination and comparison of such physical properties in the various soil types as, specific gravity, water retention, capillarity, organic content, etc.; the physical effect of mulches, rotations, and cropping; soil sampling and judging; the mechanical analysis of soils.

Elective; junior year; second semester; 4 credits; 2 recitations; two laboratory periods.

103. Soil Physics. Elective. Similar to 102, but shorter, dealing with the more important phases of the subject. Designed as an elective for agricultural students unable to take the regular course in Soil Physics, and for students in Irrigation Engineering.

Elective; junior year; either semester; 3 credits; 2 recitations; 1 laboratory period.

104. Soil Fertility. The effect of the various crops upon the fertility of the soil. The maintenance or improvement of fertility by the use of fertilizers and manures. The composition and value of the different fertilizers and manures. The effect of different

rotations upon fertility. The fertility of the different types of Oregon soils; their plant food requirements and comparative values; methods of improvement of each. The effects of different systems of farming. Analysis, field plot, and pot culture investigations. Where necessary, the laboratory work may be omitted and the lecture work only, taken. (See Agron. 107.)

Prerequisite: Agronomy 102.

Elective; senior year; first semester; 4 credits; 3 recitations; 1 laboratory period.

105. Dry Farming Tillage. One of the special courses given in Dry Farming, others of which are described under the Field Crops section as Semi-Arid Crop Production, and under the Farm Management section as Semi-Arid Farm Management. This course takes up the advanced study of the subject of moisture conservation, special tillage methods and machinery, soil and climatic conditions, etc., in dry farming regions, with particular reference to Oregon and the Northwestern states.

Prerequisite: Agronomy 102 or 103.

Elective; junior or senior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

106. Soil Surveying. For the advanced student who wishes to specialize in soils for service in the state experiment stations or the Government Bureau of Soils. The course includes some advanced study of the classification of soils and soil areas of the United States, of Oregon, and of the Northwest, but most of the time is devoted to work in the field, making regular and completed soil surveys of assigned areas, with a report thereon.

Prerequisite: Agronomy 102 or 103.

Elective; senior year; second semester; 2 credits; 2 laboratory periods.

107. Soil Fertility. Same as Agron. 104 except no laboratory work.

Prerequisite: Agronomy 102.

Elective; senior year; first semester; 3 credits; 3 recitations.

111. Advanced Soil Work. The advanced student specializing in soils may study the various soil types of Oregon through mechanical analysis, and other physical tests; may undertake field work in soil surveying and mapping; or, through wire basket, pot culture, and field plot tests, may determine the effects of various

systems of cropping, or fertilizing, or of soil bacteria, upon soil fertility.

Prerequisites: Agronomy 102 and 104.

Elective; senior or graduate year; either semester or both; 2 to 5 credits.

Field Crops.

201. Crop Production. The study of the chief field-crop seeds of Oregon; wheat, barley, oats, corn, vetch, clover, alfalfa, grasses, etc., their vitality, germination, preservation, growth and reproduction; preliminary judging; seed bed and seeding; climate and soil; culture and rotation; weed enemies, their prevention and eradication; harvesting, marketing, and profits; distribution and value to the State; methods of crop improvement. Class room, laboratory, and field work.

The course in Agriculture; freshman year; second semester; 3 credits; 2 recitations; 1 laboratory period.

202. Cereal Crops. A study of grains with special reference to those of Oregon, and the varying conditions of soil and climate under which they are grown; the culture and rotation best adapted to each; the various methods of harvesting and storage; the judging of grain; grading for market; markets and uses of each crop; improvement of crop seed.

Junior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

203. Forage Crops. A study of legumes, grasses, and succulent crops adapted to the work of Agronomy, Animal and Dairy Husbandry students. Temporary pasturing systems; seeding, care and maintenance of permanent pasture: reseeding and care of range. Adaptability, culture, methods of handling, and value of various crops for forage. Silage and hay making. Soiling crop rotations. Storage and marketing.

Elective; junior year; first semester; 2 credits; 2 recitations.

204. Crop Improvement. A course dealing with the practical problems in the improvement of the quality and yield of the more important field crops, a knowledge of which would be necessary for the successful Oregon crop growers, especially those engaged in seed production. The different systems of breeding and the general principles of selection will be briefly discussed, and the

best planting and cultural methods for the breeding plots studied. The work will be largely in the laboratory and field.

Junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

205. Agrostology. A study of the grasses, legumes, and other forage and seed crops. Methods of seeding, production, harvesting, and marketing of meadow, pasture, cover, and special crops for seed, fiber and special purposes other than forage. The comparative structure and identification of the different forage plants, their adaptability to different conditions of soil and climate. Examinations of commercial seed for viability and purity. The identification of weed seed. The production of forage crop seed.

Elective; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

206. Advanced Crop Breeding. A study of the laws, theories, and known facts concerning heredity, variation, and evolution in plant life. The causes of variation, behavior of characters in transmission, and the possibilities of inducing stability of character and establishing desirable types, will be discussed with special reference to field-crop improvement.

Prerequisite: Agronomy 204.

Senior year; second semester; 2 credits; 2 recitations.

207. Semi-Arid Crop Production. A course for students making a special study of Dry Farming or Irrigation Farming. Advanced work with the grain and forage crops adapted to the semi-arid regions of the United States, and the Northwest in particular. The course embraces the special methods of seeding, cultivating, and harvesting; comparison of water requirements, drouth and alkali resistance; special methods of seed production and plant breeding, etc., as applied to semi-arid production.

Prerequisite: Agronomy 202 and 205.

Elective; senior year; second semester; 1 credit; 1 recitation.

208. Seed Testing. A course for students preparing themselves for positions as seed experts in Government, State, or commercial seed testing laboratories. The work accomplished by seed testing laboratories; the various methods and apparatus employed; details and operations of the pure seed laws of the different states. Most of the time of the student, however, is devoted to actual seed testing work, following the regulation Government methods and using the regulation equipment, forms, etc. Students expecting

to take this course should consult with the department of Agronomy at the beginning of their junior year, so that certain preparatory work in Agronomy and Botany may be taken prior to the course in Seed Testing.

Prerequisite: Courses in Agronomy and Botany during junior year, to be arranged by consultation.

Elective; senior year; first semester; 2 credits; 2 laboratory periods.

209. Advanced Seed Testing. A continuation of the preceding course, consisting largely of actual work required in the Seed Testing laboratory to qualify the student for successful work as a seed expert.

Prerequisite: Courses in Agronomy and Botany during junior year, to be arranged by consultation.

Elective; senior year; second semester; 2 credits; 2 laboratory periods.

210. Potato Growing. Complete discussion of the potato crop in this country and abroad. The literature of this interesting subject is fully covered. Especial study is given to varieties, growing methods, harvesting, storing, marketing, and manufacturing, of the Oregon and Northwest potato crop. Seed selection, potato exhibiting and scoring, and potato statistics are given attention.

Elective; senior or graduate year; first semester; 1 credit; 1 recitation.

211 Advanced Crop Work. In this subject, a complete study may be made of some special crop in which the student is interested, or on which information is lacking. Methods of field experimentation may be compared and carried out; or plant breeding theories and their practical use in commercial seed production may be made the subject of investigation, or preparation for expert seed testing taken up.

Aside from these phases of advanced crop study, special one-hour lecture courses are offered (to groups of not less than five students) in each of the following specific subjects: Sugar Beets; Hops; Legume Seed Production.

Elective; senior or graduate year; first or second semester or both; 1 to 5 credits.

Drainage and Irrigation.

301. Land Drainage. The history of drainage; road, field, and sanitary drainage on the farm; the different systems of drainage; methods of locating, installing, operating, and maintaining drainage conduits; cost, efficiency, and profits; the effect on crops and soil; laws governing. Lectures, notes, readings, and field work.

Elective; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

302. Irrigation Farming. Methods of obtaining, distributing, and conserving irrigation waters. Handling of different crops under irrigation. Cost and profits thereof, and duty of water in various districts of Oregon. Water rights and irrigation codes. Field and laboratory studies of irrigable quantities of different soils, laying out of irrigation systems, and field examinations, where possible, of some of the largest projects in the State.

Prerequisites: Agronomy 102 and C. E. 242 and 243.

Elective; junior or senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

303. Climatology. Practical meterology; observing and recording local weather and forecasting; a study of the climate of Oregon and the effect of climate upon agriculture. Class room and laboratory work.

Elective; junior or senior year; second semester; 1 credit; 1 laboratory period.

304. Advanced Land Drainage. A study of drainage problems and conditions in the field. The actual surveying, laying out, draughting of plans, estimation of cost, and installation of drainage systems at different points in the State, is required of students taking this course. A complete report of the organization of a drainage district is prepared by each class.

Prerequisites: Agronomy 301 and 102, and C. E. 242 and 243.

Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

305. Irrigation Institutions. A brief history of the development of water laws. Riparian rights and irrigation codes in the different states, particularly in the Northwest and Oregon. Reclamation and other Government and State land acts affecting irriga-

tion development. Organization and administration of irrigation districts and projects; of water users' associations, etc.

Elective; senior year; first semester; 2 credits; 2 recitations.

306. Irrigation Farming Elective. Special course for Irrigation Engineering students or other students who cannot take the regular course in Irrigation Farming the first semester. This course deals with the handling of irrigation water after it reaches the farm, and of the different crops under irrigation. The irrigable quality of different soils, the duty of water in various districts of Oregon, and water rights and irrigation codes from the standpoint of the farmer, are important features of the course.

Elective; junior or senior year; second semester; 2 credits; 2 recitations.

311. Advanced Drainage or Irrigation Work. Under this head the student who has completed the courses offered may take up further study of special problems in either subject, such as the drainage of alkali lands, drainage against seepage, study of water table fluctuations, etc.; or field studies of the irrigation of a certain crop region, conservation of irrigation waters, effect of irrigation on soil moisture conditions, etc. Such field practice studies should, as far as possible, be undertaken during the summer vacation in the junior year, arrangement being made beforehand with the instructor, so that data might be accumulated for senior thesis work.

Prerequisites: Agronomy 102, 301, and 302 or 304, and C. E. 242 and 243.

Elective; senior year or graduate students; either semester or both; 2 to 5 credits.

Farm Mechanics.

401. Field Machinery. A detailed and comparative study of plows, harrows, rollers, packers, cultivators, seed cleaners, drills, mowers, rakes, binders, and manure spreaders. Factors having to do with the intelligent selection, use, and care of these machines are emphasized. Practical work in assembling, testing, and operating some of the more important field machines. Practice in splicing ropes, and tying useful knots and hitches. Farm fence construction and cost. Practice in using cement on the farm.

Elective; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

402. Farm Power Machinery. Special study of the gasoline engine, its construction and operation, with practice in adjusting, testing, and trouble hunting. Feed grinding and cutting machinery, pumps and hydraulic rams. Pipe fitting, babbitting, soldering, belt lacing, and valve grinding.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

403 Farm Motors and Tractors. Study of gasoline and steam tractors. Practice in handling and operating. Gasoline tractor accessories, such as lubricators, carburetors, ignition system, etc., are especially considered, as is also valve setting on steam engines. Electricity in its adaptation to farm operations, and to threshing and pumping machinery, are given attention.

Prerequisites: Agronomy 401 and 402

Elective; senior year; first semester; 3 credits; 1 recitation; 2 laboratories.

405. Orchard Machinery. The construction, proper adjustment, operation and efficiency of the machinery most commonly used in orchard work—tillage and seeding implements, gasoline engines, spray pumps, etc. Practice work also for those that require it, in plowing, methods of hitching, etc. This is a shorter course in Farm Mechanics especially adapted to the needs of horticultural students who cannot take the regular courses in Farm Mechanics. The work is given altogether from the mechanical standpoint—not from the standpoint of the horticultural applications or uses of the various machines.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods.

406. Farm Practice. A field practice course for students who have had no farm experience. All the time is spent in the field in actual practice work in carrying on ordinary farm operations, such as plowing and other tillage operations, seeding and harvesting work of different sorts, etc.

Elective; any year; first semester; $\frac{1}{2}$ credit; field work.

407. Farm Practice. Continuation of Course 406.

Second semester; $\frac{1}{2}$ credit; field work.

411. Advanced Farm Mechanics. For the student with inclinations toward mechanics, a wide field is offered in advanced work in testing the efficiency and cost of running various types of

farm power machines and engines; or of becoming expert on harvesting machinery; or in the designing of a complete series of farm buildings or in practical work on cement construction for farm purposes, etc.

Elective; senior or graduate years; either semester or both; 2 to 5 credits.

Farm Management.

501. Weed Eradication. A course designed for those specializing in crop production, dealing with the best farm practices of extermination of the more noxious or persistent weeds common to the United States, and particularly Oregon.

Elective; junior or senior year; first semester; 1 credit; 1 recitation.

503. Seminar. The preparation and discussion of papers or demonstrations on subjects of especial Agronomic interest. Inquiry into the development of different phases of the science at home and abroad. Joint fortnightly meetings, open to all agricultural students.

Junior year; second semester; 1 credit; 1 recitation.

504. Seminar. Senior year; second semester; 1 credit; 1 recitation.

505. Farm Management. A study of the various systems of extensive, intensive, and mixed farming, and the conditions under which each prospers or fails; methods of successful farmers; the application of business methods to farm operations; farm capital; farm labor; economic management of fields, work, stock, structures, crops, and machines; markets and marketing; relation of farming to other industries.

Elective; senior year; second semester; 3 credits; 3 recitations.

507. Semi-Arid Farm Management. A study of the farm management problems of the dry farmer and irrigation farmer, and the preparation of management plans dealing with fertility, rotations, equipment, labor distribution, forms of production, marketing, etc., as adapted to semi-arid conditions. A special feature of this course, when circumstances permit, will be a field excursion into the dry farming and irrigated sections of Oregon.

Elective; senior year; second semester; 1 credit; 1 recitation.

511. Advanced Farm Management. There is a rapidly growing demand for men of special knowledge in the management of

farms, or for work in farming areas of distinct types, where ordinary methods of crop production, crop rotations, and profit making do not suffice. In this course advanced study is made of different farming systems; or the management of special types of farming, such as dry land or irrigated areas, swamp or dyked lands, or farm management survey or practice work in the field is undertaken. By arrangement with the head of the department, students specializing in Farm Management may be placed, during the summer vacation of the junior year, on successful farms in communities where certain types of farming are well developed. From these farms as centers a survey of individual farms or of a certain phase of the farming of the community may be made and data secured for senior thesis work.

Elective; senior or graduate year; either semester or both; 2 to 5 credits.

ANIMAL HUSBANDRY.

PROFESSOR POTTER
ASSISTANT PROFESSOR KENNEDY
ASSISTANT PROFESSOR REYNOLDS (Extension)
MR. SAMSON
MR. NELSON

The course in Animal Husbandry is planned to fit the student for the actual raising of live stock on the farm, so that he may produce the highest grade of stock in the most economical and business-like manner. The student is thoroughly grounded in the underlying principles in order that he may successfully continue his study after leaving school, but the practical details are thoroughly treated and a special effort is made to keep the students in close touch with the financial phases of the industry. Students who take this work as their specialty are not expected to devote their entire time to live stock; but, on the contrary, to familiarize themselves with crop production, soil fertility, and other phases of general culture. They are expected also to study English, Economics, Commercial Law, and kindred subjects, all of which are so essential in the training of the young man who expects to become not only an up-to-date business stockman, but a good, useful citizen.

A. Stock Judging. A thorough drill in the judging of beef cattle, sheep, swine, and horses, accompanied by text book and lecture work on types and breeds of live stock.

First semester; 2 credits; 3 laboratory periods.

B. Feeding and Management. The practical details of the feeding, care, and management of all kinds of live stock, with special reference to practices common in the Northwest.

Second semester; 5 credits; 4 recitations; 1 laboratory period.

E. Elements of Stock Feeding. This course gives the students a working knowledge of the elementary principles of stock feeding, and familiarizes them with the methods of balancing rations, with feeding standards, and with nutritive ratios.

First semester; 2 credits; 2 recitations.

1. Stock Judging. The various types of farm animals are studied by score card and comparative methods, and the student is made familiar with the desirable and undesirable types of beef and dairy cattle, sheep, swine, and horses.

Freshman year; first semester; 2 credits; 3 laboratory periods.

2. Live Stock Management. The practical details of the care and management of live stock, stabling, grooming, sanitation, practical feeding, and kindred details of live stock farming, all with especial reference to Oregon conditions.

Sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period.

6. Principles of Breeding. The principles of breeding as related to the development of our domestic animals. Among the topics discussed are variation, transmission of variations and modifications, fecundity, inbreeding, crossing, and like topics.

Prerequisites: Botany 41 and 42; Zoology 108, 109.

Senior year; second semester; 3 credits; 3 recitations.

7. Animal Nutrition. The chemical and physiological principles of animal nutrition, including digestion, assimilation, and metabolism; the composition of feed stuffs, and the function of the various classes of nutrients when taken into the animal body. Special attention is devoted to nutritive ratios, feeding standards, compounding rations, and the general significance of the chemical composition and energy value of the feeds.

Prerequisites: Chemistry 500 and 501. Animal Chemistry is to be taken at the same time.

Senior year; first semester; 2 credits; 2 recitations.

13. Research Work I. The student is expected to select some line for individual investigation, either by library methods or otherwise. The object is: first, to allow the student to study some particular subject in which he is especially interested; and,

second, to give him training in working out problems for himself, such as he will have to do after leaving school. This course is open only to those who are taking Animal Husbandry as their major, or who have taken practically all of the regular courses in Animal Husbandry.

Elective; senior year; first semester; credits and hours by arrangement.

14. Research Work II. A continuation of Course 13.

Elective; senior year; second semester; credits and hours by arrangement.

16. Advanced Stock Judging. Practical judging of all kinds of live stock, with occasional trips to fairs and stock farms. Judging teams for the Pacific International Stock Show will be chosen for the most part from this class.

Prerequisites: At least four credits of stock judging.

Senior year; first semester; 3 credits; four two-hour laboratory periods.

18. Seminar. Weekly meetings are held in which papers on Animal Husbandry subjects are read and discussed. These papers are prepared under the supervision of the department, although considerable latitude is allowed in the selection of subjects and the manner of presentation.

Junior or senior year; first semester; 1 credit.

19. Seminar. A continuation of Course 18.

Second semester; 1 credit.

21. Feeds and Feeding. An advanced course in the feeding of horses, beef cattle, sheep, and swine, consisting of a thorough training in the most approved methods of stock feeding. Especial study is made of the practices of the best stockmen, and of the investigations carried on by the various experiment stations. Students desiring to take only such parts of the course as relate to certain lines of live stock will be permitted to do so by arrangement with the head of the department.

Prerequisite: Animal Husbandry 7.

Senior year; second semester; 5 credits; 5 recitations.

23. Feeds and Feeding. A condensed course intended for those students who do not have the time necessary for Courses 7 and 21. While brief, the work is complete in itself and does not depend upon any other course. The feeding of beef cattle, sheep,

hogs, and horses is studied, with reference to both principles of nutrition and farm practice.

Elective to juniors and seniors in all agricultural courses except Animal Husbandry; second semester; 3 credits; 3 recitations.

24. A course similar to A. H. 21, except that Hog Feeding only is discussed, elective for juniors and seniors in Dairy Husbandry.

Prerequisite: A. H. 7.

Second semester; 2 credits.

100. Live Stock Practice. A course in the details of live stock management, taking up the subject in a more advanced form than in Animal Husbandry 2. The laboratory hour will be devoted to such work as dipping, dehorning, hoof trimming, shearing, horse training, and other common operations of the stock farm.

Elective to senior Animal Husbandry students only; first semester; 2 credits; 1 three-hour laboratory; 1 lecture.

Note.—The department reserves the right to limit the number of students in this course.

102. Live Stock Practice. A continuation of Course 100.

Second semester; 1 credit; 1 three-hour laboratory.

210. Types and Breeds of Horses. A study of the leading types and breeds of both light and heavy horses, beginning with the market grades and classes, followed by the breeds. Each breed is studied with reference to its early history, the environment under which developed, the foundation stock, the men who were instrumental in establishing the breed, subsequent development, and present status. Careful consideration is given to the leading families, or strains, and the most prominent animals, both in the country at large and in the Northwest. While the work is not entirely local in its application, especial effort is made to make the students familiar with the herds and the breeders with which they will come in contact when they engage in practical work after graduation. The lecture work is accompanied by comparative judging, in which particular attention is given not merely to the general merits of the animal, but to its conformity to the type or breed in question.

Prerequisite: Animal Husbandry 1.

Junior year; first semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

220. Types and Breeds of Beef Cattle. A study of the types and breeds of beef cattle as outlined under Course 210.

Prerequisite: Animal Husbandry 1.

Junior year; first semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

230. Types and Breeds of Sheep. A study of the types and breeds of sheep as outlined under Course 210.

Prerequisite: Animal Husbandry 1.

Junior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

240. Types and Breeds of Hogs. A study of the types and breeds of hogs as outlined under Course 210.

Prerequisite: Animal Husbandry 1.

Junior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

300. Pedigree Study. A laboratory study of the blood lines of the various breeds of live stock. Each student is expected to select one or two breeds as the basis for special study rather than to attempt to cover all breeds.

Elective; senior or graduate year; second semester; credits and hours according to arrangement.

400. Advanced Hog Feeding. A study of experimental data relating to hog feeding problems.

Elective; graduate year; second semester; 2 credits, hours by arrangement.

411. Graduate Research I. Graduate students will be given opportunity to carry on research work along any lines desired. The department is especially well equipped for graduate work along the lines of experimental feeding of hogs, sheep and beef cattle, live stock management, and all forms of library work with either experiment station and general live stock literature.

Elective; graduate year; first semester; credits and hours by arrangement.

412. Graduate Research II. Continuation of Course 411.

Elective; graduate year; second semester; credits and hours by arrangement.

DAIRY HUSBANDRY.

PROFESSOR GRAVES
ASSISTANT PROFESSOR SIMPSON
ASSISTANT PROFESSOR STOCKWELL
ASSISTANT PROFESSOR FITTS (Ext.)
INSTRUCTOR HOWARD

Dairy Production and Dairy Manufacturing are the courses which the Dairy department will offer.

Dairying is rapidly becoming the leading animal industry of the United States. The last census report shows that there are more than twenty million dairy cows in the United States and the annual value of their products is approximately six hundred million dollars.

Since the population of the country is rapidly increasing, as is also the per capita consumption of dairy products, it seems likely that the importance of the Dairy Industry will continue to advance.

The Pacific Northwest, on account of its even temperature and abundant growth of forage crops, is peculiarly adapted to dairying; and the rapid growth of this industry is creating splendid opportunities for young men in the various fields of dairying, such as the breeding of pure-bred dairy cattle, the management of dairy farms, and the management of creameries, cheese factories, and city milk plants. There are many other openings in government work, college work, and county advisory positions for those who do not care to enter the field of practical work.

The production and manufacturing courses are so arranged that the student may major in one course, and yet elect enough of the other course to enable him to have a working knowledge of that phase of the industry.

In the production work, it is the intention to give the student a thorough course in the breeding, feeding, judging, care, management, and diseases of dairy cattle.

In order to meet the needs of the industry and the demand for information, the department offers the following courses: A One-Year Course, designed to fit students for positions as operators of creameries and cheese factories or as managers of dairy farms. A Winter Short Course in both Dairy Manufacturing and Dairy Production. The Four-Years Course, designed to qualify students for agricultural college and experiment station work; for in-

spectors of dairy products and dairy establishments in city, state, or government service; or as managers of creameries or large dairy farms.

A. Testing Dairy Products. The testing of dairy products by the Babcock test, with special emphasis on conditions affecting the results of the test under practical conditions.

Required in one-year dairy course in Dairy Production, and in Dairy Manufacturing; first semester; 2 credits; 2 laboratory periods.

B. Buttermaking and Factory Management. The principles of creamery buttermaking; construction, management, and care of the creamery; a comparison of the various methods commonly used in the manufacture of butter in creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; churning and packing butter.

Required in one-year course in Dairy Manufacturing; first semester; 4 credits; 2 lectures; 2 laboratory periods.

C. Cheesemaking. The commercial manufacture of cheddar cheese, covering the process in detail; a comparison of the different methods commonly employed; a study of other varieties of cheese; factory management and construction.

Laboratory. Practice in making cheddar and other varieties of cheeses. Records are kept of the different operations to note their effect on the finished product.

Required in one-year course in Dairy Manufacturing; second semester; 4 credits; 2 lectures; 2 laboratory periods.

D. Ice Cream. The preparation of mixes for various frozen products by different formulas; the freezing, packing, and sale of frozen products.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 1 three-hour laboratory period; 1 lecture.

E. Creamery Practice. Work in the creamery, care of creamery machinery, repairing and cleaning apparatus, to familiarize the student with practical creamery work.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 2 three-hour laboratory periods.

F. Creamery Practice. Continuation of E; second semester; 2 credits; 2 three-hour laboratory periods.

H. Butter and Cheese Judging. Judging butter and cheese with score card; discussion of the defects of body and flavor.

Required in one-year course in Dairy Manufacturing; first semester; 1 credit; 1 three-hour laboratory period.

I. Butter and Cheese Judging. Continuation of H; second semester; 1 credit; 1 three-hour laboratory period.

J. Breeding, Feeding, and Management of Dairy Cattle. The history and development of the dairy breeds; a study of the breeding of the principal families of the various breeds; the selection and use of the pure-bred dairy sire in grading up the herd; the practice of inbreeding, linebreeding, and crossbreeding in improving dairy cattle. Feeding dairy cattle for economical milk production; feeding for records; developing the dairy calf; developing the dairy heifer; care of the dairy herd; care of the cow at time of parturition; methods of testing and record keeping; care and handling of the bull; the organization and purpose of cow testing, bull and community breeders' associations; the construction of dairy barns, milk houses, manure sheds, and silos; practical problems.

Required in one-year course in Dairy Production; first semester; 2 credits; 2 lectures.

K. Breeding, Feeding, and Management of Dairy Cattle. Continuation of J; second semester; 2 credits; 2 lectures.

L. Judging Dairy Cattle. Scoring animals by breeds and general score cards and placing classes of animals.

Required in one-year course in Dairy Production; first semester; 1 credit; 1 laboratory period.

M. Judging Dairy Cattle. Continuation of L; second semester; 1 credit; 1 laboratory period.

N. Dairy Practice. Practice in computing and mixing rations; tracing and compiling extended pedigrees; fitting animals for the show ring.

Required in one-year course in Dairy Production; first semester; 1 credit; 1 three-hour laboratory period.

O. Dairy Practice. Continuation of N; second semester; 1 credit; 1 three-hour laboratory period.

P. Special Creamery Tests. Advanced work in the use of the Babcock test. Short cuts and conveniences for rapid and efficient testing; rapid tests for adulterants and preservatives; curd, acidity, and sediment tests.

Required in one-year course in Dairy Manufacturing; second semester; 2 credits; 2 three-hour laboratory periods.

1. Elements of Dairying. The secretion and composition of

milk, and the causes of variation in composition; brief discussion of dairy cattle, and the factors in milk production; the Babcock test applied to milk and other products; use of the lactometer; the various methods of creaming; the operation of cream separators; the care of milk and cream; making butter under farm conditions. The general principles of cheesemaking; marketing of milk; dairy by-products; statistics and economics of the dairy industry.

Laboratory. The use of the Babcock test applied to milk and dairy products, with special attention to conditions that may affect the accuracy of tests; use of the lactometer; churning and working butter; a study of the construction, operation, and efficiency of various makes of cream separators; practice in ascertaining the yield of milk and fat, and the cost of production of cows in the College herd.

Required in all courses in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period.

2. Dairy Herd Management and Milk Production. Form and its relation to production; difference in the efficiency of dairy cows; improvement of dairy herds; methods of testing and record keeping; the use and importance of the pure bred dairy sire in grading up the herd. **Care of the Dairy Herd:** care of the cow at time of parturition; the dairy calf and its successful development; developing the dairy heifer; care of the bull; feeding for economical milk production and for records. Registered dairy cattle and their management, fitting for the show ring, advertising cattle, and sales. **Dairy Farm Economics:** the preservation and saving of manure; labor; crop systems for the dairy farm, soiling, pasturing, feeds; silage crops and the making of silage; the organization and purpose of cow testing, bull, and community breeders' associations. **Milk Production:** the production of market and certified milk; sources of infection and contamination of milk; the effect of different kinds of feed on flavor and healthfulness of milk; pasteurization of milk; contracts between milk companies and drivers.

Laboratory. Judging dairy cattle; scoring animals by breed and general score cards and judging classes of animals. Animals of the College herd will be used; and trips to local dairies, and an annual trip to prominent dairy farms in the Willamette Valley will be taken by College classes.

Required in courses in Dairy Production and Dairy Manufacturing; junior year; second semester; 5 credits; 3 recitations; 2

laboratory periods. Text: Eckles' Dairy Cattle and Milk Production.

3. Buttermaking and Factory Management. The composition of milk and cream; the effects of condition of milk and cream on the quality and yield of butter; pasteurization; starters; ripening and churning cream; packing and marketing butter. The location, organization, and construction of creameries; creamery refrigeration and management; creamery accounting; and other studies designed to fit the student to manage and operate creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; the use of starters; churning, with special attention to factors that control the composition of butter; packing and wrapping butter; the use of the acidity, moisture, and salt tests.

Prerequisites: Dairy Husbandry 1, Bacteriology 101.

Required in courses in Dairy Production; senior year; second semester; in course in Dairy Manufacturing; junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods.

4. Cheesemaking. The importance of quality and composition of milk in the manufacture of cheddar cheese; composition and characteristics of common American and European cheeses; ferments and fermentations and their control; factory management and construction; the making of cheddar cheese and some forms of soft cheeses.

Laboratory. Practice work in receiving and sampling milk; the use of the various tests for acidity, ferments, fats, solids, and casein; the making and curing of cheddar and other varieties of cheeses; the computation of yields, cost of manufacture, and profit; the effect of different methods of manufacture on yield and quality.

Prerequisites: Dairy Husbandry 1, Chemistry 502.

Required in course in Dairy Manufacturing; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Text: Principles and Practice of Cheesemaking, by Van Slyke and Publow.

5. Breeds and Breeding of Dairy Cattle. The origin, history, and development of breeds of dairy cattle, their distribution and their characteristics. A study of the breeding of the principal families of the various breeds. Application of the principles of Genetics to the breeding of dairy cattle.

Laboratory. Practice in the use of the breed herd books in tracing and making pedigrees. A study of methods of registering animals and advanced registry systems.

Required in courses in Dairy Production and in Dairy Manufacturing; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

6. Dairy Inspection and Dairy Farm Equipment. A. Application of Babcock test; use of the lactometer in detecting adulterations; rapid tests for various preservatives and methods of detecting adulterations; moisture, acidity, salt, curd, casein, and sediment tests; the score card system of dairy inspection; study of federal, state, and city laws governing the production and sale of dairy products; city milk inspection. B. Arrangement, construction, and equipment of dairy barns, milk houses, milk bottling plants, silos, manure sheds, covered exercise sheds, ice houses, and in planning and laying out dairy plants for special purposes.

Prerequisite: General Bacteriology.

Required in courses in Dairy Production and Dairy Manufacturing; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Text: Farrington and Woll's Testing Milk and Its Products.

7. Ice Cream and Ices. A study of the preparation, packing, and marketing of ice creams, sherbets, and related frozen products.

Laboratory. Practice in selecting and aging of cream for ice cream; standardizing and preparing the mix for the various frozen products; the freezing, packing, bricking, molding, coloring, and sale of the various frozen products; judging ice cream and related frozen products by the score card.

Required in course in Dairy Manufacturing; senior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

8. Seminar. The study and review of new experiment station bulletins, and general dairy periodicals and literature. Papers are presented by the student on dairy subjects. Practice in outlining investigational work is given.

Required of all seniors and advanced students majoring in Dairy Production and Dairy Manufacturing; senior year; second semester; 1 credit.

9. Butter and Cheese Judging. Judging of butter and cheese with score cards; discussion of defects of body and flavor.

Required in course in Dairy Manufacturing; senior year; second semester; 1 credit; 1 three-hour laboratory period.

10. Advanced Judging. Practice in judging dairy animals. This work, which includes trips to fairs and breeders' farms, is especially for those who desire to try for the Dairy Judging Team.

Elective; senior year; first semester; 1 credit; 2 two-hour laboratory periods.

21. Seminar. Required of all juniors majoring in Dairy Production or Dairy Manufacturing. Second semester; one credit.

30. Research and Thesis Work. This work is offered for senior and graduate students majoring in Dairy Husbandry. Investigational problems are assigned that will give the student training and experience in experimental work.

Elective for seniors and graduate students; first semester; credits according to arrangement.

Research and Thesis Work. Elective for seniors and graduate students; second semester; credits according to arrangement.

40. Dairy Herd Management. A course similar to D. H. 2, except that all laboratory work is eliminated.

Junior or senior years; second semester; 3 credits; 3 lectures.

HORTICULTURE.

PROFESSOR LEWIS
ASSOCIATE PROFESSOR GARDNER
ASSOCIATE PROFESSOR PECK
ASSOCIATE PROFESSOR KRAUS
ASSISTANT PROFESSOR BOUQUET
ASSISTANT PROFESSOR BROWN (Ext.)
MR. BROWN
MR. TUFTS
MR. BARSS
MR. MARSHALL
MR. MAGNESS
MR. MASTERTON

The scope of the work in Horticulture is very broad, giving instruction in Pomology, Olericulture, Floriculture, Landscape Gardening, School Gardening. In these courses the student is first thoroughly grounded in the fundamentals, and is then allowed to specialize as he may desire. Thus, he may fit himself for station or government work, or prepare for the many lines in horticultural business, such as fruit growing, truck gardening, floriculture, or landscape gardening; for in all these lines there are splendid opportunities throughout the Pacific Northwest. At the present time there are openings for young men to become managers of

orchards or to develop fruit lands for outside investors; those having a taste for teaching, can find a broad field in college or rural work or as supervisors of horticulture.

The required work for students electing horticulture covers a wide range, giving the student a thorough training, not only in plant propagation and the general principles of orchard management and vegetable growing, but in floriculture and landscape gardening as well, thus broadening his views and interesting him in the aesthetic and all that pertains to more beautiful surroundings.

The courses consist of lectures, reference reading, field exercises, and laboratory work. Much stress is placed upon the practical phases of all the work. In all courses horticultural truths are illustrated by practice, whenever possible. Students are given field and laboratory exercises in all such operations as planting, seeding, budding, grafting, cultivating, thinning, pruning, harvesting, and spraying.

The Horticultural Building contains modern laboratories for spraying, plant propagation, fruit packing, systematic pomology, and vegetable preparation. There are special class rooms, large draughting rooms, museum, and research laboratories. A new floriculture building and range of greenhouses assist materially in the work. The department is also establishing young orchards and vegetable gardens, and has at its disposal a large campus upon which are planted many species of trees and shrubs. The student is materially assisted in all of his work, and the research work especially, by the large additions that have recently been made to the horticultural library.

A. Horticultural Practice. Practical fruit growing, dealing with such subjects as the choice of locations, sites, soils, and varieties; the establishment of orchards, including staking, setting trees; the maintenance of the orchard, including such topics as tillage, maintaining orchard fertility, thinning, pruning, spraying; the propagation of the principal fruits, and the study of the most common methods of budding and grafting; handling the fruit crop, including picking and packing.

One-year course in Agriculture; first semester; 5 credits; 3 recitations; 2 laboratory periods.

B. Horticultural Practice. Continuation of Course A. The greater part of the work, however, will be devoted to vegetable

gardening and landscape gardening. The first part of the semester will be devoted to a fundamental study of vegetable gardening, and will deal with such problems as the choice of soils and locations; production of plants, including problems connected with the use of manures and fertilizers, irrigation, tillage, etc.; the harvesting and market preparation and disposal of vegetable products. The latter part of the semester will be devoted to a fundamental study of landscape gardening; and will deal with the fundamental principles and their application in beautifying the farm home.

One-year course in Agriculture; second semester; 5 credits; 3 recitations; 2 laboratory periods.

101. Principles of Fruit Growing. The problems incident to the establishing of an orchard. It includes a consideration of such questions as location, site, soils, windbreaks, variety selection, selection of nursery stock, and planting. Some attention is also given to problems incident to maintenance, especially the maintenance of the home orchard. It is designed especially for general agricultural students who are interested mainly in the orchard as an accessory of the general farm. At the same time, it is a fundamental course for students desiring to pursue other horticultural studies. The study of the principles of fruit growing will cease with the Christmas holidays, and the remainder of the semester will be devoted to landscape gardening. A series of lectures and laboratory practicums will be given on the beautifying of the farm home and rural public buildings.

Required of all Agricultural students; sophomore year; first semester; 3 credits; 3 recitations; 1 laboratory period.

Pomology.

102. Practical Pomology. A continuation of course 101. It deals especially with the problems incident to the maintenance of the commercial orchard, including a study of such questions as cover crops, fertilization, irrigation, frost occurrence and prevention, pollination, pruning, thinning, spraying, and spray injury.

Required of students majoring in Pomology; junior year; first semester; 2 credits; 3 recitations.

103. Orchard Practice. A laboratory course in which the student obtains actual practice in regular orchard and packing-house operations. The work includes tree planting, pruning, the preparation of spray solutions, a study of spray machinery, orchard spray-

ing, orchard heating, and the picking, grading, packing, and judging of fruits.

This course is open only to those who have taken or are taking course 102.

Required of juniors majoring in Pomology; junior year; first semester; 2 credits; 1 laboratory period of four hours scheduled for Saturday forenoons.

104. Orchard Practice. A continuation of course 103.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 laboratory period of four hours, scheduled for Saturday forenoons.

105. Plant Propagation. A study of the propagation of plants by means of seeds, separation, and division, layerage, cuttage, and graftage. Sufficient attention is given the subject of nursery management to acquaint the student with its more important features.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 recitation; 2 laboratory periods.

109. Viticulture. A study of the problems pertaining to the growing, harvesting, and marketing of both the American and European types of grapes. Soils, locations, pruning, training, harvesting, grading, packing, storage, etc., are some of the questions receiving attention.

Elective; open to juniors and seniors; second semester; alternate years; (not given in 1916); 2 credits; 2 recitations.

111. Small Fruit Culture. A study is made of the problems connected with the growing, harvesting, and marketing of such fruits as the strawberry, currant, gooseberry, raspberry, blackberry, loganberry, and cranberry.

Elective; open to juniors and seniors; second semester; 2 credits; 2 recitations.

113. Nut Culture. A study of the methods of growing, harvesting, curing, and marketing of such nut crops as the walnut, filbert, almond, and pecan. In the laboratory a detailed study is made of the leading varieties of these different nuts.

Elective; open to juniors and seniors; second semester; alternate years (to be given in 1916); 2 credits; 1 recitation; 1 laboratory period.

115. Systematic Pomology. A study of the principles underlying botanical nomenclature and variety description, classifi-

cation, and adaptation. A critical study is made of many varieties of fruits, of the influence of environment upon behavior of fruit trees and the development of their products. The student becomes acquainted with the more important fruit groups and their interrelationships.

Required of seniors majoring in Pomology; senior year; first semester; 4 credits; 2 recitations; 3 laboratory periods.

117. Commercial Pomology. The problems of handling fruit, including the picking and grading and packing of fruits; a study of the problems of transportation, storage, distribution, and marketing. Considerable attention will also be given to the planning of buildings for the packing and storing of fruit.

Required of seniors electing Pomology as a major; senior year; second semester; 2 credits; 2 recitations

119. Sub-Tropical Pomology. This course takes up in detail the problems concerned with the growing and marketing of such sub-tropical fruits as oranges, figs, olives, pineapples, etc.

Elective; senior year; first semester, 2 credits; 2 recitations.

121. Advanced Pomology. A finishing course in pomology. The students will first be given a general review to determine their knowledge of pomology. The course is designed especially to fit students for Civil Service examinations. The latter part of the course will be devoted to the study of some advanced problems in pomology, and will also include a study of orchard costs and economics, the cost of production, and marketing.

Elective; senior year; second semester; 3 credits; 3 recitations.

123. Seminar. A course especially arranged for senior and graduate students in Horticulture. A study is made of some of the advanced problems. Articles from the leading magazines on horticultural subjects, as well as station and Government publications, are reviewed.

Required of Agricultural seniors and advanced students having their major in Horticulture; senior year; first semester; 1 credit; 1 two-hour recitation.

Prerequisite: Course 123.

Required of seniors electing Pomology as a major; senior year; second semester; 1 credit; 1 two-hour recitation.

125. History and Literature of Horticulture. A study is made of the literature and history of Horticulture from the time of the Egyptians to modern times.

Required of seniors electing Pomology as a major; senior year; second semester; 2 credits; 2 recitations.

127. Plant Breeding. The principles of breeding. A study of some of the facts pertaining to variation, classification of variations, causes of variation, and the theories that have been advanced to explain the inheritance of characters. The class room work will consist of lectures, reference readings, and recitations; the laboratory work will acquaint the student with statistical methods of studying variation; and through greenhouse experiments he will become acquainted with some of the ways in which environment influences plant growth.

Elective; open to seniors and graduate students (and to juniors by special permission); first semester; 3 credits; 3 recitations; 1 laboratory period.

128. Plant Breeding. A continuation of course 127. A study of breeding systems and recent breeding work. For the laboratory work, each student will be assigned to some problem that will give him a knowledge of the technique involved in plant breeding studies, and of the methods that are employed in plant breeding investigations.

Elective; open to seniors and graduate students (or to juniors by special permission); second semester; 3 credits; 2 recitations; 2 laboratory periods.

Vegetable Gardening.

Students taking their major in this course are required to take Horticulture 301 and 401.

201. Vegetable Growing. This course is offered for the purpose of teaching the student the value of a well conducted farm or home vegetable garden, serving especially those students who cannot further pursue a horticultural course. At the same time, the work will be fundamental in the instruction of higher courses in commercial vegetable growing and marketing, for those students who desire to pursue work in this branch of Horticulture.

Required; sophomore year; second semester; 2 credits; 1 lecture; 1 laboratory period.

203. Practical Vegetable Gardening. This course is offered to those students wishing to learn the fundamentals of the business of vegetable gardening. The practices of the leading commercial growers in all phases of field management will be studied,

including such problems as vegetable soils, locations, production of plants, distribution of crops, successions, rotations, manures and fertilizers, irrigation, implements, capital, labor, and other vital factors in the management of a commercial vegetable farm.

Required of juniors electing Vegetable Gardening as a major; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

204. Practical Vegetable Gardening. A continuation of the above course, designed especially for those who are specializing in vegetable growing. Course 204 offers work dealing with the methods used in the commercial production of vegetables for market, consisting largely of practicums in field and greenhouse so as thoroughly to acquaint the student with proper methods and management. The commercial testing grounds, trips to vegetable farms, and the College greenhouses give ample opportunities for the student to fit himself for later commercial work.

Required of juniors electing Vegetable Gardening as a major; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

205. Forcing Vegetables. The problems connected with the forcing of such vegetables as lettuce, cucumbers, tomatoes, rhubarb, and melons, in cold frames, hotbeds, and greenhouses. Lectures and exercises in the greenhouses.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 2 credits; 1 lecture; 1 laboratory period.

206. Forcing Vegetables. Continuation of course 205.

Prerequisite: Horticulture 205.

Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

207. Systematic Olericulture. Description, nomenclature, and classification of vegetables. Exercises are given in displaying and judging vegetables.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 1 credit; 1 laboratory period.

209. Commercial Truck Gardening. Only the purely commercial aspects of market gardening and trucking are offered in this course. Problems of growers in the production of vegetables on an extensive scale for market and cannery will be considered.

Students will be fitted by this course for extensive or intensive operations, and for managerial positions. Particular attention will be paid to modern methods of marketing vegetables; and the economics of producing vegetable crops will be treated in lectures and discussions.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

210. Commercial Truck Gardening. A continuation of course 209.

Prerequisite: Horticulture 209.

Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Landscape Gardening.

301. Landscape Gardening. All students should be interested in everything that pertains to the decoration of the home, the improvement of school grounds, the beautifying of streets, and the establishment of recreation grounds and parks. In the course in Landscape Gardening the general principles of this are so treated as to apply to the up-building of the aesthetic in everyday life.

Required of Agricultural juniors electing Horticulture as a major; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

303. Tree Surgery. The principles of tree surgery are presented and put into execution in the laboratory. All the varying cuts, cavities, fillings, bracing, and cultivating will be worked out in a practical manner.

Elective; junior year; first semester; 1 credit; 1 laboratory period.

304. Tree Surgery. A continuation of course 303.

Elective; junior year; second semester; 1 credit; 1 laboratory period.

305. Plant Materials. To create satisfactory landscape effects, one must have a broad knowledge of the materials with which landscape architects must work. A thorough study is given to trees, both evergreen and deciduous, shrubs, vines, perennial herbaceous plants, biennials and annuals, with a view to bringing out

their characteristics, such as foliage, color, form, adaptation, hardness, and artistic effect.

Prerequisite: Horticulture 301.

Elective; junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

306. Plant Materials. A continuation of course 305.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

307. Theory and Design. A study of the best works of prominent landscape architects, together with a wide range of collateral reading bearing upon the various problems. Private estates, public parks and play grounds, boulevards, and cemeteries will be carefully studied. Reports, such as those of park boards and landscape architects, will also be studied.

Prerequisites: Horticulture 301, 305, 306.

Elective; senior year; first semester; 2 credits; 2 laboratory periods.

308. Theory and Design. A continuation of course 307, in which a large portion of the time will be devoted to the preparation of planting plans. Outside time will be required for collateral reading.

Prerequisites: Horticulture 301, 305, 306, 307.

Elective; senior year; second semester; 3 credits; 3 laboratory periods.

309. Field Practice. A course in practical problems brought in from the field of practice. The student is required to make the surveys, do the engineering work incidental to the solving of the problem, make general plans, planting plans, grading plans, details, and, in short, perform all the duties ordinarily met with in the landscape architect's office.

Prerequisites: Horticulture 301, 305, 306. Civil Engineering required in freshman and sophomore year.

Elective; senior year; first semester; 3 credits; 3 laboratory periods.

310. Field Practice. A continuation of course 309.

Prerequisites: Horticulture 301, 305, 306, 309. Civil Engineering required in freshman and sophomore year.

Elective; senior year; second semester; 3 credits; 3 laboratory periods.

311. History and Literature of Landscape Architecture. De-

signed to give the student a good idea of the development of the art, and to bring him into close touch with the literature, past and current, that is, related to the subject.

Elective; senior year; second semester; 2 credits; 2 recitations.

313. Town Planning. This course is offered in order that the student may understand, in a general way, the underlying ideas of municipal, town, and village improvement. Literature and reports are studied, town problems discussed, and methods of procedure in town improvement worked out.

Elective; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Floriculture.

Students taking their major in Floriculture are required to take Horticulture 301 and 401.

401. Floriculture. An elementary course in the cultivation of greenhouse and home plants and of the common annuals and perennials used in outdoor work. The course is designed to broaden the views of those students who are unable to take advanced courses in Floriculture, and to make them more useful citizens.

Required of Agricultural juniors electing Horticulture as a major; first semester; 2 credits; 1 recitation; 1 laboratory period.

403. Greenhouse Construction. A course particularly adapted for students specializing in Floriculture and Truck Gardening. The problems connected with the building of greenhouses, hot-beds, and cold frames are dealt with; also the selection of materials; the various systems of heating and ventilating, and the value of the various types of buildings. Lectures and laboratory exercises in greenhouse and draughting room are conducted.

Elective, junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

405. Forcing Flowers. The propagation and problems of culture; such as soils, ventilation, and heat, connected with the forcing of plants used in the florist's trade.

Prerequisite: Horticulture 401.

Elective; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

406. Forcing Flowers. A continuation of Horticulture 405.

Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

501. Floriculture. As related to the cultivation of the common household and dooryard flowers, instruction is given in various subjects; namely, proper soils, planting of seed, transplanting, making of cuttings, cultivation, principles of heating and ventilating and control of insect pests and diseases. In addition, such problems as the grouping and arranging of flowers, so as to obtain the best color harmonies and most pleasing effects while growing, as well as for decoration purposes, are included. The lectures are supplemented by reference readings and laboratory periods in the greenhouse and garden.

Course in Home Economics; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

503. Landscape Gardening. The general principles of Landscape Gardening are taught, the aim being to give the student sufficient foundation to understand landscape gardening as applied to home decoration; to interest the student in the home beautiful; and the improvement of our public school grounds and city and village streets. A study is made of photographs, and of famous landscape paintings, showing good taste and design in various phases of Landscape Gardening. Lectures and reference readings are supplemented by field exercises.

Course in Home Economics; second semester; 2 credits; 1 recitation; 1 laboratory period.

505. Vegetable Gardening and Small Fruit Culture. Care of soil, seeding, rotation, fertilizing, and the selection of the best varieties of vegetables and small fruits for use in the home garden. Lectures, laboratory, and field exercises.

Course in Home Economics; second semester; 3 credits; 2 recitations; 1 laboratory period.

By-Products.

601. Horticultural By-Products. A general study of horticultural by-products, including a study of the growth and development of this important industry in this country and abroad, but more especially in the Pacific Northwest. In addition, the course will deal with the establishment of plants, their operation, and the fundamental principles connected with canning, evaporating, drying, and the manufacture of fruit juices.

Elective; junior or senior year; first semester; 1 credit; 1 recitation.

603. Dried Products. A detailed study of the evaporation and drying of fruits and vegetables. It will include a study of the types of buildings now used, and of the machinery and apparatus needed in the successful operation of the various types of driers. This course will also deal with the technique connected with the evaporation and drying and processing of such products as apples, pears, peaches, apricots, berries, and vegetables.

Elective; junior or senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Not offered in 1915-16.

506. Canning. A study of the establishment, management, and operation of canneries, including a study of necessary buildings, machinery, and the successful operation of canneries. It will also include a detailed study of the various methods used in canning, and in the manufacture of syrups, jellies, etc.

Elective; junior or senior year; second semester; three credits; one recitation; two laboratory periods. Not offered in 1915-16.

607. Fruit Juices. A study of the manufacture of cider, vinegars, and juices of such fruits as the apple, grape, and loganberry. A study will be made of the various types of buildings and machinery suitable for the manufacture of such juices, together with the study of the best methods embraced in the manufacture of fruit syrup and juices.

Elective; junior or senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Not offered in 1915-16.

Research.

The department of Horticulture is unusually well equipped for offering research work. In addition to the laboratory facilities, there are the greenhouses, experimental plots, and a splendid research library, well supplied with scientific books and periodicals, all combining to give the student unsurpassed facilities.

701. Research Work for Seniors. This course is offered for those seniors who are contemplating following college, experiment station, or Government work as a life career, or for those students who desire to have some special training in research technique. Problems will be assigned to the students which will give them experience in the laboratory, greenhouse, field, and library.

Elective; senior year; first semester; 3 credits.

702. Research Work for Seniors. A continuation of course 701.

Elective; senior year; second semester; 3 credits.

703. Advanced Thesis and Research Work. A course offered only for graduate students. Such students will be allowed to select problems in pomology, vegetable gardening, landscape gardening, floriculture, plant breeding, and the like.

Elective; for graduate students only; first semester; from 10 to 20 credits.

704. Advanced Thesis and Research Work. A continuation of course 703.

Elective; for graduate students only; second semester; from 10 to 20 credits.

705. Methods of Research. This course is offered to graduate or senior students interested in research work. It will be conducted as a research round table. Special drill will be given in the making of briefs and outlines of research problems, in methods of procedure in conducting investigative work, and in the preparation of bulletins and reports. The study of research problems conducted by the department of Horticulture will be taken up, and a close study made of the research work which is presented in bulletins from other institutions.

Elective; senior or graduate students; first semester; 1 credit.

706. Methods of Research. Continuation of course 705.

Elective; senior or graduate students; second semester; 1 credit.

POULTRY HUSBANDRY.

PROFESSOR DRYDEN
ASSISTANT PROFESSOR LUNN
MISS NIXON

In recognition of the importance of the poultry industry, and to meet the demands of students who aim to give special attention to this industry after leaving college, the department of Poultry Husbandry was established. Poultry keeping is a part of every well-regulated system of diversified farming, and at the same time offers opportunity for profit-making as a special business under special conditions. The two poultry plants at the College give exceptional opportunities for study of the practical as well as the theoretical side of the poultry industry.

A. Poultry Husbandry Optional Course. To meet the demands of those who are unable to take up the degree course, a one-year course has been arranged. The course will be thoroughly practical, and the student will be required to do work pertaining

to the various branches of poultry keeping, which will be supplemented with lectures and recitations in the class room.

One-year course in Agriculture; first semester; 5 credits.

B. A continuation of course A, but may be taken separately; second semester; 5 credits.

1. Poultry Husbandry. Includes a study of breeds of domestic poultry, their history, and classification. Laying and market qualities of different breeds are emphasized. Breeding fowls for different purposes will be considered, as will the location and construction of the poultry plant and its equipment. Laboratory work consists of practice in judging; preparing poultry products for market; construction of houses, coops, poultry plant equipment; and drawing of plans.

Required of all juniors in Poultry Husbandry; junior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

2. Poultry Husbandry. A continuation of course 1. Includes a study of poultry feeds and feeding with reference to egg and meat production. Reproduction by natural and artificial methods. Markets and marketing. Laboratory work consists of a study of poultry food stuffs and rations. Students will be given practice in preparing different rations. Practice will also be given in hatching and brooding. Each student will have charge of a pen of fowls, and during his period of management will do all the feeding and keeping of records.

Required of all juniors in Poultry Husbandry; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

3. Advanced Poultry Husbandry. For students specializing in Poultry Husbandry, advanced work will be given in the senior year. The work of this course consists of a study of poultry literature, conducting experiments, and writing up results.

Prerequisites: Poultry Husbandry 1, 2.

Required of all seniors in Poultry Husbandry; senior year; first semester; 4 credits.

4. Advanced Poultry Husbandry. A continuation of Course 3, together with assignments of special and original problems. Successfully to complete the advanced work will mean that the student has demonstrated his ability to lay out and manage a poultry farm; or to fill a college or station position in Poultry Husbandry. There is a growing demand for specialists along these lines.

Prerequisites: Poultry Husbandry 1, 2, 3.

Required of all seniors in Poultry Husbandry; senior year; second semester; 6 credits.

6. Practical Poultry Keeping. A course arranged to meet the demands of students who desire a knowledge of practical poultry keeping, but who are unable to elect a full year's course. The course includes the selection of stock; breeding farm poultry; poultry house equipment; methods of reproducing the flock; feeds and feeding; as well as markets and preparation of poultry products for market.

Required of sophomores in Agriculture; second semester; 2 credits; 2 lectures or recitations.

7. Markets and Marketing. Arranged for advanced study of poultry market conditions and the marketing of poultry and poultry products. Lectures or recitations consist of a study of available data and reports on original work. The laboratory course will supplement the work taken up in lecture and recitations. Students are required to do practical work, such as preparing poultry products for market, fattening, killing, dressing, and marketing fowls; and when possible, they will be in charge of actual marketing.

Elective; required of all juniors in Poultry Husbandry; first semester; 2 credits; 1 lecture or recitation; 1 laboratory period.

10. Feeds and Feeding. A study of feeds and feeding related to the different branches of poultry keeping. Lectures or recitations consist of a study of food stuffs, their composition, etc., used in poultry feeding; also methods of feeding chickens of different ages and the feeding of chickens for different purposes. Laboratory work consists of a study of the various food mixtures and practice in mixing various rations.

Elective; required of all juniors in Poultry Husbandry; second semester; 2 credits; 2 lectures or recitations.

***Poultry Diseases.** (Vet. Med. 12.) Elective; required of all seniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 2 laboratory periods; second semester.

***Anatomy of the Fowl.** (Vet. Med. 11.) Elective; required of all juniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 1 laboratory period; first semester.

*The two last courses named above are given as Vet. Med. 11 and 12.

VETERINARY MEDICINE.

PROFESSOR SIMMS

The object of the courses in Veterinary Medicine is to prepare the students to recognize disease, treat emergency cases, diagnose and control outbreaks of infectious diseases, and take care of sick animals.

A. Diseases of Dairy Cattle. A practical course given to the Dairy Husbandry students who are taking the one-year course.

One-year students; first semester; 2 credits; 2 recitations.

B. Diseases of Dairy Cattle. A continuation of Course 17. The laboratory work consists of a free clinic. The students observe methods of diagnosis and treatment of both medical and surgical cases.

One-year students; second semester; 2 credits; 1 lecture; 1 laboratory period.

C. Diseases of Domestic Animals. A practical course given to the Animal Husbandry students who are taking the one-year course. The laboratory work consists of a free clinic, which provides an abundance of animals for treatment.

One-year students; first semester; 3 credits; 2 recitations; 1 laboratory period.

1. Comparative Anatomy. Anatomy is taught in the most practical manner possible. Special attention is paid to the digestive systems of the horse and cow; to the foot, the muscles of locomotion, and the teeth of the horse. The laboratory work includes complete dissection of the digestive, urinary, genital, and respiratory systems, and partial dissection of the circulatory, muscular, and nervous systems.

Junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

2. Comparative Physiology. The study of the functions of the body. Special attention is paid to the digestive system. The physiological processes of all the domestic animals are studied, with special emphasis on the horse and cow. The laboratory work consists of practical experiments which are correlated with the lectures.

Prerequisite: Veterinary Medicine 1.

Junior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

3. Diseases of Live Stock. The parasitic, infectious, and non-infectious diseases of domestic animals are considered in this course. Special attention is given to the prevention and control of parasitic and infectious diseases. The laboratory work consists of a free clinic, which provides an abundance of both medical and surgical work. The students assist in handling and diagnosing the medical cases, and in operating on the surgical cases. They also observe the results of treatment of all animals in the hospital.

Prerequisites: Veterinary Medicine 1 and 2.

Senior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

4. Diseases of Live Stock. A continuation of course 3.

Senior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

5. Veterinary Histology. The histology of the domestic animals.

Elective; junior or senior year; first semester; credits to be arranged.

6. Veterinary Histology. A continuation of course 5.

Elective; junior or senior year; second semester; credits to be arranged.

11. Anatomy of the Fowl. A study of the structure of the body of the fowl. The laboratory work consists principally of dissection.

Junior or senior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

12. Poultry Diseases. The parasitic, infectious, and non-infectious diseases are considered. Special emphasis is placed upon methods of prevention and control of parasitic and infectious diseases. Students observe autopsies, methods of diagnosis, and treatment of fowls.

Junior or senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

14. Diseases of Live Stock. A one-semester course for Agronomy students. The more common diseases, with the methods of prevention and control, are considered. The laboratory work consists of a free clinic, which provides an abundance of animals for both surgical and medical treatment.

Junior or senior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

BACTERIOLOGY.

PROFESSOR BECKWITH
ASSOCIATE PROFESSOR COPSON
ASSISTANT PROFESSOR VASS
MR. McBURNEY.

The relationships of the comparatively new science of Bacteriology to everyday life in the various industries have increased so largely in numbers and intimacy that it is necessary for any student properly equipped in Dairying, Agriculture, Agronomy, Pharmacy, Home Economics, etc., to have a working knowledge of the subject.

As in any well-rounded subject, effort is in two directions which are closely associated, theory and practice. It is impossible for a student intelligently to carry out operations unless he understands the fundamental underlying theories.

The courses are so arranged in the department of Bacteriology that a student may take thorough preparation in the subject in a specific line, such as Pharmacy, Domestic Science, Agronomy, Sanitation, etc. This, in turn, if desired, may be followed by special research problems and advanced work.

In addition to the work outlined below, a series of lectures will be given to students in Forestry on the subject of Camp Sanitation.

406. Dairy Vocational Bacteriology. This course is given for the benefit of students taking the vocational course in Dairying. All matter presented is given from the most practical standpoint. The work to be included consists of consideration of the various kinds of contaminating organisms found in milk and their source, simple methods of control, bacteria in relation to milk inspection, methods of propagation of starters, and general methods for bacteriological examination of dairy products.

Vocational course in Dairying; second semester; 2 credits; 1 lecture; 2 laboratory periods.

101. Elementary Bacteriology. A series of lectures, experiments, and recitations to familiarize students with the underlying principles of bacteriology as applied to everyday life; and as an introduction to the more advanced courses in this subject.

The course in Agriculture; sophomore year, or Commerce, first year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

102. Elementary Laboratory Bacteriology. A course given for the purpose of supplementing the lecture and laboratory work of Bacteriology 101, to those who care to take it.

Prerequisite: Bacteriology 101.

Elective; junior year; second semester; 2 credits; 2 laboratory periods.

111. General Bacteriology. Beginning with the first semester of the junior year, a student may take bacteriology through the two semesters of that year, then continue advanced work through the two semesters of the senior year.

Elective; junior year; first semester; 4 credits; 1 lecture; 1 recitation period; 3 laboratory periods.

112. Advanced Bacteriology. A continuation of course 111, the laboratory work familiarizing the student with special bacteriological apparatus and its use, then gradually proceeding into advanced work involving questions of pure science, as well as the application of bacteriology to the professions and industries.

Elective; junior year; second semester; 4 credits; lectures; laboratory work.

116. Research in Bacteriology. A thesis may be selected in this subject, beginning with the first semester, junior year, major bacteriology, and continuing through four semesters. The laboratory is especially equipped for work in agricultural bacteriology, and has ample facilities also for research in veterinary, domestic science, or pharmaceutical bacteriology. Work for the master's degree, either as a major or minor in the department, may be selected. The investigations are all outlined and conducted by the student in cooperation with the head of the department.

Elective; senior year; credits to be arranged.

201. Pharmacy Bacteriology. The regular course in Bacteriology required for Pharmacy students, consisting of lectures and laboratory work dealing with the medical aspects of pharmacy.

The course in Pharmacy; senior year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

202. Pharmacy Bacteriology. Continuation of Pharmacy Bacteriology 201, elementary clinical diagnosis, classification of bacteria, qualitative and quantitative determinations.

Prerequisite: Bacteriology 201.

The course in Pharmacy; senior year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

203. Clinical Bacteriology. This course, intended primarily for students in Pharmacy, deals with practice work in the ordinary methods of clinical diagnosis in use. Typhoid, diphtheria, tuberculosis, various pus formations, bacteriological examination of urine and feces, blood counting and differentiation into its elements, and dark ground illumination, are some of the subjects treated.

Prerequisites: Bacteriology 201, 202.

Elective; senior year; first semester; 2 credits; 2 laboratory periods.

204. Clinical Bacteriology. A continuation of the outline presented in course 203.

Prerequisites: Bacteriology 201, 202, 203.

Elective; senior year; second semester; 2 credits; 2 laboratory periods.

205. Immunity and Vaccine Therapy. A study of the standard methods in vogue in the various immunity and therapeutic reactions, such as antitoxin formation, preparation of vaccines, and standardization.

Prerequisites: Bacteriology 201, 202, or equivalents.

Elective; senior or graduate year; credits to be arranged.

300. Domestic Science Bacteriology. This course deals with bacteriology in its relation to home life. An introduction to the subject, therefore, is made along theoretical lines, with application to sanitation as concerns the house, covering such subjects as water supply, action of septic tanks, house sanitation, control and prevention of specific diseases, vinegar making, etc.

Course in Home Economics; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

301. Sanitary Bacteriology. This course is primarily for Home Economics students in continuation of Bacteriology 300. It deals with methods of sanitary bacterial examination in vogue for water, milk, butter, cheese, meat, air, etc. Certain simple clinical methods are taught. Use and action of antiseptics and germicides, and the methods of efficient fumigation are given proper attention.

Prerequisite: Bacteriology 300 or equivalent.

Elective for students in Home Economics, or others of equivalent preparation; junior or senior year; 2 credits; 2 laboratory periods.

203. Zymology. An elective for those of the course in Home Economics who desire a graduate course dealing with technical

yeast methods. The subjects include the microscopic structure of the yeast plant, the preparation and manipulation of special media designed for the growth of yeasts, pure culture methods used in zymology, methods of laboratory testing of commercial yeasts, both for use in breadmaking and alcohol production, and the bacteriology of salt-rising bread.

Prerequisites: Bacteriology 300 or equivalent.

Elective; 2 credits; 2 laboratory periods.

307. Preventive Medicine. This course is intended for the vocational home makers' course of the School of Home Economics, and deals with questions of bodily resistance to disease in everyday life, and the factors which aid or deter the spread of disease organisms. It includes such questions of home sanitation as pertain to the occurrence and transmission of disease organisms.

Vocational Home Makers' Course in Home Economics; first semester; 1 credit; 2 lectures.

401. Dairy Bacteriology. This course is devoted exclusively to milk and dairy products. It considers the source of bacteria in dairy products, simple methods of control, the usefulness of certain varieties, special media for milk, etc., methods for milk examination. It deals also with the economic use of pure cultures of micro-organisms in buttermaking; methods of perpetuating pure cultures for starters; laboratory methods of demonstration of pathogenic bacteria; leucocyte determinations.

Prerequisite: Bacteriology 101.

Senior year; first semester; 3 credits; 2 lectures or recitations; 2 laboratory periods.

501. Agricultural Bacteriology. Lectures and laboratory work relating to micro-organic life in the soil in its various activities, such as destruction of organic matter, humus formation, and the various nitrogen changes; but more especially to nitrogen fixation by legume bacteria. The technique of soil inoculation is also emphasized. Other phases of purely agricultural bacteriology are also considered.

Prerequisite: Bacteriology 101.

Elective; senior year; first semester; 3 credits; 1 recitation or lecture; 2 laboratory periods.

502. Agricultural Bacteriology. A continuation of course 501, dealing with consideration of special soil changes, such as ammonification, denitrification, non-symbiotic nitrogen fixation, sul-

phur combinations, and the effects of various methods of tilth on bacterial soil activities.

Prerequisites: Bacteriology 101, 501.

Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

600. Water and Sewage Bacteriology. Especially adapted to the needs of civil engineers; and devoted to the bacteriology of water supplies, sewage, and sewage disposal, according to the standards and methods of the American Public Health Association.

Elective; seniors in Civil Engineering, or of equivalent preparation; 2 credits; 1 lecture; 2 laboratory periods.

701. Poultry Disease Bacteriology. This course is intended to deal with the bacterial consideration of the more common diseases of poultry; and in it will be considered chicken tuberculosis, chicken typhoid, white diarrhoea, roup, and avian diphtheria; soil contamination, and other methods of disease transportation.

Prerequisites: Bacteriology 101, 102, or equivalent.

Junior or senior year; second semester; 2 credits; 2 laboratory periods.

BOTANY AND PLANT PATHOLOGY.

PROFESSOR JACKSON
ASSOCIATE PROFESSOR BARSS
ASSOCIATE PROFESSOR ATWOOD
ASSISTANT PROFESSOR LAWRENCE
MR. BAILEY
MR. HAMMOND
MR. OWENS
MR. VAN GUNDIA

The courses offered in the department of Botany and Plant Pathology aim not only to give the student a broad knowledge of plants, their structure, activities, and relationships; but to show wherein the science of Botany is related to the problems of everyday life and the home, and to the practice of Agriculture, Pharmacy, Forestry, and Home Economics.

In the arrangement of work in the courses offered, the point of view of several groups of students is kept constantly in mind, and the work adapted to their needs. In order to make this possible in courses taken by students pursuing different lines of work, separate sections are provided.

The work of the department is carried on by means of recitations, lectures, and laboratory work. Text and reference books are used mainly as an aid in correlating the facts brought out in the study of the plants in the laboratory. Living plants are used wherever possible. Drawing is made an important feature of the laboratory work; because the student, in order to draw accurately, must have observed closely.

Particular attention is given to students desiring to take their major work in this department. Exceptional opportunities are offered, not only to those students who wish to prepare themselves for teaching Economic Biology and Botany in the public schools, but to those who wish to specialize in Botany and Plant Pathology preparatory to teaching or to investigational work in agricultural colleges and experiment stations, or in Government work.

The following courses are offered:

20. Principles of Botany. This course aims to present in a broad laboratory course the fundamental principles of Botany. The higher plants are first traced in their development from the seed to flower, special effort being made to correlate the study of morphology, histology, and physiology of the various parts. The morphology, evolution, and classification of plants will then be traced from lower to higher forms. Finally, the relation of plants to their environment, and their use in nature and to man will be studied. Throughout the course the economic relations of botanical study will be emphasized.

The course in Home Economics; freshman year; first or second semester; 4 credits; 2 recitations; 3 laboratory periods.

30. Forest Botany. This course is provided for the purpose of giving Forestry students a general course in Botany, together with special training in those branches of Botany concerning which the forester needs special knowledge. Particular attention will be given to microscopic structure of wood, and to the morphology of gymnosperms and angiosperms.

The course in Forestry; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

31. Forest Botany. A continuation of course 30.

The course in Forestry; freshman year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

35. Forest Pathology and Taxonomy. A continuation of courses 30 and 31, which are prerequisite. The first half of the

term will be devoted to an elementary study of Forest Pathology, consisting of a study of fungi in their relation to diseases of forest trees. During the spring the time will be devoted to practice in the identification of the plants making up the forest flora. This will include not only the taxonomic study of trees, but also of plants making up the forest floor; native forage plants of importance on the forest ranges will also receive attention.

The course in Forestry; sophomore year; second semester; 4 credits; 2 lectures; 3 laboratory periods.

41. Agricultural Botany. The fundamental principles of botany as related to agriculture. The general plan of the course will be as outlined in course 20, special effort being made to bring out the fundamental botanical principles underlying agricultural practice.

The course in Agriculture; freshman year; first semester; 3 credits; 2 lectures; 2 laboratory periods.

A section of Botany 41 is provided in the second semester for those students who enter the institution in midyear.

42. Agricultural Botany. A continuation of course 41. During the latter part of the term the time will be devoted largely to a systematic study of agricultural plants. Students will also be instructed in the use of keys and methods for the identification of plants.

The course in Agriculture; freshman year; second semester; 3 credits; 1 lecture; 3 laboratory periods.

45. Taxonomic Study of Farm Weeds and Grasses. This course aims to familiarize the students with the structure and classification of farm weeds and grasses. Practice will also be given in the identification of other plants of economic importance. A detailed study will be made of well-selected types. The student will make a collection and identify as many specimens as time will permit.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods.

50. Plant Physiology. This is an introductory course in experimental Plant Physiology, being essentially a study of the life processes of the plant, covering a survey of the nutritional processes, and the growth and the adjustment of the plant to its environment. In this work such subjects will be studied as the general properties of the living cell; principles underlying the

intake of the plant from the soil; transportation of materials through the plant; the water losses of the plant; the manufacture of foods, their transformations, digestion and assimilation; and respiration. Throughout the course the importance of a knowledge of the life processes of the plant as a basis for intelligent agricultural and horticultural practice will be emphasized.

The course in Pomology; junior year; elective in the courses in Agriculture; junior or senior year; second semester; 3 credits; 2 lectures; 2 laboratory periods.

51. Plant Physiology. A more advanced course, requiring as a prerequisite Botany 50. Further studies in the nutritional processes of plants, and the relationship of plants to the influence of environmental factors.

Elective; senior year; first semester; 3 credits; 1 or 2 lectures; 2 or 3 laboratory periods.

62. Special Morphology. An advanced course in the principles of plant morphology. It is designed to familiarize the student with the present information concerning the evolution of form, structure, and methods of reproduction for all groups of plants, except the fungi, and the bearing of this on the origin of seed plants. The students will also be given an introduction to the principles of taxonomic classification in each group.

Elective; junior or senior year; first semester; 3 credits; 2 lectures; 2 laboratory periods.

64. Plant Anatomy. This course is designed to present a more advanced study of plant structure than is possible in introductory courses. Various types of plant tissues and their origin will be studied, together with modifications due to environmental conditions. A study of the cell, its methods of division, cell inclusions, etc., will receive attention. In connection with this work the student will be instructed in the various methods of preparing tissues for microscopic study, including fixation, dehydration, infiltration and sectioning, staining, etc. Required of students specializing in Botany.

Elective; junior or senior year; first semester; 3 credits; 1 lecture; 3 laboratory periods.

66. Range Botany. A course dealing with the botanical problems of the range. It aims to familiarize the student with the forage and poisonous plants found on grazing lands. Special emphasis will be placed on the identification of the native grasses.

The ecological distribution of these plants will be studied in relation to the depletion, renewal, and maintenance of pastures and ranges.

Elective; junior or senior year; first semester; 2 credits; 1 lecture; 2 laboratory periods.

70. Pharmaceutical Botany. This course is designed to meet the needs of pharmacy students. The course is so arranged as to give the general principles of botany, together with a special application to the need of pharmacy students. Particular attention will be given to the study of the cell, cell contents, and types of tissues. Some attention will be given to training in the microscopic identification of drugs and drug adulterants. In the spring, practice will be given in the identification of pharmaceutical plants.

The course in Pharmacy; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

71. Pharmaceutical Botany. A continuation of course 70.

The course in Pharmacy; freshman year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods.

80. Seminar. Required of all graduate students in Botany and Plant Pathology. The work will consist of reports on advanced studies, and abstracts of articles appearing in experiment station literature, scientific journals, or the agricultural press.

Elective; junior or senior year; first semester; 1 credit will be allowed undergraduate students who attend meetings regularly, and who make satisfactory reports.

81. Seminar. A continuation of course 80.

Elective; junior or senior year; second semester; 1 credit as above.

82. Research and Thesis. Opportunity will be given students who desire to specialize in Botany and Plant Pathology to take up work not given in the regular courses, or to take up the investigation of special problems.

Elective; senior year; first semester; 1 to 5 credits.

83. Research and Thesis. A continuation of course 82.

Elective; senior year; second semester; 1 to 5 credits.

101. Principles of Plant Pathology. This course is designed to present the fundamental principles underlying the study of plant pathology. Following are some of the topics to which attention will be given in the course: causes and symptoms of disease in

plants; methods of dissemination and distribution of plant diseases; legislation and quarantine; principles of plant disease control; fungicides and their use; disease resistance in plants, etc.

In the laboratory, study will be made of representative plant disease-producing organisms, using these as an introduction to the classification of parasitic fungi.

The course in Pomology; senior year; Plant Pathology; junior year; elective in other courses in Agriculture; junior or senior year; first semester; 2 credits; 1 lecture; 2 laboratory periods.

This course is preparatory for, and required as a prerequisite to, all the following courses in Plant Pathology:

102. Diseases of Orchard and Small Fruits. A detailed study will be made of the cause and control of all the important fungous, bacterial, and physiological diseases of orchard and small fruits. Particular attention will be given to the diseases of those orchard trees and small fruit crops of importance in the Northwest. The laboratory work will include a careful study of the gross appearance, and the effect on the host of various diseases, as well as a microscopic study of the organisms causing the trouble and their relation to the tissues of the host. Frequent field excursions will be made for observations on the symptoms of important diseases.

Required in the course in Pomology; senior year; second semester; 2 credits; 2 lectures; 1 laboratory period.

104. Diseases of Vegetable Crops. Similar, in general, to Botany 102, but deals with diseases of vegetable crops.

Elective; junior or senior year; second semester; 2 credits; 2 lectures; 1 laboratory period.

105. Diseases of Field Crops. This course is designed for Agronomy students, to be taken in connection with Botany 101. Students will not be allowed to register in this course who do not also register in 101. The course is similar, in general, to Botany 102, but deals especially with the diseases of field crops.

Elective; junior or senior year; first semester; 1 credit; 1 laboratory period.

111. Laboratory Methods in Plant Pathology. A training course in the methods of investigation in plant pathology, including methods of keeping records, care of collections, culture work, inoculation, photographic work, etc.

The course in Plant Pathology; junior or senior year; second semester; 2 credits; 1 lecture; 2 laboratory periods.

113. Methods of Control of Plant Diseases. Designed to meet the needs of advanced students for a course in special methods employed in the practical control of plant diseases.

The course in Plant Pathology; junior or senior year; elective in the course in Agriculture; junior or senior year; second semester; 1 credit; 1 lecture.

Prerequisite: Botany 101.

115. Taxonomy of Parasitic Fungi. In this course, work more advanced than is given in Botany 101 will be taken up, on the taxonomy and phylogeny of plant disease-producing organisms. Practice in the identification of unknown forms will be given. A collection properly prepared for an herbarium will be required.

The course in Plant Pathology; senior year; first semester; 5 credits; 2 lectures; 4 laboratory periods.

116. Advanced Plant Pathology. Special diseases will be selected and studied thoroughly, both in the field and in the laboratory. Designed to give students training and experience in the original investigation of plant pathological problems; opportunity will be taken to study certain of the more important diseases in a more thorough manner than is possible in the introductory courses.

The course in Plant Pathology; senior year; second semester; 5 credits; 1 lecture; 4 laboratory periods.

Graduate Courses. Botany 51, 80, 81, 82, 83, 111, 113, 115, and 116 may be taken by graduate students as major or minor electives with full credit.

Opportunity will be given students to elect work in Economic Botany or Plant Pathology not offered in the above mentioned courses by registering in Botany 82 or 83, either as a major or minor subject. Students who elect Botany as a major must have completed the work, or equivalent, required in the freshman year of the Agricultural course.

Note.—Any of the courses outlined above except 20, 30, 31, 35, 41, 42, 70, and 71, may be taken as a minor elective by junior, senior, or graduate students in any course, upon consultation with the head of the department, provided the course to be elected is not regularly required in the course of study in which the student is registered.

ZOOLOGY.

PROFESSOR SYKES
MISS EDWARDS*
MR. BLAKE
DR. CHANDLER
MISS COLE

The interests of human life are so intimately bound up in the facts of animal life that today, at least, a general knowledge of the science of Zoology is considered a personal asset few students can afford to omit from their college course. The instruction in this department, therefore, is designed not only to awaken interest in the study of native birds, insects, and other animals to afford a basic knowledge of the structure and functions of the animal body, but particularly to develop the faculty for determining the dynamic value of an animal, or a group of animals, in the solution of the problems of everyday life.

By means of lectures, laboratory work, and field observations, the student becomes familiar with the form and habits of various representatives of the animal kingdom, learning something of the mechanism of living things, of their importance as active forces in nature, and of the biological laws according to which their development is regulated. The work is adapted, so far as is possible, to the particular needs of students in Agriculture, Forestry, Pharmacy, and Home Economics.

Opportunity is offered, moreover, to those who desire it, to receive training for teaching zoology, physiology, or nature study in the public schools; for development of the game and food resources of the State; or for the pursuance of studies in the field of research. In connection with the course in Pharmacy, the required work forms a valuable pre-medical course.

The following courses are offered:

101. General Zoology. A general study of animals, both vertebrate and invertebrate, running throughout the year, and introductory to advanced courses in the department; it is also designed for students who, without intending to pursue the subject further, desire a general view of zoological work and its problems. The work consists of lectures and laboratory work, supplemented by investigations in the field, and by collateral reading. The aim is to give the student a general knowledge of the different animal

*On Leave of Absence 1915-16.

forms, their distribution and habits, with special reference to mechanism and functions of the body.

The course in Pharmacy; freshman year; elective for other courses; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

102. Zoology. A continuation of course 101. The course aims furthermore to give an introduction to laboratory methods of dissection and experiment, and to present an outline of the more important biological theories, such as selection, adaptation, and heredity.

The course in Pharmacy; freshman year; elective for others; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

103. Functional Zoology. A brief course designed to give students in the School of Home Economics some conception of the structure and physiological activities of animals, as a basis for the work in Physiology. The work consists of a general survey of the forms and activities of living organisms, with general reference to the human organism.

The course in Home Economics; freshman year; first or second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

104. Embryology and Histology. A consideration of the origin and development of the individual body; the elementary structure of the adult organs and tissues. The work consists of the study of such typical vertebrates as the chick and the pig, with reference to other domestic animals and to man. It involves practice in micro-technique, such as killing, fixing, imbedding, sectioning, and reconstruction from serial sections, and it is adapted to the requirements of general students, as well as to those intending to study veterinary science or medicine.

Prerequisites: Zoology 101, 102; or 108, 109; or equivalent.

For students in Agriculture or Pharmacy, and others; junior or senior year; first semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each.

105. Embryology and Histology. A continuation of course 104.

Prerequisites: Zoology 101, 102; or 108, 109; or equivalent.

For students in Agriculture or Pharmacy, and others; second semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each.

106. Game Propagation. A laboratory and reading course, supplemented by field work in the propagation of food animals of the field, forest, and stream; the breeding and protection of game birds and mammals; methods of conducting game reservations; and a comparative study of game laws.

Elective for students in Agriculture and Forestry; first semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged. Not offered in 1915.

107. Ornithology. A lecture course and field study of the common birds of Oregon; the course aims to develop an interest in the native birds, their habits, and haunts, with particular reference to their usefulness.

Elective; second semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged.

108. Principles of Economic Zoology. A course which deals extensively with the facts and conditions which render animal life an important factor in the economic problems of life. Like 101, however, it aims to give the student a general knowledge of the different animal forms, their distribution and habits, and the more important physiological functions of the animal body; but it lays particular stress upon the dynamic interpretation of life. The course is designed to meet the particular needs both of students in Agriculture and in Forestry. The work will consist of lectures and laboratory exercises, supplemented by a considerable amount of collateral reading.

Required of Agricultural and Forestry sophomores; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

109. Principles of Economic Zoology. Continuation of course 108, which aims to bring the student in contact with the more vital economic problems to be met in the various fields of interest—agricultural or sylvan. An outline of the different biological theories will be presented with a view to enabling the student to come into possession of certain fundamental principles, the knowledge of which may afford him an insight into the more far-reaching significance of the problems of everyday life.

Required of Agricultural and Forestry sophomores; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

110. Animal Parasites. An advanced course for the study of such parasitic forms as flukes, tapeworms, nematodes, fish 'lice,' cattle ticks, etc., that affect the health of man, domestic, and food

animals; the study will be primarily ecological, the object being to obtain a more exact knowledge of the conditions which produce parasitism, to the end that by intelligent control, diseases and economic losses may be rendered less liable, and preventive measures made productive of more permanent results.

Prerequisites: Zoology 101, 102; or 108, 109; and 104, 105; or the equivalent.

Elective to students in Agriculture, Forestry, and Pharmacy; junior or senior year; first semester; 2 credits; hours to be arranged.

111. Protozoology. An advanced course for the study of microscopic animals with a view to their relation, beneficially or injuriously, to man, particular attention being paid to such pathogenic forms as blood spores and enteric parasites, with some reference to soil protozoans and water animalcules.

Prerequisites: Zoology 101, 102; or 108, 109; and 201, 202; or the equivalent.

Elective for students in Agriculture and Pharmacy; junior or senior year; second semester; 2 credits; hours to be arranged.

112. Research and Thesis. Opportunity will be given students who desire to specialize in Zoology and Physiology to take up work not given in the regular courses, or to undertake the investigation of special problems. Work for the master's degree, either as a major or as a minor in this department, may be selected. It is the policy of the department to allow the student to develop his own initiative in the selection of a problem, and in outlining and conducting his investigations, but with the cooperation of the head, or other member, of the department.

Elective for seniors and graduates; first semester; credits to be arranged.

113. Research and Thesis. A continuation of course 112.

Elective for seniors and graduates; credits to be arranged.

114. Aquiculture. Lecture, laboratory, and field course dealing with the problems and methods of sea-farming and fish culture; that is, the hatching and rearing of fish and other aquatic food animals, the planting and care of oyster and clam beds, and a study of the various methods of production and preparation for market.

Elective for Agriculture and Forestry students; first semester; credits to be determined; hours to be arranged.

116. Taxidermy. Lecture, laboratory and field course in the methods involved in the preparation of skins, the preservation of museum specimens, and a study and practice of the methods involved in field survey work.

Elective for Agriculture and Forestry students; second semester; credits to be determined; hours to be arranged.

120. Genetics. A lecture course dealing with the general principles of heredity, and the factors involved in variation and inheritance, the object being to afford students specializing in dairy husbandry, etc., a general knowledge of the fundamental principles of breeding. The course will be prefaced by lectures on the phenomena of reproduction; and will be followed by an explanation of the mechanism of heredity, involving a discussion of problems of inheritance of acquired characters, segregation, dominance, and sex determination, with respect to their application both to the human and to the domestic forms. The lectures are to be accompanied by frequent demonstrations, and supplemented by a considerable amount of collateral reading. Experimental problems may be outlined for practical investigation for those who may desire to carry on such work.

Elective for juniors in Agriculture, and others; first semester; 3 credits; 3 lectures.

201. Physiology and Anatomy. This course is intended not only for the general student, but also for those students particularly interested in this branch of Zoology, and for those who expect to study medicine. It includes a study of the structure, significance, and function of the human body, with reference to the animal body in general. As a foundation for the study of function, the laboratory course includes some work upon the gross anatomy and the histology of the various tissues and organs of a typical mammal. It also includes experiments and demonstrations with foods, the study of blood, nerve-muscle, reactions, etc.

Prerequisites: Zoology 101, 102, or the equivalent.

The course in Pharmacy; sophomore year; elective for other students; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

202. Physiology and Anatomy. A continuation of course 201, especially valuable to those who expect to teach Physiology in the public schools. In connection with the work in Pharmacy it forms

a valuable pre-medical course. Required course for Pharmacy sophomores.

Prerequisites: Zoology 101, 102, 201.

The course in Pharmacy; sophomore year; elective for other students; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

204. Physiology and Hygiene. A general course designed primarily to give Commerce students a practical knowledge of the functions and care of the human body in everyday life. The laboratory will be of such a nature as to furnish demonstration of the physiological principles.

Elective to Commerce in conjunction with Bacteriology 101; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

205. Nutritional Physiology. An advanced course dealing particularly with the processes of digestion, absorption, nutrition, secretion, and excretion.

Prerequisites: 101, 102, 207, 208; or the equivalent.

Elective for students in Home Economics; senior year; first semester; credits to be determined.

207. Physiology. The object of this course is to give to the Home Economics student that knowledge of life processes and anatomical relationships which will be most useful in maintaining the highest efficiency of the human mechanism. The chief functions of the human body and the laws of health falling naturally within the province of the physiologist, will be studied. The laboratory course will supplement the lectures and recitations, and include such experimental, histological, an anatomical work as will best serve the object of the course.

Home Economics; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

208. Physiology. A continuation of 207.

Home Economics; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

209. Neuro-Physiology. An advanced course designed to furnish a better mental equipment for students specializing in pedagogical psychology.

Prerequisites: 101, 102, 201, 202; or the equivalent.

Elective for seniors in Industrial Pedagogy, and others. Hours to be arranged; credits to be determined.

ENTOMOLOGY.

PROFESSOR WILSON
ASSISTANT PROFESSOR LOVETT

The courses in Entomology are planned to give the student sufficient knowledge of the subject to understand the proper relation of Entomology to the different phases of Agriculture; to meet the needs of the student specializing in Entomology; and to serve the needs of students from other departments in which certain special courses are required. Students who wish to elect Entomology as a major may, if they desire, specialize in one or more branches by choosing their research problems in definitely grouped subjects. These groups include General Entomology, Agricultural Entomology, Civic Entomology, Entomology for Horticultural Inspectors, and Forest Entomology.

The courses in General and Economic Entomology are intended to provide the student with sufficient training to enable him to identify the common insect pests, understand their habits and life history, and to apply the most approved methods for their control.

Forest Entomology includes the practical investigation of certain areas of timber to determine the kind and extent of insect infestation, methods of making out correct reports on forest insect infestation, and an investigation of the principles underlying control methods.

Advanced students in Entomology are provided with excellent opportunities for special instruction and research work. The library facilities are unusually good; the insect fauna of the western part of the State is distinctive, offering many new and interesting features for investigation.

Scheduled courses in this department will not be given to a class of less than five students.

The following courses are offered:

301. Introductory Entomology. An introduction to the study of insects by lectures, laboratory, and field exercises. Sufficient field work in collecting, and laboratory work in properly mounting and classifying insects, is provided to make the student familiar with the principal orders of insects. In this and succeeding courses in Entomology, the rearing of economic and other forms of insects, is carried on parallel with other work, to gain familiarity with the development and habits of insects. Each student is required to

familiarize himself with the life-history, habits, and means of controlling some insect of economic importance.

Prerequisites: Zoology 101, 102, and a collection of insects consisting of at least 250 specimens.

Required in the courses in Horticulture, Plant Pathology, and Entomology; elective in other courses; junior year; first semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period.

302. Entomology of Orchard and Small Fruits. An intensive study of the more important insect enemies of the apple, pear, prune, cherry, plum, currant, gooseberry, bramble fruits, and strawberry, and the critical examination of the methods to be employed in combating them. Each important pest will be studied in the field and laboratory, with a view to becoming thoroughly familiar with the appearance of the insect and its work in all its stages of development.

Prerequisite: Entomology 301.

Required in the courses in Pomology, Plant Pathology and Entomology; elective in other courses; junior year; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period.

303. Entomology of Truck and Field Crops. A course similar to 302, with special emphasis put on the intensive study of the insect enemies of celery, onion, beet, cabbage, kale, clover, vetch, potato, hop, corn, wheat, and oats.

Prerequisite: Entomology 301.

Required in the course in Vegetable Gardening; junior or senior year; elective for students in other courses; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period.

304. Forest Entomology. A study of insect injuries to forest trees and forest products, factors influencing their occurrence and the general principles of control work.

The course in Forestry; junior year; second semester; 3 credits. Hours to be arranged.

305. Forest Entomology. A continuation of course 304.

The course in Forestry; senior year; first semester; 2 credits; hours to be arranged.

Prerequisite: Entomology 304.

306. Advanced Entomology. This course is designed for those who desire to specialize in Entomology. The instruction includes lectures and reference reading on the biology of the principal

families of insects, supplemented by laboratory studies of typical life-histories. Considerable time is devoted to studying the habits of insects, particularly injurious species in the field; to collecting, rearing, mounting, and classifying them; and to becoming familiar with Entomological methods and literature.

Required in the course in Entomology, elective in the courses in Agriculture; junior year; first semester; three credits; one lecture; two laboratory periods.

307. Advanced Entomology. A continuation of course 306.

Required in Entomology, elective in the courses in Agriculture; junior year; second semester; 3 credits; 1 lecture; 2 laboratory periods.

308. Advanced Entomology. A continuation of course 306 and 307.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; first semester; 5 credits; 2 lectures; 3 laboratory periods.

309. Advanced Entomology. A continuation of courses 306, 307, and 308.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; second semester; 5 credits; 2 lectures; 3 laboratory periods.

In connection with courses 306, 307, 308, and 309, the student will be required to present a thesis detailing the results of a systematic study of some restricted group of insects, or of the biology of some particular species or group of species.

310. Household Entomology. A study of insects in their relation to pharmacy and to the household. The history and development of insects in medicine, insects in relation to disease, and insect pests of dwellings and stores. Control methods will be taken up in detail. This course is intended to prepare students in Pharmacy and Home Economics intelligently to understand the bearing of insects upon the household and community, and the principles underlying methods of control.

Primarily for Pharmacy students; open to students in Home Economics and to others by special permission; no prerequisite. Two credits; two lecture periods.

311. Beekeeping. A course in the theory and practice of keeping bees for profit and in relation to fertilization of orchard trees.

The College has an apiary in which students will be able to become fully acquainted with modern apicultural methods.

Elective in courses in Agriculture and Domestic Science and Art; second semester; 1 credit; 1 laboratory period.

310. Seminar. Senior and graduate students in Entomology. Reading, discussing, and abstracting the leading articles on Entomology as they appear in the scientific journals, horticultural press, current magazines, and experiment station literature.

Senior year; first semester; 1 credit.

311. Seminar. A continuation of course 310.

Senior year; second semester; 1 credit.

312. Problems in Forest Entomology. This course will include the study and application of methods of forest insect investigations. Each student will be assigned a practical problem in Forest Entomology to work out under direction.

Credits to be arranged.

313. Problems in Forest Entomology. A continuation of course 312.

Prerequisite: Entomology 312.

Credits to be arranged.

SCHOOL OF FORESTRY.

PROFESSOR PEAVY
ASSOCIATE PROFESSOR NEWINS
MR. CONOVER

Non-Resident Lecturers.

J. P. VanOrsdel, Portland Lumber Company.
E. T. Allen, Western Forestry and Conservation Association.
J. D. Young, Inman-Poulsen Lumber Company.
E. O. Siecke, Deputy State Forester.
T. Munger, Federal Forest Service.
J. C. O'Gorman, Wisconsin Logging Company.
Geo. M. Cornwall, Editor "The Timberman."

A. Forest Protection. Causes of forest fires; the methods of controlling forest fires; the proper organization of fire patrol over definite areas; fire fighting devices; lookout stations, telephone lines, roads, and trails, with reference to fire control; different methods, applicable to different regions.

Forester's short course; first semester; 3 credits.

B. Forest Protection. A continuation of course A.

Forester's short course; second semester; 3 credits.

C. Forest Measurements. The fundamental principles involved in computing the solid contents of logs and trees; methods of constructing scale rules; height measures; forest service methods of cruising timber; other methods; discounts for defects; volume tables. Practical demonstrations in the woods.

Forester's short course; first semester; 3 credits.

D. Forest Measurements. A continuation of course C.

Forester's short course; second semester; 3 credits.

E. Forest Surveying and Mapping. A study of the United States system of land surveys. Retracing surveyed lines; methods employed in marking surveyed lines; the use of the compass; the surveyor's chain; plane table; Abney hand level; practical field work in surveying; the use of the aneroid barometer in topographic surveying. The details of map making; conventional signs used in mapping.

Forester's short course; first semester; 3 credits.

F. Forest Surveying and Mapping. A continuation of course E.

Forester's short course; second semester; 3 credits.

G. Forest Improvements. The construction of roads, trails, telephone lines, lookout stations, bridges, cabins, etc. Costs.

Forester's short course; first semester; 3 credits.

H. Forest Improvements. A continuation of course G.

Second semester; 3 credits.

K. Forest Administration. The organization of the Federal Forest Service; the district office; the national forest. The State Forester's office; organization of the State work. Forms used in the transaction of forest business; the preparation of reports.

Forester's short course; first semester; 1 credit.

L. Forest Administration. A continuation of course K.

Forester's short course; second semester; 1 credit.

101. General Forestry. A general survey of the whole field of Forestry. A brief study of those economic conditions pointing to the necessity of conserving our natural resources. The forest regions of the United States. Forest ownership, private, state, and national. The elements of state and national forest policy. The economic importance of the forests to the United States and to Oregon in particular. Reference text: Moon and Brown, *Elements of Forestry*; Van Hise, *Conservation*.

Freshman year; first semester; 3 credits; 3 recitations.

102. General Forestry. A continuation of course 101.

Freshman year; second semester; 1 credit; 1 recitation.

103. Forest History and Economics. The development of European forestry. Progress of American forestry. The economic importance of forest products. Transportation as affecting the lumber industry. Reference text: Fernow, *Economics of Forestry*.

Junior year; second semester; 3 credits.

201. Silviculture. The art of establishing, developing, and reproducing trees, including their life-history, influences, modification and growth; the soil, climate, and other factors of site; types, theoretical silvicultural systems of management; the application of the clear cutting, selection, shelter wood, coppice, group, and strip systems, to American conditions. Reference text: Graves, *Principles of Handling Woodlands*.

Sophomore year; first semester; 3 credits; 3 hours field work; 2 hours lecture.

202. Silviculture. The improvement of woodlands; cleanings; thinnings; protection of forests as related to Silviculture, laying

emphasis upon methods of fire protection in the Northwest; artificial and natural regeneration; tree seeds, their structure, form, distribution; seed collection; seed testing; seed storage; generation periods; nursery practice; forest planting; planting plans; cost of planting. Silvical studies.

Sophomore year; second semester; 3 credits; 3 hours field work; 2 hours lecture.

203. Advanced Silviculture. In this course the forest regions of the United States are subdivided into silvicultural divisions. In each subdivided unit a study is made of forest physiography, prevailing forest types, silvicultural management, problems of protection, market relations, and a review of the silvical habits of trees important from the standpoint of management. The study of the divisions in the West embraces all the national forests of the six federal districts, and their location.

Junior year; first semester; 3 credits; 2 laboratory periods.

204. Advanced Silviculture. Silvical literature. Each student will be required to make a detailed silvical study of some definite forest tract, and present a thesis covering the work. Investigation of special silvical problems. The working out of problems of management under special conditions.

Junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

301. Mensuration. The methods of determining the contents of logs in cubic feet and in board feet; log rules; methods employed in cruising timber. Instruments used in timber cruising; volume tables; yield tables. Field work at the mills, and in the woods. Each student is required to cruise, describe, map, and prepare a complete report on a given piece of timber. Reference text: Graves, Forest Mensuration.

Junior year; first semester; 6 credits.

302. Mensuration. A continuation of course 301.

Junior year; second semester; 4 credits.

303. Forest Mapping. Drill in the detail of forest mapping. Lettering conventional signs. Topographic and plane surveys of rough timbered areas. The use of the Abney hand level, the aneroid barometer, the barograph, the plane table, and the hand compass.

Elective; freshman year; second semester, and sophomore year; first semester; 2 credits.

401. Forest Management. The business of administering the forest; policies with reference to National, State and private forests. The value of land for forest production; the value of young growth. The preparation of a detailed working plan for a given forest, a valuation survey, including volume and yield tables, maps and complete forest description. The organization of the administrative force of the forest. Reference texts: Chapman, Forest Valuation; Roth, Forest Regulation.

Senior year; first semester; 5 credits.

402. Management. A continuation of course 401.

Senior year; second semester; 5 credits.

404. Lumbering. The history of the lumber industry, including a study of the methods used in different regions; special attention to lumbering operations in the Northwest; the transportation of logs from the woods to the mill; the use of steam machinery in skidding and hauling; driving; the methods of milling; seasoning and grading; the cost of logging and milling with reference to some definite operation. During the course, each student will be required to prepare a report from data collected by personal study of some extensive logging and milling business. Reference text: Bryant, Lumbering.

Senior year; second semester; 5 credits; 2 recitations; 3 laboratory periods.

405. Forest Improvements. A study of the construction and maintenance of the permanent improvements essential to the proper management of a forest. Cost data. This involves roads, trails, cabins, telephone lines, fire lanes, fences, etc.

Senior year; first semester; 5 credits.

406. Field Work. This course is based upon practical work, performed by the student between the sophomore and junior years, or between the junior and senior years. The work must be done on some modern logging operation, or in connection with some technical forestry work carried on by the State or by the Forest Service. A report based upon an approved outline must be submitted.

From 1 to 5 credits.

408. Seminar. Preparation and discussion of reports on special subjects. Current forestry and lumbering literature. Each student is required to prepare a thesis on some assigned subject.

Senior year; first semester; 1 credit.

409. Seminar. Continuation of course 408.

Senior year; second semester; 1 credit.

501. Dendrology. Classification and identification of all forest trees, including a study of forest ecology and taxonomy; the silvical characteristics of commercial species; forest regions of the United States; relative importance of timber species; life-history and requirements of trees: Reference texts: *Trees of the Pacific Slope*, Sargent; *Trees of North America*.

Senior year; first semester; 5 credits.

502. Timber Technology. The studies in timber technology include both microscopic and macroscopic characteristics by which wood may be identified; cell structure from a taxonomic standpoint; defects due to knots, decay, checks; structural changes due to seasoning; relation between moisture content and strength; chemical properties. The course includes the subjects of Forest Utilization and Wood Preservation. In Utilization the adaptation of woods to the various minor industries is considered in detail, such industries as the following being discussed: pulp, cooperage stock, veneer, matches, charcoal, etc. In wood preservation the factors of decay and preservative methods are studied. Open tank and pressure methods of applying preservatives, and the relative value of different preservatives. Reference texts: *Record*, *Economic Woods of the United States*; Weis, *Preservation of Structural Timber*.

Senior year; second semester; 4 credits.

503. Advanced Dendrology. A continuation of course 501.

Elective; senior year; second semester; 3 credits.

504. Dendrology. The course in Dendrology for Logging Engineers is designed to suit the needs of the engineer without requiring the silvical studies which are considered in the forestry course. Species of commercial importance in the Pacific Northwest are studied in particular, and their taxonomic relations to all other species are clearly defined. Reference text: *Sudwicht, Trees of the Pacific Slope*.

Junior year; second semester; 3 credits.

505. Forest Protection. Protection from fire, insects, and fungi; and methods of control. The course deals mostly with protection from fire, laying emphasis upon preventive measures, such as the construction of lookouts, telephones, trails, roads, and fire lines. State and federal fire laws. Patrol associations; organiza-

tions of a patrol system, costs; fire fighting, equipment, and ration lists. Field demonstrations in transportation of supplies, and the use of the various hitches used in "packing." Reference texts: Forest Service Publications.

Sophomore year; second semester; 3 credits.

506. Commercial Woods. The course is designed primarily to meet the requirements of the woodworker in choosing the species of wood best adapted to his needs, and in identifying the woods commonly used; macroscopic and microscopic identification of different species; dendrology and its significance in wood technology; taxonomy, showing how trees are classed. Reference text: Noyes, Wood and Forest.

Junior year; second semester; Industrial Arts; 2 credits; 1 hour lecture; 3 hours laboratory or field.

601. Logging Railroads. The special problems connected with the construction of logging railroads, such as grades, curves, cuts, fills, switch-backs. Lectures and discussion, followed by field study on some extensive logging operation.

Junior year; first semester; 3 credits.

602. Logging Engines. A study of the construction and operation of engines used in logging operations. Laboratory and field work.

Senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

603. Bridge Construction. This course deals with the construction of the peculiar types of bridges used in logging operations. Factor of safety. Costs. Preliminary laboratory exercises, followed by studies on logging operations.

Senior year; second semester; 3 credits.

407. Logging Management. The business problems connected with logging; organization of the working crews; cost of operations; cost keeping systems; improved methods; efficiency studies. Experts in logging will deal with special phases of the subject.

Elective; senior year; second semester; 3 credits; 3 recitations.

604. Logging Devices and Equipment. Bridge, flume and chute construction; methods of slinging rigging; types of cars; skidding and loading devices; electrical machines used in logging; detailed investigation of costs and makes of equipment. Special reports accompanied by photographs, maps, and drawings, will be

required. At least three weeks of each semester must be devoted to the study of some up-to-date logging operation.

Senior year; first semester; 5 credits; 2 recitations; 3 laboratory periods.

605. Logging Devices and Equipment. A continuation of course 604.

Senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

606. Special Subjects. A study of special topics connected with the logging industry. Tax law, freight rates, special laws, etc.

Elective; senior year; first semester; 2 credits.

SCHOOL OF HOME ECONOMICS.**DOMESTIC SCIENCE.**

PROFESSOR MILAM
ASSISTANT PROFESSOR DOLMAN
ASSISTANT PROFESSOR LEWIS
MISS SMITH
MISS DAVIS
MISS MOORE

H. Food Preparation. Three lectures and twelve laboratory hours per week throughout the year. Food, its sources, its economical purchase, storage, and use. The effect of heat and micro-organisms on food, and the changes undergone by food material in the body. Careful instruction in the preparation of menus and the selection of food, that it may be properly adapted to the age and need of the consumer. Laboratory work in the preparation of vegetables, meats, breads, and fruits.

Home makers' course; first semester; 5 credits; 3 recitations; 4 laboratory periods.

I. Food Preparation. A continuation of course H. The greatest attention is paid to the preparation and service of meals, and to the purchase and preservation of food.

Home makers' course; second semester; 5 credits; 3 recitations; 4 laboratory periods.

J. Care of Children. Lectures relating to the physical, mental, and moral development of the child; the bathing and feeding of infants.

Home makers' course; second semester; 1 credit; 2 lectures.

K. Sanitation and Care of the Home. Lectures and laboratory hours relating to the study of the home. The choice of site for a dwelling. General construction, lighting, heating, plumbing, disposal of waste, and general care of the dwelling house. The laboratory time is devoted to the study of modern labor-saving devices of the household and the best cleaning agents, the care of floors and woodwork, and the common laundry operations. This course is optional with that of English.

Home makers' course; first semester; 2 credits; 2 lectures; 1 laboratory period.

L. Personal Hygiene. Discussion relating to the care of the skin, eyes, ears, and respiratory tract; the relation of clothing and posture to health and the necessity of exercise and fresh air. Such

elementary physiology as is essential to the understanding of this course is given in connection with these lectures.

Home makers' course; first semester; 2 credits; 3 lectures.

M. Home Nursing and Invalid Cookery. Lectures on the care of the sick room, the observation of symptoms, the administration of medicine, first-aid to the injured, and disinfection and management of contagious diseases. The laboratory consists of preparation of food for the sick, proper food combinations, and manner of service. This course is optional with that of English.

Home makers' course; second semester; 2 credits; 2 lectures; 1 laboratory period.

101. Food Preparation. An introduction to the subject of foods in their scientific and economic aspect. Laboratory work in the preparation of food, with a study of the changes brought about by the applications of heat, experiments being made to illustrate the principles involved. The classes prepare all of the common foods in many ways, serve simple meals, and study suitable food combinations.

Sophomore year; first semester; 3 credits; 2 recitations; 1 laboratory period.

102. Food Preparation. A continuation of course 101.

Sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period.

103. Food Preparation. A survey course of 101 and 102 for graduates of secondary schools with training in Domestic Science.

Sophomore year; first semester; 3 credits; 2 recitations; 1 laboratory period.

104. Food Preparation. This course elaborates the principles taught in Food Preparation 101 and 102, and introduces more advanced work. An application of the knowledge of the sciences is made by canning, preserving fruits, and making jellies. Bread, cake, other flour mixtures, and the preparation of vegetables and meats are also studied until the student has mastered the subject. The lectures are devoted to a study of nutrition.

Junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

105. Food Preparation. A continuation of course 104. Part of the time is devoted to the preparation and service of meals.

Junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

110. Experimental Cookery. The various methods and temperatures used in cooking are tested as to results. Wood, alcohol, oil, gasoline, and electricity are all used to produce the required heat and their comparative cost and effectiveness are studied. Labor-saving cooking devices are experimented with and the results recorded.

Elective; senior year; second semester; 2 credits; 2 three-hour laboratory periods.

120. Methods in Demonstration. A course in which students are prepared to give public demonstrations in food preparation. Lectures are given on the results to be attained from demonstrations, equipment required, organization of plans, and general methods of procedure. Demonstrations are given by various teachers before the students, followed by student demonstrations.

Elective; senior year; second semester; 1 credit; 1 three-hour laboratory period.

180. Food Preparation. For women desiring knowledge of home cookery. A study of typical foods and their preparation in attractive forms, with the planning and serving of meals.

One evening lesson per week. A term of twelve lessons.

Either semester; hours to be arranged.

190. Camp Cookery. Instruction in various ways of combining into palatable and nutritious products such food materials as are available for use in camps. The making of different kinds of breads, as well as mulligans, griddle-cakes, and other camp dishes; practice during the latter part of the course in preparing food out of doors by means of Dutch ovens; reflectors, and improvised cooking utensils.

Elective; junior or senior year in Forestry, Agriculture, Engineering and Commerce courses; second semester; 1 credit; 1 laboratory period.

201. Dietetics. A scientific study of food materials in their relation to the daily dietary of families under various conditions of health and environment; a study of the dietary standards and the metabolism of carbohydrates, fats, and proteins. A comparison of the nutritive values of the common foods, made by computing, preparing, and serving dietaries of specific costs, furnishing specific nutrients.

Elective; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

202. Dietetics. A continuation of course 201. During the second semester, special stress on invalid diets, and diseases as affected by food.

Senior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

210. Catering. Designed to prepare the students for positions in large institutions, and also enable them to establish and maintain tea rooms and lunch rooms, and to act as caterers for private entertainments. The students assist in the purchase, preparation, and service of foods in the cafeteria, and are expected to devote the equivalent of eighteen hours per week to the course.

Elective; senior year; either semester; 6 credits; 6 laboratory periods of three hours each.

301. House Sanitation. The house as a factor in health. Situation, surroundings, ventilation, heating, drainage, plumbing, lighting, and furnishing of the house. Investigation will be made of general sanitary conditions from a practical and scientific standpoint with special reference to the needs of the community, the household, and the school.

Junior year; first semester; 2 credits; 3 recitations.

501. Household Administration. The order and administration of the house, the proper division of the income, with a study of the budget; the maintenance of standards of efficiency; and a study of the domestic service problem.

Senior year; second semester; 3 credits; 3 recitations.

504. Institutional Management. The purchase of food and equipment in large quantities; methods of record keeping; and the general methods of sanitation and care of buildings wherein many are housed and cared for.

Senior year; either semester; 3 credits; 3 laboratory periods of three hours each.

510. Housewifery. A study in the efficient care of the house, from the chemical, economic, and practical standpoints, including such matters as the treatment of floors, walls, and woodwork; the removal of stains; the cleaning of rugs and carpets; laundering of household linen and clothing, and the selection of cleaning apparatus and machinery.

Junior year; either semester; 2 credits; 1 recitation; 1 laboratory period.

511. Home Nursing. The scientific care of the patient under home conditions, including the furnishings, temperature, and ventilation of the room; bathing, dressing, and administering food and medicine to the patient; and also a study of the other duties of the home nurse in aiding the physician intelligently to add to the comfort of the sick. This means the ability to recognize and correctly report symptoms; to relieve pain; to disinfect, and to treat wounds, burns, and sprains; as well as to meet successfully emergencies that may arise in the home.

Sophomore year; either semester; 3 credits; 3 recitations.

550. Modern Problems in Household Administration. The topics assigned for research will be chemical, physiological, bacteriological, economical, or sociological, according to the preferences and training of the individual students.

Graduate year; first semester; credits to be arranged.

551. Modern Problems in Household Administration. A continuation of the research work commenced in course 550.

Graduate year; second semester; credits to be arranged.

560. Social Ethics. $\frac{1}{2}$ credit; 1 semester.

701. Special Research in Cookery. In assigning research problems for graduate students, both the previous training and the students' preferences are considered. Assignment of problems to be worked upon during the year is made by the professor in charge.

Graduate year; first semester; credits to be arranged.

702. Special Research in Cookery. Continuation of research work commenced in course 701.

Graduate year; second semester; credits to be arranged.

DOMESTIC ART.

PROFESSOR BROOKS
ASSISTANT PROFESSOR ROBINSON
MISS HITCHCOCK
MISS PLATT
MISS PEER
MRS. SCHILLING
MISS SEELEY

The following courses are offered:

K. Hand Sewing and Garment Making. Lectures relating to textiles, their production, and manufacture, given for the purpose of assisting the home maker in her selection and use of the fabrics used in the home. Emphasis upon the care and storage of house-

hold linens. The laboratory work is planned so as to give the student the practical experience in the making of all needlework problems that are to be met in the home.

Home Makers' course; first semester; 4 credits; 2 recitations; 4 laboratory periods.

L. Dressmaking. Follows Course K. The lectures relating to the manufacture of cloth, its adulteration, economical purchasing, and use. Laboratory work giving the student experience in the making of wash dresses, childrens' dresses, woolen dresses, and the renovating and making of one woolen dress. Draughting of patterns, as well as the use of commercial patterns.

Home Makers' course; second semester; 4 credits; 2 lectures; 4 laboratory periods.

N. House Furnishing. A practical course in the decorating and furnishing of the entire house. The problems of the economic and artistic furnishing will be considered. Visits to house furnishing stores for the purpose of selecting materials will be a feature of this course.

Home Makers' course; second semester; 2 credits; 2 lectures; 1 laboratory period.

101. Sewing. The fundamental principles of hand and machine sewing applied to household linens and undergarments. Darning, patching, and care of clothing are considered.

The study of the development of the textile industries will give a deep appreciation for fabrics, and the responsibility for thoughtful purchasing.

Freshman year; first semester; 3 credits; 1 recitation; 3 laboratory periods.

102. Garment Making. Continuation of course 101 in which draughting and making of undergarments will be presented. Simple embroidery stitches will be taught where such are applicable. The study of cotton will give an added value to the garments being made.

Prerequisite: Domestic Art 101.

Freshman year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

201. Dressmaking. The fundamental principles of dressmaking; the draughting, making, and adjusting of patterns to measurements; the making of shirt waists, tailored skirts, and a simple cotton dress.

The textile work will be a study of linen.

Prerequisites: Domestic Art 101, 102.

Junior year; first semester; 3 credits; 1 recitation; 3 laboratory periods.

202. Dressmaking. Continuation of course 201.

The textile work will be a study of silk and wool.

Prerequisite: Domestic Art 201.

Junior year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

203. Tailoring. This course has for its problem the making of a cloth jacket suit. Careful draughting of the patterns and excellence of construction and finish will be required.

Prerequisites: Domestic Art 202 and 203.

Senior year; first semester; 3 credits; 1 recitation; 3 laboratory periods.

204. Advanced Dressmaking. Draughting and making of elaborate gowns. Emphasis on color combinations, technique, suitability of design for material used, and for purposes intended.

Prerequisite: Domestic Art 202.

Senior year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

301. Millinery. Designing and constructing buckram and wire frames. Making and placing of trimmings, renovation of materials, straw sewing, bow making, and the construction of a hat from foundation to completion.

Senior year; second semester; 2 credits; 2 laboratory periods.

401. Basketry. A form of decorative art which involves careful consideration of form, color, and design; these principles will be considered in the making of rugs, reed baskets, stools, and raffia baskets.

Elective; senior year; first semester; 2 credits; 3 laboratory periods.

404. Handwork and Weaving. The study of advanced handwork, knitting, weaving, embroidery stitches and design as applied to costume, embroidery, and decorative design for household purposes.

Elective; senior year; second semester; 2 credits; 3 laboratory periods.

501. House Construction and Decoration. Two lectures and two laboratory periods each week to the study of house construc-

tion and furnishings. The laboratory hours are devoted to the making of plans for medium-sized residences; the best utilization of space, the most economical placing of equipment, and the decoration and furnishing of a house in the most economical, sanitary, and artistic manner. The lectures relate to the development of house building and reasons for the selections. Every phase of house furnishing will be studied—floor coverings, furniture, linens needed, curtain hangings, china, silver, pictures—in such a manner as to give a full grasp of a problem likely to be met by every student.

Senior year; first semester; 2 credits; 1 recitation; 2 laboratory periods.

601. Advanced Textiles. The identification of textile materials, their names, kinds, prices, and widths; variation in weave in regard to beauty and strength; the use and value of cotton, silk, wool, and linen for clothing and household furnishings. The identification of fibers and substitute material by means of the microscope; the chemical examination of fibers, including tests to determine content of cloth and adulteration; and proper use of materials in relation to cleansing and laundering.

Elective; senior year; second semester; 2 credits; 2 recitations; 1 laboratory period.

701. Costume Design. Study of the figure; sketching of garments, hats, and gowns; draughting of patterns; designing and modeling in material; study of design for embroidery and dress decoration.

Elective; senior year; first semester; 2 credits; 1 recitation; 2 laboratory periods.

SCHOOL OF ENGINEERING AND MECHANIC ARTS.

CIVIL AND HIGHWAY ENGINEERING.

PROFESSOR SKELTON
ASSISTANT PROFESSOR EDGEComb
MR. DOLAN
MR. SMITH

The following courses are offered:

107. Mechanical Drawing. The use of instruments and the elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, and finally, the complete development of a working blue print of some simple device from sketches. Particular attention is given to free-hand lettering, general neatness, and accuracy.

Highway, Irrigation, and Mining Engineering; first semester; 3 credits; 3 laboratory periods.

111. Engineering Drawing. A continuation and extension of the previous work in drawing, with special reference to application in Highway and Irrigation Engineering. Practice in tracing and in blue and black line process printing will be given.

Prerequisite: C. E. 105.

The course in Highway Engineering and Irrigation Engineering; freshman year; second semester; 3 credits; 3 laboratory periods.

222. Plane Surveying. This course includes recitations, lectures, field and office work in the theory and practice of plane surveying. The theory and construction of the different surveying instruments are studied, and practice will be given in making their tests and adjustments. The United States public land surveys and land laws are studied. Forms of field notes, methods of balancing and plotting surveys, computing areas and like work, will have due consideration. Proper emphasis will be placed upon chain surveying. Surveys will be made of assigned plats, and descriptions prepared. Resurveys will be made where more than ordinary difficulty is encountered in the interpretation of descriptions and existing evidence.

Prerequisite: Math. 11 and C. E. 105.

The course in Highway and Irrigation Engineering and Land-

scape Gardening; freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods.

223. Topographic Surveying. This course will include the execution of a complete topographic survey of an assigned tract, including the base line measurement, transit, stadia, and plane table work, platting, and finishing the map.

Prerequisites: C. E. 222 and 105.

The courses in Highway Engineering, Irrigation Engineering, and Landscape Gardening; sophomore year; first semester; 5 credits; 2 recitations; 3 laboratory periods.

225. City Surveying. (Elective.) A study of the necessary precision; a survey of a portion of the city; also a new addition, including the preparation of plats, establishment of grades, etc.; survey and office work for preparation of plans for street improvement; preparation of estimates, etc.

Senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

232. Plane Surveying. In this course substantially the same ground will be covered as in course 222, except that there will be but two-thirds as much field practice.

Prerequisites: Math. 11, 21, 31, and Mechanical Drawing.

The courses in Mining, Forestry, and Logging Engineering; freshman year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

233. Topographic Surveying. A condensation of course 223, and in addition requires a rough topographic survey of a forested section.

Prerequisite: C. E. 232 or 222.

The courses in Forestry and Logging Engineering; sophomore year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

242. Farm Surveying and Leveling. This course is designed for Agricultural students, and consists of problems of chaining, elementary transit work, and in leveling. Most emphasis will be put upon leveling and its application to drainage and general irrigation work. Problems will be given in profile and contour work as applied to farm drainage, road construction, and irrigation.

Agricultural course; sophomore year; first semester; 2 credits; 2 laboratory periods with assigned lectures.

243. Topographic Surveying. This course is designed especially for those taking the Irrigation Farming course, and is an

enlargement on C. E. 242. A complete topographic survey and map of an assigned area will be made. Special emphasis will be put on the study of the relation of surface topography to methods of water distribution, drainage, etc., as illustrated by the assigned survey and map. Methods of locating ditches and of making estimates on grading for the same will be studied from the contour map.

Prerequisite: C. E. 242.

Irrigation Farming course; junior year; first semester; 2 credits; 2 laboratory periods with assigned lectures where required.

254. Plane Surveying. This is a condensation of course 222, and is designed to meet the needs of Mechanical and Electrical students who have not time for the longer course.

The course in Electrical Engineering; junior year; second semester; 2 credits; 2 laboratory periods.

252. Precise Surveying and Geodesy. A study of the precise methods of surveying and leveling, base line measurements, precise triangulation, determination of true meridian and latitude.

Prerequisites: C. E. 222, 223, 272.

Elective; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

272. Railroad and Canal Surveying. This course will include a study of the simple compound, and vertical curves, and of earthwork. Students will solve many problems both in the class room and in the field, and will make a survey of a canal, highway, or railroad, including a reconnoissance, preliminary survey, location survey, and estimates of earthwork. Emphasis will be placed on yardage estimates, cross-sectioning and earthwork computations, and details of construction.

Prerequisites: C. E. 222 and 223.

Highway and Irrigation Engineering and Landscape Gardening; sophomore year; second semester; 5 credits; 2 recitations; 3 laboratory periods.

274. Railroad Surveying. This course is designed especially for the Logging Engineering course, and takes up the survey of a railroad line through rough wooded country, including a reconnoissance, preliminary, and location surveys of such a line. A complete estimate of the yardage, and also of the cost of the line is made. The course also includes the study of the simple, compound, vertical, and transition curves.

Prerequisites: C. E. 232 and 233.

Course in Logging Engineering; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each.

281. Railway Engineering. Study of the methods of railway construction and maintenance, standard structures, trestles, tunnels, culverts, minor bridges, ballast, rails and rail supports and fastenings, yards and terminals. This course will be preceded by a brief review of the simple and compound curve and the railway spiral.

Prerequisite: C. E. 272.

Senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

282. Railway Engineering. Continuation of course 281.

Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

405. Roads and Pavements. A study of the fundamental principles of location, construction, and maintenance of roads, as well as a thorough study of the materials used in road and street building. Asphalt, brick, wood block, stone, concrete, and other forms of street pavements are carefully studied. This course is given in connection with a laboratory course, Exp. E. 131.

The courses in Highway Engineering, Irrigation Engineering, and Landscape Gardening; junior year; first semester; 3 credits; 3 recitations.

407. Highway Engineering. Economic grades and proper location for different soils and surfacing materials. Surface and sub-surface drainage. Culvert design and construction. Construction and maintenance of earth, sand-clay, gravel, macadam, concrete, brick, and other types of roads. Dust preventives and road binders. Preliminary surveys and estimates. Specifications.

Senior year; first semester; 4 credits; 3 lectures; 1 laboratory period.

408. Highway Engineering. Continuation of course 407.

Senior year; second semester; 4 credits; 2 lectures; 2 laboratory periods.

410. Economics of Highway Construction. Economic and social advantages of improved roads. The traffic census. Local and centralized systems of control. Highway laws of different states. Organization of construction and engineering forces. Cost

data. Methods of handling work. Forms of contract—lump sum, unit price, percentage and cost plus fixed sum.

Senior year; second semester; 2 credits; 2 recitations.

511. Graphic Statics. The study of the graphic methods of the solution of stresses in cranes, derricks, and roof and bridge trusses, and such similar problems. The course is a draughting room course and is made up of a series of problems to be solved graphically and checked analytically.

The courses in Highway, Irrigation, and Mechanical Engineering; junior year; first semester; 2 credits; 2 laboratory periods of three hours each.

513. Highway Bridges. Design of wood and steel highway bridges and trusses of the ordinary Pratt or Howe truss type, including the complete design, stress diagram, and detail drawings of the same. Both analytical and graphical methods will be applied to the determination of stresses in trusses under static and wind loads, and under static, moving, concentrated, and distributed loads.

Prerequisites: M. E. 251, 252.

Senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each.

514. Highway Bridges. A continuation of course 513. Advanced work in highway bridge design is taken up, including draw, cantilever, suspension, and arch bridges.

Senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

515. Structural Engineering. This course will include the original design, with the stress sheets, plans, and working drawings for a roof truss, plate, girder, pin-connected bridge and steel arch.

Senior year; first semester; 3 credits; 3 laboratory periods.

516. Structural Engineering. Continuation of course 515.

Senior year; second semester; 2 credits; 2 laboratory periods.

552. Masonry and Foundations. A study of the properties of stone, brick, lime, cement, and concrete as building materials, and of their uses in foundations, retaining walls, piers, and dams; the theory of the masonry arch, retaining wall and dam. Recitations, lectures, and work in draughting and computing room.

The courses in Highway Engineering and Irrigation Engineering; junior year; second semester; 3 credits; 3 recitations.

555. Design of Highway Structures. A draughting room course in the design of different kinds of structures required in

highway work. It includes the design of short span reinforced concrete slab bridges, short span I-beam bridges, culverts, tunnels, retaining walls for side-hill roads, etc. A study will be made also of the effect of drainage of roads and drainage areas upon the design of bridges.

Highway Engineering course; elective; senior year; 2 credits; 2 laboratory periods.

557. Reinforced Concrete. A study of the fundamental principles of reinforced concrete design as applied to beams, girders, and columns. Designs are made of beam, girder, slab, and arch reinforced concrete highway bridges, and also of reinforced concrete retaining walls and irrigation structures. A detailed drawing is prepared of one reinforced concrete highway bridge.

The courses in Highway and Irrigation Engineering; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

605. Engineering Seminar. The members of the senior class in the courses in Highway and Irrigation Engineering, and the professors and instructors, constitute the Engineering Seminar, which meets once a week. The purpose of this seminar is to bring the student in touch with engineering literature and practice. To this end, a number of journal reviews and papers on engineering subjects will be presented and freely criticised each week. The work will follow a previously arranged program.

Senior year; first semester; 1 credit.

606. Engineering Seminar. See course 605.

Senior year; second semester; 1 credit.

607. Contracts and Specifications. A study of the general principles and laws of contracts as applied to engineering, including the preparation and study of specifications and contracts based upon engineering structures designed by the individual student.

Senior year; second semester; 2 credits; 2 recitations.

ELECTRICAL ENGINEERING.

PROFESSOR DEARBORN
ASSISTANT PROFESSOR WOOSTER
MR. PEASLEE

The following courses are offered:

101. Electrical Engineering. Study of the sine wave and periodic alternating quantity; harmonic analysis; laws governing

the flow of current and energy; the magnetic and electrostatic circuit, production of rotating field by means of polyphase alternating currents in a distributed winding; losses in electric circuits; elementary theory of transmission lines.

Open only to juniors in Electrical Engineering. Course 101 must be taken concurrently with 201, and 102 concurrently with 202.

Junior year; first semester; 4 credits; 4 recitations.

102. Electrical Engineering. Continuation of course 101.

Junior year; second semester; 4 credits; 4 recitations.

103. Electrical Engineering. A study of the equipment of power plants, transmission lines, and distributing systems, and of the technical and economic problems connected with the generation, transmission, and distribution of electrical energy.

In connection with this course, inspection trips are made to the properties of various power companies. The expense of these trips will approximate twenty dollars, and should be anticipated by every Electrical Engineering student in his senior year.

Prerequisites: Courses 101, 102, 201, 202.

Senior year; first semester; 4 credits; 4 recitations.

104. Electrical Engineering. A continuation of course 103.

Senior year; second semester; 3 credits; 3 recitations.

105. Electrical Design. The design of transmission lines and distribution systems, both overhead and underground, with particular attention to costs.

Senior year; second semester; 1 credit; 1 laboratory period.

121. Survey of Electrical Industries. Lectures on the applications of electricity to the industries and a general survey of the field of electrical engineering.

Sophomore year; first semester; 1 credit; 1 recitation.

122. Survey of Electrical Industries. A continuation of course 121.

Sophomore year; second semester; 1 credit; 1 recitation.

201. Electrical Engineering Laboratory. Open only to juniors in Electrical Engineering and must be taken concurrently with 101, which it parallels. Study of electrical instruments; wave form and polarity of alternating currents; current, electromotive force and power relations in circuits involving resistance, inductance, and capacity; principles of operation of direct current dynamos and motors.

Consists of one laboratory period a week. Student is required to submit a preliminary report before performing experiment, and a final report upon its completion.

Junior year; first semester; 3 credits; 1 laboratory period.

202. Electrical Engineering Laboratory. Continuation of course 201. Must be taken concurrently with course 102. Study of hysteresis and eddy current losses in magnetic circuits, electromotive force and energy losses in electrical circuits; the separation of losses in direct current machinery; efficiency and loading tests of direct and alternating current machinery; properties of insulating materials.

Junior year; second semester; 3 credits; 1 laboratory period.

203. Electrical Engineering Laboratory. Characteristic performance of alternating current machinery, including alternator, synchronous and induction motor, synchronous converter and static transformer with parallel operation and pump back tests.

Preliminary and final reports are required.

Prerequisites: Course 101, 102, 201, 202.

Senior year; first semester; 3 credits; 1 laboratory period.

204. Electrical Engineering Laboratory. Complete engineering and commercial tests on standard electrical machinery, including standard acceptance tests on machines and plants, and special tests for engineering information. Tests will be run on outside plants under commercial operating conditions.

Prerequisite: Course 203.

Technical engineering reports are required.

Senior year; second semester; 3 credits; 1 laboratory period.

301. Study of Current Periodical Literature. Presentation of abstracts and discussion of current articles in electrical periodicals. Special emphasis will be laid upon English, address, and manner of presentation.

Elective to seniors in Electrical Engineering.

Senior year; first semester; 1 credit; 1 recitation.

306. Thesis. Elective, by permission, to seniors in Electrical Engineering. Only those whose past record indicates ability successfully to complete a satisfactory thesis, will be permitted to make this election.

Senior year; second semester; 2 credits.

309. Electrical Railways. A general study of the application of

electricity to street and interurban railways, covering traffic conditions, speed, time, curves, and rolling stock.

Prerequisites: E. E. 101, 102, 201, 202, or E. E. 403.

Required of seniors specializing in railway electrical engineering.

Senior year; first semester; 2 credits; 2 recitations.

310. Electric Railways. Continuation of course 309. A study of conditions governing the electrification of trunk lines; systems of electrification and transportation economics.

Prerequisite: E. E. 309.

Senior year; second semester; 3 credits; 3 recitations.

312. Railway Signalling. A course in block signalling, interlocking air brakes, and appliances.

Prerequisite: E. E. 309.

Required of seniors specializing in railway electrical engineering.

Senior year; second semester; 2 credits; 2 recitations.

313. Telephony and Telegraphy. A general study of the application of electricity to the transmission of intelligence. Manual and automatic telephony, duplex and quadruplex telegraphy, submarine and wireless telegraphy.

Prerequisites: Courses 101, 102.

Senior year; first semester; 2 credits; 2 recitations.

316. Illuminating Engineering. A study of artificial light sources and the application of these sources to illumination, both exterior and interior.

Senior year; second semester; 2 credits; 2 recitations.

317. Public Service Regulation. A study of regulation by commissions, service rules, appraisals, depreciation, and rate making.

Senior year; first semester; 2 credits; 2 recitations.

318. Central Stations. A study of the problems arising in the operation of electric systems. Public policy, competition, cost accounting, extensions, etc.

Senior year; second semester; 2 credits; 2 recitations.

403. Study of Electrical Machinery. Open to non-electrical students in the School of Engineering. A practical course designed to meet the needs of Civil, Mechanical, and Mining Engineers. Class room and laboratory study of electrical instruments, current, electromotive force and power relations; the operation, care,

and management of familiar types of dynamos, motors, both alternating and direct current, and transformers.

Required of seniors in Mechanical, Logging, and Mining Engineering and of certain groups in Civil Engineering.

Prerequisites: Elementary Chemistry, Physics, Calculus, Mechanics.

Junior or senior year; first semester; 3 credits; 1 recitation; 1 laboratory period.

406. Electrical Lumbering Machinery. A special study of the application of electricity to the lumbering and logging industry.

Prerequisite: E. E. 403.

Senior year; second semester; 2 credits; 2 recitations.

408. Electric Mining Machinery. A study of the use of electricity in mines and mining operations.

Prerequisite: E. E. 403.

Senior year; second semester; 2 credits; 2 recitations.

410. Electric Machine Drive. The characteristics of electric motors and their applications to machine shop tools and allied industries.

Prerequisite: E. E. 403.

Senior year; second semester; 2 credits; 2 recitations.

MECHANICAL ENGINEERING.

PROFESSOR COVELL
ASSOCIATE PROFESSOR PHILLIPS
ASSISTANT PROFESSOR ROSENCRANTS
MR. YODER

The following courses are offered:

151. Mechanical Drawing. The use of instruments and the elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, the helix with its application to screw-threads, and finally the complete development of a working blue print of some simple device from sketches. Particular attention is given to free-hand lettering, general neatness, and accuracy.

The courses in Electrical, Mechanical, and Logging Engineering; freshman year; first semester; 2 credits; 2 laboratory periods.

152. Descriptive Geometry. This work consists in the graphical solution of problems involving the projection of lines, surfaces, and solids.

All courses in Engineering; freshman year; first or second semester; 3 credits; 2 recitations; 2 2-hour laboratory periods.

153. Mechanical Drawing. A continuation of course 151, including mechanical lettering, line shading, isometric and oblique projection, gear curves and their application to spur, bevel, and worm gearing. Following this is the preparation of a typical set of working drawings, tracings, and blue prints of a complete machine. Rapid and business-like execution of work is insisted upon at all times.

The courses in Electrical and Mechanical Engineering; sophomore year; first semester; 3 credits; 3 laboratory periods.

156. Drawing. A course in elementary mechanical drawing, taught by a series of practice sheets in geometric construction, orthographic projection of simple parts of machines, and finally, complete working drawings and blue prints of simple apparatus or machines.

The course in Industrial Arts; sophomore year; second semester; 3 credits; 2 laboratory periods.

204. Mechanism. A study of mechanical movements, including velocity ratios; transmission of motion by linkwork, gearing, cams, and belting.

The courses in Electrical and Mechanical Engineering; sophomore year; second semester; 3 credits; 2 recitations; 2 2-hour laboratory periods.

The course in Logging Engineering; junior year; second semester; 3 credits; 2 recitations; 2 2-hour laboratory periods.

205. Machine Design. This course consists largely in applying the principles discussed in mechanism and in mechanics to the design of machine parts. The work includes among other things the study of screws, fastenings, shafting, belting, fly wheels, wheels, gearing, and machine frames.

Senior year; first semester; 4 credits; 4 recitations.

206. Machine Design. This course supplements and is directly dependent upon the recitation work of course 125.

The work is taken up from a practical point of view and applies such theory as is consistent with the approved methods of design. Designs and complete working drawings are made of machines.

Senior year; second semester; 3 credits; 3 laboratory periods.

251. Statics and Dynamics. This is essentially a course in theoretical and applied mechanics. Force systems are analyzed

and their effects upon rigid bodies, both at rest and in motion, are carefully studied. Methods of finding centers of gravity and moments of inertia are investigated, and their practical application is brought to the student's attention by solving a number of problems. The principles of work, energy, friction, and impact, are all studied with reference to their importance in the field of engineering.

Prerequisites: Differential and Integral Calculus, Math. 51, 52.

All courses in Engineering; junior year; first semester; 5 credits; 5 recitations.

252. Strength of Materials. In this course the general principles of mechanics are applied to the elements of engineering structures to determine their strength and fitness.

Some of the features are tensile and crushing strength of different engineering materials; strength and stiffness of beams or girders under different systems of loading, and various methods of support; supporting power of posts or columns; the application of torsion to shafts as a means of transmitting power.

The work throughout is exemplified by numerous problems which the student is required to solve.

Prerequisite: Statics and Dynamics, M. E. 251.

All courses in Engineering; junior year; second semester; 3 credits; 3 recitations.

302. Road Machinery. This course is designed to familiarize the student with the purpose, care, and manipulation of the different forms of power driven road machinery, both steam and gas, as exemplified in modern road construction.

The course in Highway Engineering; senior year; first semester; 1 credit; 1 laboratory period.

303. Elementary Steam Engineering. This course deals with the principles of steam engineering in a very elementary manner. Its purpose is to familiarize the student with the type of steam machinery largely used in the logging industry, such as donkey engines, logging locomotives, etc. This course is supplemented by course 255 in Experimental Engineering which must be taken in conjunction.

Course in Logging Engineering; junior year; first semester; 2 credits; 2 recitations.

305. Theory and Practice of Steam Engineering. This course includes a study of the elementary thermodynamic laws of gases

and vapors with reference to their application to engineering practice, and aims to fulfill the essential thermodynamic requirements of the gas and steam engineer. The work will be supplemented throughout with problems.

Prerequisites: Differential and Integral Calculus, Math. 51, 52.

The courses in Mechanical and Electrical Engineering; junior year; either semester; 3 credits; 3 recitations.

306. Advanced Steam Engineering. A continuation of course 305, in which more time is spent on the application of the principles of thermodynamics to power plant machinery and to a study of the interrelation of power plant apparatus, including steam prime movers and boilers and their auxiliaries.

The courses in Mechanical and Electrical Engineering; senior year; either semester; 3 credits; 3 recitations.

309. Steam Boilers. A study of the construction and operation of steam boilers, superheaters, economizers, heaters, boiler feeding devices, oil burning devices, and chimneys. It is the aim of this course to familiarize the student with modern methods and apparatus involved in the economic generation of steam.

Prerequisite: Course 305.

The course in Mechanical Engineering; senior year; first semester; 2 credits; 2 recitations.

312. Steam Turbines. The steam turbine has taken its place as one of the important factors in transforming energy into work. Hence the principles involved in its construction and operation should be well understood by engineering students. This course considers the flow of steam through pipes and nozzles and its action on turbine buckets. The effects of superheating are noted and some attention is given to steam turbine design.

Elective; senior year; second semester; 2 credits; 2 recitations.

316. Steam Power Plant Design. The work in this course includes the design and working drawings of steam power plant problems. Among other things considered, are the location of plants; the selection of engines, boilers, pumps, and heaters; the general arrangement of parts, including the connections, piping, and auxiliaries.

The course in Mechanical Engineering; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

325. Compressed Air and Refrigeration. A course devoted to the theory, design, and operation of air compressors, fans, and

blowers, the first part of the semester, and to the study of the theory and operation of commercial refrigeration systems the latter part.

Prerequisite: Course 305.

Elective in the senior year of the Mechanical and Electrical Engineering courses; first semester; 2 credits; 2 recitations.

331. Heating and Ventilating. Study of modern methods for the heating and ventilating of buildings. An outline of the work includes a study of several approved systems of heating by means of steam, hot water, or air; methods of computing radiating surface; effective methods of ventilation; general design, construction, and operation of plant.

The course in Mechanical Engineering; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

346. Internal Combustion Motors. In this course the application of thermodynamics to the internal combustion engine cycles, is studied with reference to the economy of operation. The theory of the combustion of gases and of the gasification of the liquid and solid fuels commonly met with in internal combustion engine practice, is discussed. The remainder of the time is devoted to a study of details, auxiliaries, and operation.

Prerequisites: Courses 305, 306.

Courses in Mechanical Engineering; senior year; second semester; 2 credits; 2 recitations.

351. Seminar. The seminar meets once each week to study progress and development in the field of mechanical engineering. Technical literature will be reviewed; assignments will be made in advance, covering new or special features of engineering work. Students are required to submit carefully prepared reports, criticisms, or comments.

The course in Mechanical Engineering; senior year; first semester; 1 credit; 1 recitation.

352. Seminar. A continuation of course 351.

The course in Mechanical Engineering; senior year; second semester; 1 credit; 1 recitation.

EXPERIMENTAL ENGINEERING.

PROFESSOR GRAF
MR. KNOPF
MR. BOALS*
MR. MILLER
MR. ODEEN

The courses in engineering laboratory practice are designed to familiarize the student with processes of investigation; to afford experience in conducting and reporting experimental engineering work; to secure data which shall verify and supplement theoretical instruction; and, to some extent at least, to give a practical knowledge of construction and management of machinery and apparatus.

Appropriate divisions of this work are regularly taken by students in all branches of Engineering, Forestry, and Industrial Arts, and may be elected by students in other courses. Special courses are offered, as listed in what follows, to meet the needs of the students in the different lines of work. An earnest effort is made, not so much to impart a mass of detail, as to develop in the student his powers of observation and his capacity for independent thought.

Reports are required of all experiments, and are regarded as a most important part of the work. They are carefully read and criticised as to form, neatness, conciseness, accuracy of expression and spelling, as well as accuracy of technical data and calculations. With this training, when the student completes the work, he should know how to prepare an acceptable engineering report, or how to arrange data for publication.

201. Applied Mechanics Laboratory. A study of experimental investigation, reduction of data, mechanical calculating devices, and the preparation of neat, concise, and accurate reports. The calibration of various measuring instruments such as gauges, pyrometers, transmission dynamometers, etc., is then taken up. After this follow exercises in the measurement of power, including a test of the transmitting capacity and slip of belting. Transverse, tensile, compressive, torsion, and other standard tests of the common materials of construction are made; the heating value of a sample of coal is determined; the course being then concluded by two exercises on the properties of an assigned lubricating oil.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. Statics & Dynamics, (M. E. 251), and Theory and Practice of Steam En-

*On leave of absence.

gineering, (M. E. 305), should also be taken in conjunction with this course.

Course in Mechanical Engineering; junior year; first semester; 3 credits apportioned as follows: preparation, $\frac{1}{2}$ credit; laboratory, 1 credit; report, $1\frac{1}{2}$ credits.

202. Power and Hydraulic Laboratory. A continuation of course 201, beginning with the use and calibration of the indicator and planimeter. Tests are then made on steam and gas engines, a boiler, an impulse water wheel, pumps, an air compressor, and other power equipment. Exercises are given in the setting of Corliss and slide valves, and the course is concluded with an economy test of a steam turbine operating condensing.

This work is covered in fifteen laboratory exercises, one each week, and a careful report of each experiment is required.

Prerequisite: Course 201. Advanced Steam Engineering, (M. E. 306), must be taken in conjunction with this course.

Course in Mechanical Engineering; junior year; second semester; 3 credits; apportioned as for course 201.

203. Advanced Mechanics Laboratory. A rather general course in experimental mechanics dealing with more advanced studies of materials, fuels, lubricants, bearing metals, belting, etc., with special reference to the application of the results to the requirements of the mechanical engineer in actual practice. Reports required.

Prerequisites: Courses 201 and 202.

Course in Mechanical Engineering; senior year; first semester; 3 credits, apportioned as for courses 201 and 202.

204. Advanced Power Laboratory. A course similar in nature to the preceding, but dealing with power and hydraulic machinery. Various tests and studies are made on the following: a triplex pump, an air compressor, a centrifugal blower, a steam turbine, a compound engine, and finally, a complete test of a simple condensing Corliss engine, including the heat balance and a verification of Clayton's analysis. Complete reports required.

Prerequisite: Course 203.

Course in Mechanical Engineering; senior year; second semester; 3 credits; apportioned as for the preceding.

205. Applied Mechanics Laboratory. Fifteen experiments consisting of exercises selected chiefly from courses 201 and 203.

A course designed especially for the seniors in Electrical Engineering.

Prerequisites: All of the Mechanical Engineering courses required of Electrical Engineering juniors. Advanced Steam Engineering (M. E. 306), should be taken in conjunction.

Course in Electrical Engineering; senior year; first semester; 3 credits, distributed as for course 201.

206. Power and Hydraulic Laboratory. Similar in grade and purpose to the preceding. Consists of exercises selected from courses 202 and 204.

Prerequisite: Course 205.

Course in Electrical Engineering; senior year; second semester; 3 credits, apportioned as in the preceding.

207. Applied Mechanics Laboratory. This course is similar in range of equipment studied to course 201, but since it is intended for students in the Industrial Arts course who do not have some of the theoretical work in power engineering, the work is taken up in a more general manner, stress being laid on those principles and details which are of special value to the teacher of manual training. Some time is also taken to explain the theory involved, and the students are taught to prepare neat and accurate reports of their work.

Prerequisites: Math. 11, and Phys. 1 and 2.

Course in Industrial Arts; senior year; first semester; 3 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 2 credits.

208. Power and Hydraulic Laboratory. A course similar in grade to the preceding, designed for seniors in the Industrial Arts course. The work consists of fifteen laboratory exercises and the usual reports are required.

Prerequisite: Course 207.

Required in Industrial Arts; senior year; second semester; 3 credits, apportioned as for course 207.

210. General Engineering Laboratory. A course designed for seniors in Mining Engineering and Ceramics, or for others who desire a brief, comprehensive course in mechanical laboratory practice. The work consists of ten exercises selected from courses 201 and 202, and embraces tests on materials, hydraulic machinery, and steam and gas engines. Reports are required as in the preceding.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52.

Courses in Mining Engineering and Ceramics; senior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 1 credit.

231. Cement and Highway Laboratory. An experimental study of Portland cement; standard A. S. C. E. and other methods of cement testing; examination of sands, grading of aggregates, determination of voids, etc., abrasion, hardness, toughness, cementing value, and other tests on macadam rock; tests of paving brick; standard tests on bituminous compounds.

This course is of broad scope, but is still sufficiently detailed to give the student a good working basis for the intelligent interpretation and preparation of specifications for the materials treated.

Prerequisites: Phys. 101 and 102 and Math. 51 and 52. Roads and Pavements, (C. E. 405), should be taken in conjunction with this course.

Courses in Highway Engineering and Irrigation Engineering; junior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 1 credit.

232. Structural Materials Laboratory. Standard tests of timber, iron, steel, brick, stone, etc., with special reference to the methods and specifications adopted by the American Society for Testing Materials, and other national engineering organizations. Following the general tests, some time is devoted to work on plain and reinforced concrete.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. This course should be preceded by course 231, and Strength of Materials (M. E. 252), should be taken in conjunction with it.

Courses in Highway and Irrigation Engineering; junior year; second semester; 3 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 2 credits.

233. Advanced Highway Laboratory. Following course 231, and designed particularly for those specializing in Highway Engineering. Different road and paving materials and binders are tested and their relative values determined. Sheet asphalt mixtures and bituminous mortars are studied, to determine the effects of various changes in the grading of the aggregates. Finally, samples of various types of roads and pavements are analyzed for density, composition, and grading, with special reference to their conformity with specifications under which built.

Prerequisites: Course 231, and C. E. 405.

Course in Highway Engineering; senior year; first semester; 2 credits; apportioned 1 to laboratory work and 1 to report.

235. Advanced Materials Laboratory. An advanced course offered as an elective to students who have completed course 232, and who desire additional laboratory work on materials. In the past, tests have been made on reinforcing steel, reinforced beams, hooped columns, water-proofing of concrete, thermal conductivity of concrete, study of stresses by strain gauge, etc., but the course is varied according to the special interests and desires of the students electing the work.

The course on Reinforced Concrete (C. E. 557), must either precede this course or be taken at the same time. The course cannot be given unless elected by at least five students.

Either semester as desired by majority; 2 credits: laboratory, 1 credit; report, 1 credit.

238. Timber Testing. A special course designed to meet the requirements of the students in Forestry. The work is covered in eight laboratory exercises, embracing cross-bending, compression, shearing, cleavage, and other standard tests of timber; a study of the effect of moisture content on strength; and a study of impact loads. The formulas for the reduction of data from tests are explained; and the students are taught the preparation of neat, accurate reports, such being required on all tests. In general, the methods and bulletins of the U. S. Forest Service will be used as a guide in the work.

Prerequisites: Phys. 1 and 2.

Course in Forestry; senior year; second semester; 1 credit.

Note: The work is covered in one three-hour laboratory period a week during the first half of the semester, for which one-half credit is allowed. The other half credit is given for the reports.

240. Logging Materials. A course for students in Logging Engineering, identical for the first half of the semester with course 238. During the second half of the semester studies and tests are made on the materials of particular interest to the logging engineer, as for example, bending tests on full size timbers, tension tests on cable, rope, and on wrought iron tie rods, etc. In all these experiments time is taken to explain the principles involved, and to point out their practical applications.

Prerequisites: Phys. 101 and 102.

Course in Logging Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit.

255. Steam Laboratory. A brief practical course on steam engines, boilers, and auxiliaries, intended for students in Logging Engineering. The work consists of eight exercises, including tests and studies of the following: pressure and vacuum gauges; steam calorimeters; injectors and feed pumps; boilers; slide-valve, automatic, and Corliss engines. A report is required for each exercise.

Note: Elementary Steam Engineering (M. E. 303), must be taken in conjunction with this course.

Course in Logging Engineering; junior year; first semester; 1 credit.

262. Hydraulic Laboratory. Study of methods of measuring water, calibration of weirs, orifices, water meters, etc. Determination of friction and loss of head in pipe lines and fittings. Study of water hammer, and test of hydraulic ram. Tests on water wheel, centrifugal, triplex, and other pumps. The work is covered in fifteen three-hour laboratory exercises, and a report of each test is required.

Prerequisites: Math. 51 and 52, and I. E. 102.

Course in Irrigation Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit.

265. Hydraulic Laboratory. A brief course of a practical nature intended to accompany the course in Hydraulics (I. E. 101), for students in Irrigation Farming. Studies and tests are made on the following: pressure and vacuum gauges; methods of measuring water; flow of water through pipes and orifices; hydraulic ram; water wheel; and various types of pumps. The work is covered in eight laboratory exercises, a report being required for each.

Note: Hydraulics, I. E. 101, must be taken in conjunction with this course.

Course in Irrigation Farming; senior year; first semester; 1 credit.

272. Gas Engine Laboratory. Study of mechanical details of engines, battery and magneto ignition systems, carburetors, and methods of governing. Analysis of gas engine cycles from indicator diagrams. Mechanical efficiency, regulation, and fuel economy tests. Economy, power, and tractive effort of automobiles.

The work is covered in fifteen laboratory exercises, and a report is required for each.

Prerequisite: The course on Internal Combustion Motors (M. E. 346), must either precede the course, or be taken in conjunction with it.

Course in Mechanical Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit.

291. Experimental Research Problems. An opportunity is given for advanced and suitably prepared students who are interested in engineering research, to work out original problems. These may be either of their own choosing, or suggested by the department, and may cover any subject within the scope of the department laboratories.

Prerequisites: Must be approved in each case, as they would vary with the work proposed.

Elective to seniors and graduate students; first semester; 2 credits.

292. Experimental Research Problems. A continuation of course 291.

Elective to seniors and graduate students; second semester; 2 credits.

IRRIGATION ENGINEERING.

PROFESSOR TEETER

The following courses are offered:

101. Hydraulics. A practical application of the principles of hydraulics to irrigation farming, arranged especially for agricultural students. It includes a study of the laws of water pressure in tanks, pipes, and flumes; the measurement of water by weirs, orifices, and current meters; the study of losses of head in pipes and the consequent effect on the discharge. The design of open channels; seepage losses; the operation of rams, pumps, and scoop wheels.

Elective for seniors in Agriculture; senior year; first semester; 2 credits; 2 lectures.

This course can be taken only in conjunction with Exp. Eng. 265, a 1-credit laboratory course, covering the same field.

102. Hydraulics. A technical course dealing with the elementary laws of liquids in motion and at rest; the weight and pressure of water on gates and dams; velocity and discharge through

orifices, tubes, pipes, and flumes; fluid friction, losses of head, and time of emptying reservoirs.

Prerequisite: M. E. 251.

Required of juniors in Highway, Irrigation, Electrical, and Mining Engineering; junior year; second semester; 3 credits; 3 lecture periods.

103. Hydraulics. A course similar to I. E. 102, including the dynamic action of jets and streams, elements of turbines, and water hammer.

Prerequisite: M. E. 251.

Required of seniors in Mechanical Engineering; senior year; first semester; 3 credits; 3 lecture periods.

202. Hydraulic Pumps and Motors. The application of the principles of hydraulics to the design, construction, and operation of pumps and water wheels; the various forms of wheels and pumps, their adaptability, and efficiency.

Prerequisite: Hydraulics, I. E. 102.

Required of seniors in Irrigation Engineering; senior year; second semester; 2 credits; 2 lecture periods.

204. Water Power. A general study of the development of water power on streams; the effect of pondage, storage, and load factor on the capacity and efficiency of the plant and equipment; a detailed study of the characteristics of modern water turbines, together with an investigation of the speed regulation and manner of governing large plants. Extensive numerical problems will be required of the students in this course.

Prerequisite: Water Supply Engineering, I. E. 301.

Elective for seniors or graduates in Irrigation Engineering; senior year; second semester; 3 credits; 3 lecture periods.

301. Water Supply Engineering. This course consists of preliminary investigations for determining the available supply of water for irrigation and domestic purposes; a study of general hydrology, steam gauging, the use of the mass diagram in the study of storage; ground water resources; the sources of water supplies; manner of conveying and storing water; requirements for fire protection; the economics of pumping and the proper installation of pumping plants. The solution of extensive numerical problems is required of the student.

Prerequisites: C. E. 511, I. E. 102.

Required of seniors in Irrigation Engineering; senior year; first semester; 4 credits; 3 recitations; 1 laboratory period of three hours.

401. Irrigation Engineering. This course treats especially of the operation and maintenance of large irrigation projects from the engineer's point of view. Precipitation, run-off, underground flow, sedimentation, fluctuation of stream flow, methods of determining losses due to evaporation and seepage; the phenomena of water logging and alkali deposits; drainage; the duty of water in all its phases; irrigation by pumps; the location of irrigation systems; diversion weirs, headgates, flumes and drops; the theory and practice of water measurements, water records, etc—these are the principal features dealt with in this course. A study is made of the methods practiced in other countries.

Prerequisite: I. E. 102.

Required of seniors in Irrigation Engineering; senior year; first semester; 2 credits; 2 lecture periods.

402. Design of Irrigation Structures. This course deals with the storage and conveyance of water; the design of headworks and flumes; the selection of dam sites; investigations of the stability of dams in use; the design of a dam by Wegman's method; the design of pipe lines, earthen dams, and reservoirs; the design of flash boards and movable dams, hollow dams, and their application to storage and pondage. This course consists entirely of numerical problems with occasional lectures on the solution of the same.

Prerequisites: C. E. 511, I. E. 401, and I. E. 102.

Required of seniors in Irrigation Engineering; senior year; second semester; 2 credits; 2 three-hour laboratory periods.

501. Drainage Engineering. This course deals with the surveys for, and design of large drainage systems, open ditch construction, dredging and cleaning of large drainage channels, the drainage of alkali lands, methods of computing sizes of tile drains, etc.

Prerequisite: I. E. 102.

Elective for seniors in Highway and Irrigation Engineering; senior year; 2 credits; 2 lecture periods to be arranged.

602. Water Law. A study of the development of the water laws of Oregon with reference to the appropriation of water for large power and irrigation projects; the basis of the right of appro-

priation, patentees, and appropriator; waters subject to appropriation, and the transfer of rights.

Prerequisites: I. E. 401 and I. E. 301.

Required of seniors in Irrigation Engineering; senior year; second semester; 1 credit; 1 lecture period.

701. Sanitary Engineering. Drainage systems of populous districts, including chemical and bacterial purification of sewage; collection and disposal of garbage; street cleaning; separate and combined water carriage systems; surveys, plans, and specifications; law of flow and determination of size and capacity; brick, terracotta, cement, and concrete sewers.

Prerequisite: I. E. 102.

Senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

802. Hydraulic Engineering. This consists of a brief study of the figure of the earth and the celestial sphere, followed by methods of determining latitude, longitude, time, and azimuth from the sun and stars; the location of soundings, maritime charting and mapping; and the fundamentals of navigation. Numerical problems are assigned to supplement the field work.

Prerequisites: C. E. 222-223, and Spherical Trigonometry.

Elective for juniors and seniors; second semester; 3 credits; 2 recitations; 1 laboratory period.

INDUSTRIAL ARTS.

PROFESSOR BRANDON
MR. PORTER
MR. RIDENOUR
MR. McCOMB
MR. WILTSHIRE
MR. THAYER
MR. MADDISON
MR. _____

A-1. Vocational Drawing. In each of the vocational courses the student spends six hours a week in drawing, closely related to the major work which he is pursuing. The beginning work is devoted to learning the elements of drawing, general use of the drawing instruments, lettering, general constructions, methods of representation, and free-hand sketching. An attempt is made to correlate closely the work in drawing with the work in the shops. In plumbing, the work consists in making details of lead joints, fittings, and connections of sinks, closets, lavatories; preparations

of floor plans and cross sections of buildings, showing plumbing installations. In patternmaking the drawing consists in making detail sketches of simple patterns, such as flanges, plates, brackets, hand wheels, stands, supports, and pieces of machinery such as are being built in the College shops. For students in the Electrical course, the drawing of details of dynamo electrical machine parts, such as pole pieces, commutators, switches, general switch board and power house layouts, is required. In the machinist's course, the work is along the line of details of machine parts, bolts, nuts, screws, and screw threads, assembled drawings of machines and machinery tools, steam and gas engine parts, and other machinery. In carpentry, details of furniture construction, of buildings, bridges, etc., form a prominent part of the course. For students of forging and foundry practice, drawing similar to that given to machinists and patternmakers respectively, is required.

Vocational course; Mechanic Arts; first year; first semester; 2 credits; 2 laboratory periods a week.

B-1. Vocational Drawing. Continuation of A-1; first year; second semester; 2 credits; 2 laboratory periods a week.

A-2. Vocational Drawing. Continuation of B-1; second year; first semester; 2 credits; 2 laboratory periods a week.

B-2. Vocational Drawing. Continuation of A-2; second year; second semester; 2 credits; 2 laboratory periods a week.

A-3. Vocational Drawing. Continuation of B-2; third year; first semester; 2 credits; 2 laboratory periods a week.

B-3. Vocational Drawing. Continuation of A-3; third year; second semester; 2 credits; 2 laboratory periods a week.

C-1. Carpentry and Cabinetmaking. The purpose of this course is to teach the pupil the elements of joinery as applied in cabinetmaking and the building trades. The beginning work is devoted to the principles of joining and to tool operations as involved in furniture making and interior finish, including design and construction, the proper use of tools, growth and strength of woods, shrinkage, warpage and seasoning of timber, staining and polishing. Considerable attention is given to the making of working drawings of simple pieces of furniture which are built in the shops. A study of the steel square and its uses is taken up the second and the third years, and the practical uses of the square are given in brace and detailed roof construction. This work will be developed through the construction of parts of houses, barns, roofs and

bridges. In like manner, the construction of cornices, gutters, brackets, columns, window frames, and stairways is attempted. The erection of buildings in reduced scale and full sized sections of buildings is a strong feature of the course.

Supplementary lectures will be given upon the proper care of edged tools; the various woods used in building construction, their proper selection and treatment; the measurement of lumber, glues, nails, screws, bolts, nuts, pins, straps, and other fastenings. Roof trusses, spans and braces and method of calculating their proper sizes; stair building, woodworking machinery, paints, shellacs, and varnishes; estimates and practice in working problems that are taken from the students' work, from trade journals and from actual plans and specifications of houses. These are some of the prominent features of the work.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods a week.

D-1. Carpentry and Cabinetmaking. Continuation of C-1; first year; second semester; 4 credits; 4 laboratory periods a week.

C-2. Carpentry and Cabinetmaking. Continuation of D-1; second year; first semester; 4 credits; 4 laboratory periods a week.

D-2. Carpentry and Cabinetmaking. Continuation of C-2; second year; second semester; 4 credits; 4 laboratory periods a week.

C-3. Carpentry and Cabinetmaking. Continuation of D-2; third year; first semester; 4 credits; 4 laboratory periods a week.

D-3. Carpentry and Cabinetmaking. Continuation of C-3; third year; second semester; 4 credits; 4 laboratory periods a week.

E-1. Patternmaking. The purpose of this course is to teach the elements of machine patternmaking. The student begins his course with exercises involving the use of bench tools, and the reading of working drawings. These exercises emphasize the necessity of draught, core prints, core boxes, of allowance for shrinkage of iron and other metals, and its effect on different shapes and thicknesses of castings. The student is taught how to join timber to prevent warpage and distortion of patterns by using segments, staves, ribs, etc. He is taught the meaning of trade names, such as boss, fillet, flange, rib, etc.; how to operate power machinery; to keep in repair belts and line shafting; to sharpen

planer, and jointer knives, band saws; and how to select materials, such as glue, lumber, shellac, and fasteners.

Much of the constructive work is upon parts of machines that are being built in the College shops, such as pulleys, pipes, fittings, valves, gear wheels, dynamo frames, lathes, emery grinders, gas engines, and other machinery.

More advanced work includes the calculation, laying out, and construction of globe valves; spur, bevel, and worm gearing propeller blades and cams.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods a week.

F-1. Patternmaking. Continuation of E-1.

First year; second semester; 4 credits; 4 laboratory periods a week.

E-2. Patternmaking. Continuation of F-1.

Second year; first semester; 4 credits; 4 laboratory periods a week.

F-2. Patternmaking. Continuation of E-2.

Second year; second semester; 4 credits; 4 laboratory periods a week.

E-3. Patternmaking. Continuation of F-2.

Third year; first semester; 4 credits; 4 laboratory periods a week.

F-3. Patternmaking. Continuation of E-3.

Third year; second semester; 4 credits; 4 laboratory periods a week.

G. Woodworking. This is a course in woodworking, including instruction in the care and use of bench tools. The student becomes an adept in the use of the steel square by exercises in brace and rafter cutting and roof framing, followed by lectures on various types of barn constructions. The practical work involves the construction of models of roofs, trusses, buildings, and parts of buildings reduced in scale.

Vocational course in Agriculture; first year; first semester; 2 credits; 2 laboratory periods.

J-1. Course in Forging. The purpose of this course is to teach the principles of forging as applied in the average jobbing shop. It deals with the method of building of fires so as to obtain best results in heating; care and operation of fires and forges; the use of tools in the working out of nuts, bolts, bending of eyes,

forging staples, gate hooks; bending and welding of rings and links; making of hooks, clevises, and the parts of wagons and farm machinery; the forging of tools of high carbon steel and high speed steel such as chipping chisels, lathes, sharpeners, planers, and mill tools; blacksmith's and mechanic's hammers; knives, hatchets, draw knives, and other tools.

Special attention is given to the composition of iron and the various low and high speed carbon steels; and the treatment especially adapted for each grade, to annealing, tempering, and case hardening, with some lectures on the history and production of iron.

The student will have opportunity to get practical repair work on machinery brought in from the College farm—such work as plow sharpening, wagon and machine repairing. In fact, he will come in contact with most of the work that is done in an average jobbing shop.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods.

K-1. Course in Forging. Continuation of J-1; first year; second semester; 4 credits; 4 laboratory periods.

J-2. Course in Forging. Continuation of K-1; second year; first semester; 4 credits; 4 laboratory periods.

K-2. Course in Forging. Continuation of J-2; second year; second semester; 4 credits; 4 laboratory periods.

J-3. Course in Forging. Continuation of K-2; third year; first semester; 4 credits; 4 laboratory periods.

K-3. Course in Forging. Continuation of J-3; third year; second semester; 4 credits; 4 laboratory periods.

L. Blacksmithing. The student enters upon work having direct application to farming, such as the making and mending of farm implements, chains, clevises, and hooks; the ironing of whiffletrees and neck yokes; the repairing and sharpening of plows and other farm machinery. Short talks and demonstrations are given on the method of building fires so as to obtain the best results in heating, descriptions of fans and forges, the uses of tools for various forgings, and a study of the proper means of heating and treating materials to be used.

Vocational course in Agriculture; first year; second semester; 2 credits; 2 laboratory periods.

M-1. Course in Plumbing. The purpose of this course is to teach the students those things that will meet the needs of the average plumber. The work consists of instruction and practice in the care and handling of tools; in working with fittings, traps, valves, faucets, etc.; in working with sewer, soil, waste, water, and gas lines; in cutting and threading water pipe to measurements, using different fittings; in making fine and wiping solder, and in wiping upright joints; in laying out and constructing plumbing for buildings of two or more stories, including apartments and offices; in making range boiler and other hot-water connections; and in the practical uses of the soldering iron. The following subjects secure attention: joint wiping under varying conditions, sewer pipe laying, farm plumbing with the use of septic tanks, water supply systems, plumbing without the use of lead, sheet lead working, and estimating of plumbing construction.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods.

N-1. Course in Plumbing. Continuation of M-1.

First year; second semester; 4 credits; 4 laboratory periods.

M-2. Course in Plumbing. Continuation of N-1.

Second year; first semester; 4 credits; 4 laboratory periods.

N-2. Course in Plumbing. Continuation of M-2.

Second year; second semester; 4 credits; 4 laboratory periods.

M-3. Course in Plumbing. Continuation of N-2.

Third year; first semester; 4 credits; 4 laboratory periods.

N-3. Course in Plumbing. Continuation of M-3.

Third year; second semester; 4 credits; 4 laboratory periods.

P-1. Foundry. In the foundry course, the importance of foundry practice in the industrial trades is fully recognized. Modern practices and methods, as carried out in the best commercial foundries, are closely followed. The work is varied and is such as to keep students alive with interest and to tax their ability enough to make them think. The course comprises the following: definition and names of tools, characteristics of molding sands, use and care of tools and flasks. The first exercises are intended to familiarize the student with the proper molding condition of the sand and the correct use of the hammer and other tools. A variety of forms add interest to the work and present progressively the problems of joints, parting lines, follow boards, match plates, gates for molds, pouring basins and shrinkage gates. The pat-

terns in general use are those for the numerous machine projects under development in the Industrial Arts department. Among other things, the student is given work germane to supporting copes, uses of gagers, and the use of solders and how to set them; facings such as sea coal, plumbago, talc, charcoal, and the preparation of facing mixtures; molding with good patterns broken castings, skeleton patterns; sweeps; molding of sheaves, pulleys, manhole covers, and rings; brackets; gas engine cylinders; lathe beds, in open sand and pit work, are emphasized. In core making are given materials of core making, core mixtures, uses of core boxes, sweeps, core arbors, and core rods, provisions for setting large cores by hand and with crane, methods of venting, core baking, and the painting of cores.

In cupola management the student becomes proficient in preparing the cupola, in charging and pouring off.

The work also includes practice in making castings in brass, bronze, and aluminum, and the making of alloys. Additional lectures are given on malleable castings, loam molding, steel founding, mixing and melting of iron, machine molding, and foundry appliances. The student is taught to keep account of the supplies and labor and be in a position to tell the cost of any article produced in the foundry, also the value of such articles as are turned out of commercial shops.

Vocational course; Mechanical Arts; first year; first semester; 4 credits; 4 laboratory periods.

Q-1. Foundry. Continuation of P-1.

First year; second semester; 4 credits; 4 laboratory periods.

P-2. Foundry. Continuation of Q-1.

Second year; first semester; 4 credits; 4 laboratory periods.

Q-2. Foundry. Continuation of P-2.

Second year; second semester; 4 credits; 4 laboratory periods.

P-3. Foundry. Continuation of Q-2.

Third year; first semester; 4 credits; 4 laboratory periods.

Q-3. Foundry. Continuation of P-3.

Third year; second semester; 4 credits; 4 laboratory periods.

T-1. Machine Shop Practice. For students who specialize in machine shop practice, there is work in chipping and filing straight and plane surfaces, filing two pieces to fit, and instruction in laying off and boring, followed by turning of various kinds of materials at different speeds and estimating of time and cost of work done

by using different methods such as with and without gauges, gigs, etc., straight and taper turning, right and left hand thread cutting, single, double, square, and cutting of rack spur bevel and worm gears. There is instruction in the use and classification of gauges, micrometers, and calipers. The advantages of the uses of taps and dies, gigs, and special tools, are taken up; as are also the methods of center squaring, straight and taper turning and fitting, outside and inside screw cutting, chucking and reaming, finishing and polishing, drill tap and mandrel grinding, tap boring, uses of milling machine; tool making, such as taps, reamers, mill cutters, and gauges.

Practical experience is acquired through the construction of machinery, such as lathes, gas engines, steam engines, emery grinders, and through general repair work of the College.

Time cards and stock of material are kept of all work, so that the matter of cost of production is given careful consideration.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods.

U-1. Machine Shop Practice. Continuation of T-1.

First year; second semester; 4 credits; 4 laboratory periods.

T-2. Machine Construction. Continuation of U-1.

Second year; first semester; 4 credits; 4 laboratory periods.

U-2. Machine Construction. Continuation of T-2.

Second year; second semester; 4 credits; 4 laboratory periods.

T-3. Tool and Jig Making. Continuation of U-2.

Third year; first semester; 4 credits; 6 laboratory periods.

U-3. Tool and Gig Making. Continuation of T-3.

Third year; second semester; 4 credits; 4 laboratory periods.

V-1. Electrical Construction and Operation. The purpose of this course is to give the student such theoretical and practical experience as necessary to make him an all round electrical worker.

The theoretical work, consisting of lectures, recitations, and laboratory work, covers the subjects of magnets and magnetism; electromagnetism; application of Ohm's Law, volt, ampere, Ohm, etc.; series and parallel circuits and measurements of resistance; a study of the underwriters rules; wiring systems; the telephone and telegraph circuits; power, measurements of power; heat loss; mil, circular mil; wire calculations; the applications of the wattmeter;

the motor and dynamo, both direct and alternating; wiring, repairing, and construction; tests of motors and generators; care of storage batteries; transformers; single- and multiple-phase circuits; and high tension transmission work. The shop work consists of making the different kinds of joints and splices; soldering; battery connections; telephone wiring, elementary and intercommunicating system; house wiring, exposed surface work, concealed, knob and cleat; flexible tubing, and conduit wiring. Wiring and installing of fixtures; repair of motors and dynamos; ignition, starting, and lighting systems on gas engines and automobiles; line work, armature winding, and commutator construction, transformer and switch board operation. The testing of alternating current generators, transformers, and alternating current machinery, both single- and polyphase, will form a part of this course.

Throughout the course, time cards and lists of material will be kept; and considerable attention will be devoted to the subject of buying of materials and to the financial side of the work.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods.

W-1. Electrical Construction and Operation. Continuation of V-1; first year; second semester; 4 credits; 4 laboratory periods.

V-2. Electrical Construction and Operation. Continuation of W-1; second year; first semester; 4 credits; 4 laboratory periods.

W-2. Electrical Construction and Operation. Continuation of V-2; second year; second semester; 4 credits; 4 laboratory periods.

V-3. Electrical Construction and Operation. Continuation of W-2; third year; first semester; 4 credits; 4 laboratory periods.

W-3. Electrical Construction and Operation. Continuation of V-3; third year; second semester; 4 credits; 4 laboratory periods.

103. Manual Training. Desinged to meet the needs of those students who desire to teach manual training in the sixth, seventh, eighth, and ninth grades of the public schools. A course in wood construction and design, including theory and practice in the proper use of tools; a study of the growth and structure of woods; shrinkage, warpage, and seasoning of timber; staining and finishing. Considerable attention is given to a study of shop methods, equipment, courses of study, and proper methods of conducting class work.

Course in Industrial Arts; freshman year; first semester; 3 credits; 3 laboratory periods.

104. Manual Training. Continuation of 103; freshman year; second semester; 3 credits; 3 laboratory periods.

105. Woodwork. This course, which is designed for Mining Engineering students, consists primarily of a series of constructive exercises in carpentry and joining, accompanied by lectures dealing with the care and use of bench tools; the use of the steel square in framing and laying out work.

After completing the first constructive exercises, the student will take up mine timbering, truss and bridge construction.

Mining Engineering; freshman year; first semester; 2 credits; 2 laboratory periods.

106. Woodwork. The purpose of this course is to give instruction in the care and use of modern woodwork benches and their equipment. Six lectures will be given in this course, each lecture followed by a practical application. Skill in the manipulation of tools cannot be obtained in this short time, but instruction and practice will be given in sharpening chisels, planes, and other edge tools; in jointing, setting, and filing handsaws.

The principal feature of this course will be the instruction and practice in the use of the steel square in brace work and rafter construction.

The course in Agriculture; freshman year; first or second semester; 1 credit; 1 laboratory period.

110. Woodwork. A course for Logging Engineering students, consisting of a series of constructive exercises in carpentry and joining, accompanied by lectures dealing with the care and use of bench tools, and the proper method of laying out work.

Logging Engineering course; freshman year; first semester; 2 credits; 2 laboratory periods.

111. Woodwork. A continuation of course 110 for Logging Engineering students. This course takes up the use of the steel square in building construction, and the design and construction of trestles, trussed roofs, and timber bridges.

Logging Engineering course; freshman year; second semester; 2 credits; 2 laboratory periods.

112. Woodwork. This course is designed for the architectural students and consists of a series of exercises in planing, sawing, and chiseling, preceded by a lecture, explaining each step in advance.

After a satisfactory working knowledge of the use of the carpenter tools has been accomplished, the practical use of the steel square in brace and detailed roof construction is taken up.

This work is to be developed through the construction of miniature frames of houses, barns, and roofs.

So far as possible, drawings furnished by the architectural department will be used in this work.

Architectural course; freshman year; either semester; 2 credits; 2 laboratory periods.

113. Woodwork. Correct use of the steel square in laying out practical carpenter work, windowsills and doorsills, bay and circular windows, steps, stairs, etc.; detailed construction of the window and door frames, sills, caps, weights, and fastenings in relation to the rough framework and the exterior and interior finish of the building are taken up.

In like manner, the construction of cornices, gutters, brackets, columns, and newel posts is taken up.

As soon as the students become familiar with the detailed construction of the above, they are assigned problems involving original design and construction.

Practice in reading plans, filling out material bills, and estimating the cost of material and labor, is a strong feature of the course.

So far as possible, drawings furnished by the architectural department are used in this work.

Elective; freshman year; first semester; 2 credits; 2 laboratory periods.

116. Cabinetwork. This course consists of the designing and construction of furniture according to the ability of the individual student. Mixing of stains, fillers, and various finishes, with their application, is a strong feature of the course.

Included in the work is a study of the design and construction of drawers and panel work, and primary upholstery.

Elective; freshman year; second semester; 2 credits; 2 laboratory periods.

131. Patternmaking. This course consists of a series of exercises in planing and chiseling to familiarize the student with the proper use of tools; of practical exercises emphasizing the necessity of draught core prints, core boxes; of exercises showing the necessary allowance for shrinkage of iron and other metals, and its

effect on different shapes and thicknesses of castings. Exercises in wood-turning are given in conjunction with lectures on the lathe, its care and management, and the care and use of turning tools. From the simple exercise the student soon advances to the construction of patterns of parts of machinery and other structures, such as pulleys, pipe fittings, valves, gear wheels, dynamo frames, gas and steam engines, lathes, emery grinders, and other pieces of machinery.

The lectures explain the correct methods of constructing the more complicated work, the principles of molding directly related to patternmaking, shrinkage of metals, kinds of lumber best suited for patternmaking, the working and twisting of woods, glue and metal fastenings, making cores and core boxes, methods of marking and storing patterns, estimating the weight of metal castings.

Course in Mechanical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods.

132. Patternmaking. This course and the following are a continuation of Patternmaking and are intended for engineering students who desire to devote further time to the subject, or for those who are engaged in the preparation of these, or construction work.

The work will consist largely in making patterns for steam and gas engines and other complicated machines.

Elective; first or second semester; 2 credits; 2 laboratory periods.

133. Patternmaking. This course is offered to students having had the equivalent of a two-credit course in patternmaking, and comprises the construction of the more complicated patterns and core boxes necessary for the building of steam and gas engines or other machine parts.

Elective; first or second semester; 1 credit; 1 laboratory period.

134. Patternmaking. Continuation of course 132.

Elective; second semester; 2 credits; 2 laboratory periods.

135. Wood Turning and Patternmaking. The principles of wood turning are taken up with reference to their application to the useful arts. This leads to patternmaking, which forms the greater part of the semester's work. One hour a week is used for shop lectures and recitations upon topics of vital importance to the work, such as selection of material, fastenings and joints, shrinkage of wood, allowance for shrinkage of metal, etc

The course in Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods.

136. Patternmaking. This is a continuation of course 135, and is intended for those who desire to obtain a more detailed knowledge of the subject. The student has opportunity to enter more fully into constructive work in patternmaking, by making patterns and core boxes for parts of machines to be built in the College shops.

Elective; junior or senior year; first or second semester; 3 credits; 3 laboratory periods.

137. Woodwork. A general course consisting of a series of constructive exercises in simple cabinet making, accompanied by lectures on the care and use of bench tools and the use of the steel square in building construction and in some elementary patternmaking consisting of patterns emphasizing the necessity for draught, core prints, core boxes, and shrinkage. Exercises in wood turning will be given in conjunction with the lathe, its care and management, and the care and use of wood-turning tools.

Course in Electrical Engineering; first or second semester; 2 credits; 2 laboratory periods.

151. Blacksmithing. The student is taught to make and manage the forge fire; to shape iron by bending, upsetting, drawing, and welding. Many useful articles are made, consisting of hooks, staples, rings, clevises, and chains.

Logging Engineering, Mechanical Engineering, Electrical Engineering, and Mining Engineering; sophomore year; first semester; 2 credits; 2 laboratory periods.

152. Toolmaking and Tempering. This course is devoted to the study of the heat treatment of steel as exemplified in making and tempering tools, springs, and other articles of steel.

Prerequisite: Course 151.

The course in Mechanical Engineering; sophomore year; second semester; 1 credit; 1 laboratory period.

The course in Logging Engineering, sophomore year; second semester; 1 credit; 1 laboratory period.

153. Blacksmithing. A course for students in Agriculture. After completing the first exercise, the student enters upon work having direct application to farming, such as the mending of farm implements, making and mending of chains, clevises, and hooks; ironing of whiffletrees and neck yokes; sharpening of tools.

Agricultural course; sophomore year; first semester; 1 credit; 1 laboratory period.

154. Blacksmithing. A continuation of course 152, for students wishing to take an entire year of blacksmithing.

Elective; sophomore year; second semester; 2 credits; 2 laboratory periods.

155. Forging. This course deals with the equipment of the blacksmith shop, and includes exercises in bending, shaping, upsetting, and welding iron. Some instruction is given also in hardening and tempering steel, and in brazing. The course is accompanied with lectures on the management of the fire, methods of construction, and shop equipment.

The course in Industrial Arts; junior year; first semester; 2 credits; 2 laboratory periods.

156. Hammered Metal Work. This course consists of hand wrought metal and enamel work, including hard and soft soldering, the formation of bowls, trays, boxes, lamp shades. The design and construction of furniture fittings.

The course in Industrial Arts; junior year; second semester; 2 credits; 2 laboratory periods.

171. Foundry Practice. This course includes a study of the foundry equipment; care and management of cupolas; mixing and melting of iron; molding in green and dry sand; preparation of cores; casting in iron and brass.

The course in Mechanical Engineering; freshman year; first semester; 2 credits; 2 laboratory periods.

173. Foundry Practice. A course in all respects equivalent to course 171.

The course in Electrical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods.

174. Foundry Practice. More comprehensive than course 171. Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods.

175. Advanced Foundry Practice. Continuation of 171 and 173. Elective; 2 credits; 3 laboratory periods.

202. Machine Shop. The work in the machine shop includes both bench and machine work. Upon first entering the shop the student is taught the principles of chipping, filing, and hand finishing. This occupies the first half of the semester. Machine work is then taken up through a series of exercises on lathe, shaper,

planer, drill press, and milling machine. One hour of the student's time is required each week in the class room to attend lectures, work problems, or prepare other work assigned by the instructor.

The courses in Mechanical and Logging Engineering; sophomore year; second semester; 1 credit; 1 laboratory period.

203. Machine Shop. A continuation of course 202 devoted to machine construction and milling machine work. Special attention is paid to economical shop methods of doing work.

The course in Mechanical Engineering; junior year; first semester; 2 credits; 2 laboratory periods.

205. Machine Shop. This and the following courses are a continuation of 203.

Mechanical Engineering course; second semester; 3 credits; 3 laboratory periods.

206. Machine Shop. A course similar to course 202, designed to meet the requirements of students in Electrical Engineering.

The course in Electrical Engineering; sophomore year; second semester; 2 credits; 2 laboratory periods.

207. Machine Shop. Continuation of 206.

Elective; Electrical Engineering students; junior year; first semester; 2 credits; 2 laboratory periods.

208. Machine Shop. This course begins with the hand processes of chiseling, filing, and polishing, which are followed by a detailed study of the lathe, drill press, planer, and shaper, taught by means of carefully planned exercises. The course includes one hour a week of lecture or recitation work to supplement the instruction given in the shop.

The course in Industrial Arts; senior year; first semester; 2 credits; 2 laboratory periods.

209. Machine Shop. A continuation of course 208 in which the student becomes familiar with the more complicated machines such as turret lathes, and milling machines. Shop methods are studied with reference to economical production. The student, as far as possible, enters upon construction of machinery and apparatus for College equipment.

The course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods.

212. Machine Shop. Similar to 202.

Elective; first semester; 2 credits; 2 laboratory periods.

213. Machine Shop. Continuation of 212.

Elective; second semester; 2 credits; 2 laboratory periods.

230. Dairy Mechanics. This course is arranged for the students of Dairy Manufactures. An attempt is made to give in a brief way through lectures and laboratory work, a knowledge of the elements of machine mechanics, plumbing, operation of motors, dynamos, gas and steam engines, electric wiring, setting of line shafting, and the operation and repair of machinery. This work is given by instructors in the plumbing and machine shops, and in the electrical and experimental engineering laboratories.

Dairy Manufactures; senior or junior year; second semester; 2 credits; 2 laboratory periods.

231. Manual Training for Elementary Grades. This course deals with the design and construction of cardboard work, weaving, basket and mat work, stencil cutting, bookbinding, and other industrial subjects such as are taught in the first six grammar grades.

Prerequisite or parallel: Course 171 Industrial Pedagogy.

Course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods.

250. Electrical Construction. Course similar to V-1; 2 credits; 2 laboratory periods. Industrial Arts; senior year; first semester.

251. Electrical Construction. Continuation of 250.

Industrial Arts course; second semester; 2 credits; 2 laboratory periods.

270. Plumbing. Course similar to M-1.

Elective; 2 credits; 2 laboratory periods; first and second semesters.

251. Electrical Construction. Continuation of 250.

Industrial Arts course; second semester; 2 credits; 2 laboratory periods.

270. Plumbing. Course similar to M-1.

Elective; 2 credits; 2 laboratory periods; first and second semesters.

301. Shop Drawing. This course is intended for those students who are specializing in Industrial Arts. In the beginning the work is devoted to the learning of the elements of drawing, the general use of the drawing instruments, lettering general constructions, methods of representation and free-hand sketching.

Considerable attention will be given to drawings of pieces of furniture and constructions in wood that may be worked out in the shops.

Industrial Arts course; first semester; 2 credits; 2 laboratory periods.

302. Shop Drawing. Continuation of 301.

Second semester; 2 credits; 2 laboratory periods.

SCHOOL OF MINES.

PROFESSOR PARKS
PROFESSOR WILLIAMS
PROFESSOR BUTLER
PROFESSOR SWARTLEY
MR. GOODSPEED

The School of Mines occupies a new, commodious, three-story and basement building especially designed for housing the lecture rooms and laboratories devoted to mining, metallurgy, ore dressing, geology, ceramics, chemical engineering, and closely allied subjects.

Four-years courses leading to the degrees of Bachelor of Science in Mining Engineering, Ceramics, and Chemical Engineering are offered; and the advanced degrees of Mining, Ceramic, and Chemical Engineer are conferred, upon the completion of the requisite amount of graduate work, as prescribed elsewhere in this catalogue.

Instruction is given by means of lectures and textbooks, supplemented by recitations, and by a great deal of work in the laboratories and field. While the more theoretical studies are not neglected, a determined effort is made to emphasize the practical application and value of all the subjects taught. For this reason, nearly fifty per cent of a student's time is spent in laboratory courses.

The first two years in all three departments are identical, and are intended to give the student a thorough comprehension of those studies basic to all branches of engineering; namely, Mathematics, Physics, Chemistry, Mechanical Drawing, Plane Surveying, and Shop Work. To these fundamental subjects are added courses in Dynamical and Structural Geology, Crystallography and Blow-pipe Analysis, and Determinative Mineralogy.

In the last two years, the student takes up the technical studies distinctive of the course pursued. This leads to considerable variation in the work of the different departments, as is indicated in the outline of courses. Statics and Dynamics, Strength of Materials, Hydraulics, and Electrical Machinery are required, however, in all of them.

At least two months employment in industrial lines closely allied to the course pursued, is a prerequisite to entrance upon the senior year.

The work in the School of Mines is so broad in nature that it

should equip a student for general engineering operations of many kinds, but particular emphasis is placed, naturally, upon preparation for those fields of activity that are concerned with the discovery, mining or quarrying, and preparation for market, of the mineral wealth with which the Northwest is so richly endowed.

GEOLOGY.

The following courses are offered:

111. Crystallography and Blowpipe Analysis. This course is intended to prepare a student for the work in Determinative Mineralogy; and only those portions of the included subjects are emphasized, which are essential for the proper understanding and determination of minerals. A very thorough drill is given in these. Instruction is imparted by lectures, textbook, and laboratory work, and individual oral quizzes. In the laboratory work in Crystallography, a student is required to become thoroughly familiar with the crystal systems and forms by studying a large number of wooden crystal models; later; he determines the forms on several hundred natural crystals by means of a pocket lens and contact goniometer. Blowpipe Analysis is a rapid and useful method of ascertaining all, or a part, of the elements present in minerals. The course offered in this subject includes practice in the use of the blowpipe and the operations ordinarily included under the term Blowpipe Analysis, experimental work upon known substances until facility in the recognition of the various tests is attained, and the analysis of a score or more of unknown substances.

Prerequisites: Chem. 100 and 101.

Sophomore year; first semester; 3 credits; 2 recitations; 3 laboratory periods.

112. Determinative Mineralogy. In this course, about one hundred and sixty important mineral species, and scores of varieties of these, are studied. Emphasis is placed throughout the course upon methods of classification of minerals involving a knowledge of the physical characteristics as shown by a visual examination and by the use of a pocketknife. Chemical and blowpipe methods are employed only to corroborate the inferences drawn from such observations. The end sought is the instantaneous recognition, in the field, of those minerals likely to be encountered in mining operations, rather than the classification of any mineral after a long series of tests in the laboratory. The

methods of instruction used in the course include lectures, textbook, and laboratory work, and individual oral quizzes. Each student is expected to determine approximately two thousand individual specimens.

Prerequisite: Geol. 111.

Sophomore year; second semester; 3 credits; 2 recitations; 3 laboratory periods.

137. Petrology. The object of this course is to familiarize a student with the characteristics of the commoner rocks in such a way as to make it possible to identify them with reasonable accuracy in the field. The methods employed are solely those applicable to hand specimens without the use of microscopic thin sections. The same methods of instruction are used as in Determinative Mineralogy, a portion of the scheduled laboratory periods being used for lecture purposes. Each student is expected to determine approximately seven hundred and fifty individual specimens.

Prerequisite: Geol. 112.

Junior year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

132. Petrography. This course deals with the optical properties of rock-forming minerals and the classification of rocks by the use of thin sections and the petrographic microscope. It is an elective course and is limited to such graduate or advanced students as are especially qualified to take it.

Prerequisite: Geol. 131.

140. General Geology. An elementary course dealing with the composition, structure, and history of the earth, and the forces or agents that have been, and still are, instrumental in producing or changing its surface configuration and internal arrangement. Several excursions may be made to places of geological interest for the purposes of illustrating points discussed in the class room.

Optional in any course; either the first or the second semester; 3 credits; 4 recitations; 1 laboratory period.

153. Dynamical and Structural Geology. A lecture course on geological courses and agents and their effects. Those structural features likely to be encountered in mining operations are emphasized and the laws governing them are given. The lectures are supplemented by numerous problems of a very practical nature, and by several field trips to neighboring points of geological interest.

Freshman year; first semester; 3 credits; 4 recitations.

155. Historical Geology. A course of lectures on the origin and history of the earth and the plants and animals that have lived thereon. An outline of invertebrate paleontology is presented, and the student is taught how to determine the age of fossiliferous rocks by means of "faunal groups" rather than by the recognition of characteristic species. A part of the scheduled recitation periods is utilized for laboratory work.

Prerequisite: Geol. 153.

Junior year; first semester; $1\frac{1}{2}$ credits; 4 recitations.

161. Forest Geology. In this course, a student is taught how to recognize the commoner ore and gangue minerals and rocks at sight. This is followed by the study of the more important structural features occurring in earth materials and the criteria of the various types of ore deposits.

Prerequisites: Chem. 100 and 101.

Required in the Forestry course; optional in all others; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

171. Agricultural Geology. This course deals with the origin and nature of soils from a geological standpoint, entirely. A study is first made of the commoner rocks, which a student is taught to classify at sight. This is followed by work on rock weathering and decay. Lectures are also given on the geology of ground waters, and on rock structures which may influence agricultural operations.

Prerequisites: Chem: 100 and 101.

Elective in the Agricultural course; junior or senior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

181. Mining Geology (Principles of Economic Geology). A lecture course dealing with the theories of ore deposition, types of ore deposits, and the criteria governing the recognition of each; data bearing on the possible impoverishment or change in the character of ore at depth; ore shoots; following ore deposits or searching for ore shoots underground; irregularities produced by faulting, folding, and intrusion; and the recovery of lost ore bodies. The work is made as practical and definite as the nature of the subjects treated will permit, and many problems and illustrations derived from actual mining operations are presented and discussed.

Prerequisite: Geol. 153 or 161 or 171.

Senior year; first semester; 3 credits; 5 recitations.

182. Economic Geology. This course deals with the origin, manner of occurrence, geological relations, and the geographical distribution of, and the factors governing the market for, all economically important metallic and non-metallic minerals and rocks. Many important mining areas are studied in detail and attempts are frequently made to apply the principles presented in Mining Geology.

Prerequisite: Geol. 181.

Senior year; second semester; 3 credits; 5 recitations.

190. Field Work in Geology and Mining. This is a six weeks' field course carried on during the summer in an area showing diversified geology and where mining operations are being actively conducted. A topographic map covering fifteen to twenty-five square miles is drawn by triangulation, traverse, stadia, and plane table methods; the various geological features are then mapped and interpreted, and geological sections drawn; all mines and prospects are carefully examined and mapped; and the economic resources are then examined in detail.

Prerequisites: The completed work of the junior year.

After the junior year, during the summer vacation. May be substituted for Practical Geology or Mining.

199. Practical Geology. All students in the School of Mines are required to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course which the student is pursuing. This must be done before the student enters upon the senior year of his college work, and evidence of the nature, quality, and sufficiency of the same will be passed upon by the proper department before credit for the work is given. While the minimum requirement is two months, it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. This is very important, as it not only increases a student's insight into the technical subjects later studied, but also teaches him to appreciate the value of such advanced work.

212. Mine Surveying and Mining Law. This course supplements that in Plane Surveying, taken in the freshman year. The methods used in underground surveying and mine mapping, in locating and patenting mineral claims, and in such geodetic and topographic surveying as a mining engineer is often called upon

to do, are studied; facility in the practical application of these methods is imparted by actual work in the field. Considerable attention is given to the solution of the many problems involving surveying which arise in mining operations; and some time is devoted to the study of the laws regulating the location, possession, and operation of mineral deposits in the United States.

Prerequisite: C. E. 201.

Junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

221. Mining Methods. This is a study of the various methods used in securing the mineral products. The subject includes methods of timbering, methods of mining, pumping, ventilation, transportation, hoisting, mine sampling and reporting, installation of machinery, and surface improvements. The subject is presented largely through lectures and directed reference work.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering.

Senior year; second semester; 3 credits; 4 recitations.

222. Mine Economics. This course takes up in detail the cost of extracting from mines, under varying conditions, gold, silver, copper, iron, and other metal ores, as well as coal.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering.

Senior year; second semester; 3 credits; 4 recitations.

223. Mine Examination and Reports. This course covers the sampling of ore bodies; the calculation of the amount of gross value of ore reserves; the valuation of ore bodies; sampling of placer deposits; sampling of coal seams; valuation of coal seams; sampling and valuation of other mineral bodies; percentage of ore recoverable; economic factors in mine valuation; mine reports and prospectuses; and the practices of prominent mining engineers throughout the world.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering.

Senior year; second semester; 1 credit; 2 recitations.

231. Power Equipment. A discussion of the sources of power, water, hydro-electric, steam, gas, and compressed air, together with their practical application to mining operations.

Senior year; second semester; 3 credits; 4 recitations.

241. Design of Mine and Mill Structures. This course covers the design of steel and wood mill and mine buildings, headframes, ore bins, and aerial tramways. In connection therewith, the covering, lighting, and ventilating of such structures is considered.

Prerequisites: M. E. 200, 201.

Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

251. Ore Dressing. A study of the principles and the various methods of ore concentration and the mechanical preparation of ores for metallurgical treatment. This includes crushing machinery, screens, stamp mills, classifiers, jigs, vanners, and tables. Processes such as amalgamation, magnetic separation, flotation, electrostatic concentration, etc., are also discussed.

Prerequisite: Geol. 112.

Junior year; second semester; 3 credits; 3 recitations; 1 laboratory period.

299. Practical Work in Mining. For a description of this course see Geol. 199, with which it is identical.

CERAMICS.

The course of instruction in Ceramics is designed to prepare young men to make intelligent search for suitable raw materials, to test them properly, and to aid in their economic exploitation and development. At the outset, therefore, ceramic students are required to take substantial courses in the basic sciences, chemistry, mathematics, physics, geology, and the preliminary engineering subjects required of other students in the School of Mines.

Work in the subjects distinctive of the course is confined to the last two years, and includes lectures and laboratory instruction and practice in the processes and methods of manufacture of ceramic wares, including, besides the commoner clay products, pottery and porcelain, and the compounding and application of glazes, enamels, cements, etc. Both the materials used and the finished articles will be studied and tested. The physical and chemical principles on which the production and value of ceramic products are based are thoroughly presented, and the student is shown that successful manufacture depends upon a thorough knowledge and constant application of these principles.

The following courses are offered:

301. Ceramic Chemistry. Analysis of clays, glasses, glazes, and silicate minerals. Chemical study of fire gases.

Prerequisites: Chemistry 301, 401.

Junior year; first semester; 3 credits; 3 laboratory periods.

303. Ceramic Raw Materials. The occurrence, properties, identification, and winning of clays and other ceramic materials.

Prerequisite: Completed work of the freshman and sophomore years.

Junior year; first semester; 3 credits; 3 recitations; 3 laboratory periods.

310. Raw Materials Testing. Continuation of the laboratory work of Ceramics 303. Lectures at intervals as required.

Prerequisites: Ceramics 303 and Chem. Eng. 471.

Junior year; second semester; 2 credits; 2 laboratory periods.

312. Ceramic Calculations. Calculations involved in the blending of raw materials for pottery bodies, glazes, etc. Practical ceramic problems.

Prerequisites: Ceramics 303; Chem. Eng. 471.

Junior year; second semester; 1 credit; 1 recitation.

321. Manufacture of Clay Products. Principles of the manufacture of clay wares, and the equipment used in drying and burning.

Prerequisite: Completion of the first three years of the Ceramics course.

Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods.

322. Clay Products Laboratory. Continuation of the laboratory work of Ceramics 321. Lectures at intervals as required.

Prerequisite: Ceramics 321.

Senior year; second semester; 3 credits; 3 laboratory periods.

323. Glasses, Glazes, and Enamels. Classification, production, properties, and defects. Methods of application to ceramic wares.

Prerequisites: Ceramics 303 and 312; Chem. Eng. 471.

Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods.

324. Ceramic Laboratory. Continuation of the laboratory work of Ceramics 323. Lectures at intervals as required.

Prerequisite: Ceramics 323.

Senior year; second semester; 2 credits; 2 laboratory periods.

326. Limes and Cements. Lime, cement, plaster, and other cementing materials, and sand-lime products. Production, properties, and uses.

Prerequisites: Chem. 301 and 401.

Senior year; second semester; 3 credits; 3 recitations.

328. Field Work and Report. Visits to cement, clay, and other related industrial plants; carefully written reports.

Prerequisites: Ceramics 322 and 326.

Senior year; second semester; 1 credit; 1 laboratory period.

330. Thesis. A careful study of some special ceramic problem.

Prerequisite: Completion of all ceramic courses offered before the second semester of the senior year.

Senior year; second semester; 2 credits; 2 laboratory periods.

399. Practical Work in Ceramics. For a description of this course, see Geol. 199.

With the consent of the heads of the departments interested, students may be admitted to the ceramic courses from the other departments in the School of Mines, from the School of Engineering, and the department of Art and Architecture.

CHEMICAL ENGINEERING.

This course is intended to provide the instruction and training required by young men who desire to engage in the manufacture of those substances involving chemical processes and manipulations in their production.

Industries of this nature are so numerous and various that it is impossible to familiarize a student with all of them. The course is accordingly so presented as to give in the first half of the course a thorough knowledge of all the fundamental engineering subjects and chemical processes, while the latter half of the course is largely elective. This enables a student to specialize along chosen branches of chemical activity.

Throughout the work in this department, special attention is given to those industries that already exist in Oregon, or that must be put into operation if the resources of the State are to be properly developed.

The following courses are offered:

401. Fire Assaying. The work of this course includes the crushing and sampling of ores and their assay for gold, silver, and

lead; also the assay of various metallurgical products such as bullion, matte, etc. Special attention is given to the principles of the subject, which is treated from a scientific and rational point of view, rather than by "rule of thumb." Each student is required to make a large number of assays upon previously sampled and assayed pulps, and to learn to check these within very close limits.

Prerequisites: Chem. 301, 401; Geol. 112.

Junior year of Mining Engineering course; first semester; 3 credits; 1 recitation; 2 half days in the laboratory.

411. General Metallurgy. A study of metallurgical principles and processes and of such industrial materials as fuels, refractories, slags, etc., from a quantitative physical and chemical standpoint. Different kinds of pyrometers and calorimeters are studied; various fuels are compared; furnace materials and designs are taken up in detail; and enough problems are given to enable a student to solve all ordinary metallurgical computations.

Prerequisites: Chem. 301 and 401; Physics 101 and 102.

Junior year of the Mining Engineering and Ceramics courses; first semester; $2\frac{1}{2}$ credits; 4 recitations.

412. Metallurgy of Lead and Copper. This course comprises a detailed study of the furnaces, appliances, operations, and materials used in the extraction of these metals from their ores, and in refining them. Particular attention is given to the important principles underlying these processes.

Prerequisite: Chem. Eng. 411.

Senior year of Mining Engineering course; first semester; 3 credits; 4 recitations.

421. Cyanidation of Ores. This is a detailed study of the cyanide process of extracting gold and silver from ores. The chemical principles involved in solution and precipitation are first mastered; then the operations and many mechanical devices in use are studied. Catalogues of leading manufacturers are freely used to illustrate the latest appliances.

Prerequisites: Chem. 301; Chem. Eng. 401.

Senior year of Mining Engineering course; first semester; 3 credits; 4 recitations.

423. Metallurgical Laboratory. Each student in this course determines by laboratory tests the fitness of a given ore for cyanide treatment; ascertains the percentage of extraction by various

methods; and finally, studies costs and selects the process that should give the greatest net returns.

Prerequisite: Must be taken in conjunction with, or after the completion of, Chem. Eng. 421.

Senior year of Mining Engineering course; first semester; 2 credits; 2 laboratory periods.

431. Chemical and Metallurgical Processes. A course of lectures supplemented by laboratory study of the general operations common to many industries, such as crushing, grinding, lixivation, filtration, evaporation, distillation, crystallization, etc., as well as the details of the various types of apparatus used for carrying on these processes.

Prerequisites: Chem. 301, 401.

Junior year; first semester; 3 credits; 4 recitations; 1 laboratory period.

442. Electro-Metallurgy. This is a laboratory and lecture course in which are studied the principles and processes involved in those industries which require the use of the electric current in producing and refining metals.

Prerequisite: Chem. 406.

Senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

452. Thermo-Chemistry. A continuation of Physical Chemistry in which the influence of temperature upon chemical reaction is studied more specifically than in the earlier course.

Prerequisite: Chem. 410.

Junior year; second semester; 4 recitations; 1 laboratory period.

461. Chemical Technology. A lecture and laboratory course in which the more important chemical industries are studied in detail. Various problems connected with such industries are worked out by the student in the laboratory.

Prerequisite: Chem. Eng. 431.

Senior year; first semester; 4 credits; 4 recitations; 2 laboratory periods.

462. Chemical Technology. A continuation of Chem. Eng. 461.

Prerequisite: Chem. Eng. 461.

Senior year; second semester; 4 credits; 4 recitations; 2 laboratory periods.

499. Practical Work in Chemical Engineering. For a description of this course, see Geol. 199.

SCHOOL OF COMMERCE.

PROFESSOR BEXELL
PROFESSOR MACPHERSON
PROFESSOR HORNER
PROFESSOR DUBACH
ASSOCIATE PROFESSOR BROWN
ASSOCIATE PROFESSOR BLANCHARD
ASSISTANT PROFESSOR MAXEY
MR. LEMON
MR. HOWARD
MISS MAGINNIS

The following courses are offered:

B. Bookkeeping. The aim of this course is to give the student a thorough foundation in the fundamental principles of bookkeeping. A comparison of single and double entry; the theory of debit and credit; changing from single to double entry bookkeeping; promissory notes, interest and discount; statements; closing a set of books; the journal, cashbook, sales book, purchase book, and bill book; drafts, bills of lading, and other legal forms receive much attention. Every phase of the work is illustrated by means of a large number of practical problems secured from various sources.

Two-years business course; both semesters; 3 credits; 1 recitation; 4 laboratory periods.

C. Bookkeeping. Continuation of Course B. The subjects of partnership, shipments, and consignments are here introduced. Elementary problems of how to handle depreciation, reserves, and accruals; the preparation, analyzing, and checking of balance sheets and financial statements; the distinction between capital and revenue; the use of controlling accounts and columnar books are carefully treated. Throughout the entire course the work is supplemented by a large number of practical problems illustrating the various subjects treated.

Two-years business course; second semester; 3 credits; 1 recitation; 4 laboratory periods.

D. Dairy Accounting. The same general course as E, except that in the last third of the course special attention will be given to the development of a system of accounts suited to the dairy business.

Dairy Vocational course; second semester; 3 credits; 4 recitations.

E. Farm Accounting and Business Methods. (a) **Bookkeeping:** Students who are not acquainted with the elements of

double entry bookkeeping will be required to work out several practice sets and master the theory of accounts before taking up farm accounting. (b) **Business Methods:** A thorough course in the essentials of business methods required on a well-managed farm. Financial accounts and statements, cost accounts and special records, business methods, business organization, business correspondence and forms; household and personal accounts.

The course in Agriculture; second semester; 3 credits; 4 recitations. This course may also be taken by correspondence.

F. Shop Accounting. A course in the theory and practice of accounting especially adapted to the shop and factory. Sufficient time is devoted to the fundamental principles of bookkeeping to familiarize the student with the use of special columns and various labor-saving devices. A special set of books adapted to the shop is then studied and prepared, making the course exceptionally practical. Besides the course in the technique of bookkeeping, considerable time is devoted to the phases of business management, such as advertising, selling, and buying.

The course in Mechanic Arts; second semester; 2 credits; 2 recitations; 1 laboratory period.

U. Penmanship. Students entering the first year are expected to have acquired a good hand in the grades, but considerable time is devoted during the first year to mastering the best form of business writing and lettering.

Two-years business course; first year; first semester; 2 credits; 2 recitations.

V. Penmanship. A continuation of Course U.

Second semester; 2 credits; 2 recitations.

W. Advanced Penmanship. Special emphasis is laid on rapid business writing, correct forms of business papers, lettering, and designing.

Two-years business course; second year; first semester; 1 credit; 1 recitation.

X. Advanced Penmanship. A continuation of Course W.

Second semester; 1 credit; 1 recitation. Required of all commercial students; elective to others.

100. Principles of Accounting. Modern accounting as practiced in the best business establishments of the country, forms the basis of the work. The use of special columns, controlling accounts and their adaptations are carefully studied. The student

becomes familiar with a great variety of labor-saving forms used in the modern business office. Labor-saving devices of all kinds are studied with a constant view to secure greater accuracy and to diminish work. A great deal of practice in retailing, wholesaling, and the preparation of financial statements is required. The practical work consists of various sets of practice books which the student prepares under the supervision of the instructor.

Prerequisite: Course C or equivalent.

Freshman year; either semester; 3 credits; 1 recitation; 4 laboratory periods.

101. Practical Accounting. (a) **Partnership Accounts:** A study of opening and closing entries; adjustment of profits and losses; consolidation of firms; changing from partnership to single proprietorship and vice versa, and the preparation of a set of books of a partnership business. (b) **Corporation Accounts:** A presentation of the theory of manufacturing bookkeeping. A set of books will be prepared illustrating corporation bookkeeping as applied to manufacturing business. (c) **Short-Accounting Systems:** A further study of the use of special column books and filing devices, with reference to the saving of time and labor in bookkeeping, as applied to modern business houses. The preparation of a set of books illustrating the principles involved is also required in this course.

Freshman year; either semester; 4 credits; 1 recitation; 5 laboratory period.

102. Accounting and Business Practice. (a) **Bank Accounting:** A thorough course in modern bank accounting and business practice. The organization of private, state, and national banks, trust companies, and other financial institutions. (b) **Business Practice:** The business practice course is designed to supplement all the theoretical courses and to develop initiative and originality. The offices are thoroughly equipped with modern labor-saving appliances, such as filing devices, loose-leaf books, adding machines, duplicating devices, etc.

Prerequisite: Course 101.

Sophomore year; first semester; 4 credits; 2 recitations; 3 laboratory periods.

103. Accounting and Business Practice. This course covers the broader economic phases of accounting. Emphasis is laid on accounts as a means of administrative control and economy of production.

(a) **Factory Costs.** A system of accounts and records especially adapted to a manufacturing business with a considerable pay-roll.

(b) **Farm Cost Accounts.** A system of cost accounts adapted to the farm or any productive enterprise.

(c) **Business Practice.** A continuation of Course 102.

Sophomore year; second semester; 4 credits; 2 recitations; 3 laboratory periods.

105. Accounting Problems. In the efficient administration of a business of some magnitude, the accounting department is of first importance. In it, difficult problems arise, which require not only accounting skill, but judgment and executive ability. This course covers a large variety of practical problems viewed from the standpoint of the manager rather than the accountant. The material is drawn from certified public accountancy examinations and other sources. The student does not follow any prescribed form of treatment or solution, but is expected to develop analytical initiative, resourcefulness, and originality.

Prerequisite: Course 104.

Elective; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. (Given alternate years, beginning 1915-16.)

106. Public Accounting and Auditing. (a) **Public Accounting:** This course embraces a study of accountancy as a profession; the C. P. A. laws of the various states are studied and compared; an analysis and interpretation of accounts and financial statements; terminology and procedure in public systems form an important part of this course.

(b) **Auditing:** The duties and responsibility of the auditor; his function in the executive staff; his relation to the accounting department; different classes of audits; investigation in the conduct of utility corporations, municipalities, and public institutions. Typical audits will be studied and compared.

Prerequisite: Course 105.

Elective to students in commerce; 3 credits; 2 recitations; 2 laboratory periods. (Given alternate years, beginning 1915-16.)

107. General Accounting. An abridgment of Course 100. Open to all students except those who take course 100.

Either semester; 2 credits; 1 recitation; 2 laboratory periods.

108. Special Accounting. In this course the student is given an opportunity to apply the principles of accounting to his special

needs, the course being designed primarily for engineering students. Cost accounting, and corporation accounts and statements receive special attention.

Prerequisite: Course 107 or equivalent. Course in Electrical Engineering (elective to others); freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

109. Farm Accounting and Business Methods. (a) **Farm Accounting:** This part of the course consists of a thorough discussion of a system of accounts suited to the farm. Cost accounting is especially emphasized, with a view to determining the results of different enterprises. A knowledge of the principles of bookkeeping is required before entering upon cost accounting. Students who are not thus prepared will be required to devote extra time to make up the deficiency.

(b) **Business Methods:** The economics of business receive special attention in this part of the course. The farmer is becoming a factor in commerce and finance to be reckoned with. He often engages in business adventures outside of farming; if he aspires to success he must observe the same rules of business as a manufacturer, merchant, or banker. Business organization, principles of business management; labor efficiency; buying and selling; advertising and correct office methods receive special attention.

The course in Agriculture; sophomore year; first semester; 2 credits; 1 recitation; 1 laboratory period.

110. Business Organization and Management. (a) **Business Organization:** General nature of business organization; evolution and forms; structure and life history of typical corporations; the corporation and trust problem; public utility corporations; reorganization and receivership; blue sky laws and state control.

(b) **Parliamentary Practice:** A brief discussion of parliamentary practice and procedure as applied to corporate business.

(c) **Business Management:** This part of the course emphasizes internal organization for the purpose of securing efficiency; departmental organization and coordination; various systems of scientific management are studied and compared.

Junior year; first semester; 3 credits; 3 recitations.

111. Thesis. A research course and treatise on the organization and management of a business in which the student is especially interested. The subject of the thesis must be chosen at the

time of registration, and a complete outline approved by the professor in charge not later than November 1. When the thesis is approved, a bound (either printed or typewritten) copy must be deposited in the College library.

Prerequisite: All College courses in Business Administration. Open only to seniors.

Both semesters; 1 credit each semester.

112. Advertising and Selling. (a) **Advertising:** A study of the fundamental principles of modern advertising. Special emphasis is given to the peculiarities of composition in newspaper and circular advertising, proofreading, effectiveness of design, illustration and display, follow-up systems, etc.

(b) **General Principles of Salesmanship:** Business ethics; wholesaling and retailing; brokerage and commission; specialty selling; the sale of service; planning a selling campaign; special sales; prices; correct buying.

Junior year; second semester; 3 credits; 3 recitations.

122. Business Management for Women. The aim of this course is to treat in a practical way the ordinary rules and methods of conducting business affairs. Three distinct phases are emphasized, as follows:

(a) **Finance:** Value of money, how savings grow, banking and credit, general principles of investment, loan associations, bonds and stocks, and insurance.

(b) **Fundamentals of Business Law:** The principles of the law of contracts, of negotiable paper, mortgages, real property, landlord and tenant, descent and distribution of property, and wills.

(c) **Accounts and Business Methods:** A thorough study of household accounts and budgets; private accounts; business correspondence and forms. The preparation of a number of practical exercises is required.

Home Economics course; freshman year; second semester; 2 credits; 2 recitations.

124. Pharmacy Accounting. A course in the theory and practice of accounting, especially adapted to the drug business. Sufficient time is devoted to the fundamental principles of bookkeeping to familiarize the student with the use of special columns and various labor-saving devices. A special set of books adapted to the average drug establishment is then prepared, making the course exceptionally practical. Besides the course in the technique of

bookkeeping, considerable time is devoted to other phases of business management, such as advertising, selling, and buying.

Course in Pharmacy; second semester; alternate years; 2 credits; 1 recitation; 1 laboratory period. Will not be given in 1915-16.

130. Accounting and Management of Cooperative Enterprises.

This course covers the business management of cooperative societies. It includes such subjects as the organization of the employees; structure of buildings; office arrangement and equipment; correspondence and filing; bookkeeping and cost accounting especially adapted to different types of cooperative associations in the United States, such as creamery associations, cow-testing associations; auditing, banking, and finance; purchasing, advertising, selling; depreciation of assets; conduct of membership meetings; annual reports and audits; statistical analysis of operations. The course is based on the system published by the Cooperative Union Limited of England, adapted to American conditions.

Course in Farm Management; senior year; first semester; 3 credits; 3 recitations.

140. Business Men's Lectures. A series of lectures on practical business subjects will be given during the year by prominent business men of the State. Following is a tentative list of subjects during the present year: Present Problems in Finance; Organization of a Bank; Organization of a Railroad; Organization of a Department Store; Advertising and Selling; Buying Merchandise; The Fishing Industry of Oregon; The Lumber Industry of Oregon; The Business Side of Farming; Commercial Expansion of the United States; Duties and Responsibilities of the Public Accountant; The Industrial Manager; Duties and Responsibilities of the Bank Cashier; Education for Business; Business Opportunities in Oregon. This course is open to all students of the College. To obtain credit, complete notes must be submitted on the lectures and assigned readings, and an examination taken on the course. One lecture a week. First semester; one credit.

141. Business Men's Lectures. A continuation of Course 140. One lecture a week; second semester; one credit.

ECONOMICS.

I. Business and Social Organization. This course embodies a discussion of the principles of better business and better living that should accompany the general improvement in farm methods,

which it is the purpose of this school to promote. The general application of the economic laws of consumption, distribution, and production to the business side of farming, and the social and economic results of agricultural organization will be studied by the aid of textbook, lectures, and assigned readings.

Vocational course in Agriculture; first semester; 3 credits; 3 recitations.

J. Elementary Industrial Problems. This is a course especially designed for vocational students in industrial arts and commerce. It aims to give them some insight into the economic problems with which they will have to deal. A very condensed outline of the principal economic concepts will be followed by the discussion of industrial organization, labor problems, transportation, marketing, taxation, etc.

Vocational course in Mechanic Arts; third year; Vocational course in Commerce, second year; second semester; 3 credits; 3 recitations.

K. Elementary Industrial History. The history of industrial methods and the progress of invention is taken up from earliest times down through the English industrial revolution. Then follows a more detailed treatment of the industrial and commercial history of the United States. The evolution of industrial organization through the domestic to the factory system, the influence of these industrial changes upon the relations between capital and labor, the rise of a labor class, the opposing organizations consolidating labor and capital, problems incident to the formation of large corporations, the abuses of the trust, anti-trust legislation, etc., will be taken up with the aid of a textbook in industrial history, supplemented by lectures and the study of present day problems as outlined in the press.

Vocational course in Mechanic Arts; second year; 2 credits; both semesters; 2 recitations.

200. Commercial Geography. In this course the fundamental conditions underlying all industry and all commerce are taken up in detail. First of all such basic elements as climate and topography are investigated as they mold transportation and commerce and the production of animal and vegetable products. Then the natural resources of the different countries of the world are treated with especial emphasis upon those of the United States.

Specimens from the Commercial Museum will be used by the

students in making reports on the production and manufacture of the principal raw materials and their relation to the development of the countries from which they come. The course presupposes a fair knowledge of physical and political geography and of general history.

Freshman year; first semester; 3 credits; 3 recitations.

202. Commercial Geography. This division of the work of Commercial Geography is especially adapted to students in the Engineering courses. Along with 212, it forms a year's work, aiming to give the student an economic training especially suited to his particular field of activity.

More stress will be laid upon geographic conditions as they determine the problems of transportation and commerce. Climatic conditions and the principal raw materials will be taken up as determining the progress and localization of population and industry. The importance of these raw materials of commerce, and the supplies available in our own and other countries will be treated in detail.

Textbooks, lectures, and reports.

Engineering students; sophomore year; first semester; 3 credits; 3 recitations. Credit not given except when followed by 212.

205. History of Commerce. The beginnings of agriculture and the industrial arts in the great Asiatic river valleys of China, India, Mesopotamia, and Egypt are sketched. The origin of commerce, by which the products of these ancient civilizations were exchanged and made common property, is outlined. The commercial achievements of the Phoenicians, Greeks, and Romans, in relation to the westward progress of civilization, are taken up. The rise of modern commerce out of the chaos of medieval Europe; the Mohammedan occupation of Spain; the effects of the Crusades; the achievements of Portugal, Spain, Holland, and France, are considered. The main stress of the course will be laid upon the industrial development of Great Britain, as a basis for the study of the United States, in course 206.

Freshman year and second year of two-year Business Course; second semester; 3 credits; 3 recitations.

206. Economic History of the United States. This course follows and develops out of the previous work in Commercial Geography and the History of Commerce. On the basis of a knowledge of our natural resources and of the previous com-

mercial and economic development of the world, we attempt to outline and interpret the economic progress along many lines which has been made by the United States. The development of agriculture, the growth of manufacturing, the improvement of transportation, the history of labor organization and legislation, the evolution of our monetary and credit systems, changes in the protective tariff, etc., are traced from Colonial times onward.

Prerequisites: Commerce 200, 205.

Sophomore year; first semester; 3 credits; 3 recitations.

210. Principles of Economics. A general course covering the elementary problems of our industrial and commercial organization, including the nature of wealth, its production and consumption, and the different forms in which it is found; the conditions underlying its success in agriculture and manufacturing; the localization of industry and the relation of raw material to manufacturing; the law of diminishing returns; division of labor and efficiency in production; exchange and distribution and their dependence upon the price-making process; the factors determining prices, wages, interest and rent; the problems of taxation; public expenditures; protection and free trade; money and banking; labor problems and transportation.

Textbook, lectures, and reports on assigned readings.

Prerequisites: 200 and 206.

Sophomore year; second semester; 3 credits; 3 recitations.

211. Principles of Economics. A course especially adapted for students in Home Economics. Not open to Commerce students.

Textbook and lectures. Junior year; first semester; 2 credits; 3 recitations.

212. Principles of Economics. This course forms a continuous year's work in Commercial Geography 202. In this division the elementary principles will be covered in a brief outline and the student will then take up, by means of lectures and selected readings, such problems as are especially important from the viewpoint of engineering students. Such problems are the nature, organization, and claims of trades unionism; the special problems of labor management from the standpoint of the employer; the economic problems of transportation, and a discussion of the modern trust movement, with attempts at legislative control. Textbook,

lectures, and reports. Not open to Commerce students; must be taken in connection with Commerce 202.

Engineering students; sophomore year; second semester; 3 credits; 3 recitations.

213. Labor Problems. This course begins with a brief historical review of the rise of a labor class. The influence of occupation upon the laborer; and the different types of labor and the problems involved in the occupations represented by the several technical departments of the College, will be studied. Then follows the beginnings of organization; the structure, aims, methods of offence and defence, and achievements of associations of labor. The trade agreement, the strike, the boycott, the lockout, methods of conciliation and arbitration, the application of the injunction in labor disputes, the political activity of labor organizations, employers' liability, legislation, workmen's insurance, profit sharing and cooperation in relation to labor problems, will be taken up with the aid of a textbook, lecture, and assigned readings. Studies will be made of typical, historical and current labor disputes and embodied in term papers and class discussion.

Prerequisite: Commerce 210.

Sophomore or junior year; second semester; 3 credits; 3 recitations.

219. Agricultural Economics. The fundamental principles of production, distribution, and consumption are taken up with especial reference to agriculture. The aim of the course is to acquaint the student with the laws of supply and demand and the influences determining them. A brief history of agricultural production is taken up, showing the growing complexity of the economic problems of taxation, transportation, marketing, etc., as the transition is made from self-sufficing, general farming to localized, commercial agriculture.

Textbooks and lectures; junior year; first semester; 3 credits; 3 recitations.

230. Money and Banking. (a) **Money:** The nature and functions of money, legal tender, Gresham's law, coinage; the factors affecting prices, and their relation to business conditions; a brief history of the various forms of paper currency; silver legislation; present problems and conditions.

(b) **Banking:** Procedure in organizing state and national banks; history of banking, including our National Banking System

as modified by the Federal Reserve Bank Act of 1913; the functions of banks; the preparation and analysis of bank statements; loans and the granting of credit, securities required; rediscount; duties of the various bank officers; legal principles of banking; the principles underlying foreign exchange; a comparison of our banking system with that of foreign countries. Textbook, lectures, assigned readings, and reports.

Prerequisite: Commerce 210.

Junior year; first semester; 3 credits; 3 recitations.

233. Public Finance. An examination will be made of public expenditures, local, state and national. For this purpose, typical financial budgets and reports will be analyzed. A history of reforms calculated to secure efficiency in these expenditures will be sketched. The various forms of taxes, customs, and fees whereby revenues are raised, will be taken up in detail and their apportionment studied in relation to the budgets previously analyzed. Present systems of land taxation will be studied in the light of proposed reforms. An attempt will be made to give the student some laboratory practice through the study of local systems of assessment and the resulting apportionment of taxes.

Senior year; first semester; 3 credits; 3 recitations.

235. Insurance. A course designed to cover, in a general way, the whole field of insurance. The nature and statistical basis of different kinds of insurance will be first treated. Then the application of the principles discovered to different forms of insurance, such as straight life, endowment, accident, industrial, old age, fire, live stock, hail, etc., will be taken up in detail. Text, lectures, and library work.

Elective; junior or senior year; second semester; 3 credits; 3 recitations.

240. Transportation. The relation of transportation systems to industrial and commercial progress; a brief historical review of the development of systems of transportation; the organization and financing of different systems; the effects of competition in the railroad business; freight classification, and the making of rates and fares; the necessity of government control, and attempts at regulation by state and federal governments; government ownership in the light of European experience. Text, lectures, and assigned readings.

Senior year; second semester; 3 credits; 3 recitations.

250. Practical Sociology. In this course, social theory will be subordinated to the study of practical social problems. The different social and political units, such as the family, school, church, club, city, state, and nation will be discussed in their relation to the general welfare. This will necessitate an examination of the organization, purpose, and methods of each of these functional groups, involving a discussion of the training of children, employment of women and children, marriage and divorce; the labor movement as a factor in the struggle for existence; overcrowding in city slums, and its amelioration; the causes of pauperism, immorality, and crime, with modern methods of their treatment, etc. A good general textbook will be studied and the whole field covered in class discussion and assigned readings.

Sophomore year; second semester; 3 credits; 3 recitations.

251. Practical Sociology. Course 250 especially adapted for students in Home Economics. Not open to students of Commerce. Textbook and lectures.

Junior year; second semester; 2 credits; 3 recitations.

252. Rural Sociology. This course will deal with the special problems of the rural family, the rural school, the rural church, rural societies and associations, and the relation of the State to the general rural welfare. This will involve an inquiry into the prevailing ideals of the rural community regarding labor and leisure; art, literature, and music; and the necessity for recreation. Recent progress in adapting education to rural needs will be discussed. City over-crowding will be examined from the rural point of view, and the lessons which the rural community can learn from the progress made by cities in solving their problems, will be emphasized. The social and educational effects of the telephone, free mail delivery, rural press, and improved methods of agricultural production and exchange, will be discussed in detail. The best textbooks in the field will be carefully studied, and the whole ground covered in class discussion and assigned readings.

Elective for juniors and seniors in Agriculture and for such juniors and seniors in Domestic Science as may prefer this course to the one in Practical Sociology; second semester; 3 credits; 3 recitations.

254. National Vitality. A one credit course, covering the general field of national vitality, its importance, the conditions underlying it and the means of maintaining such conditions. The eco-

nomic and social waste due to disease, alcohol, and vice will be treated in a series of lectures by experts from different departments of the College. Outside specialists will also be secured to lecture upon particular phases of the subject. Besides taking notes on the lectures, each student will be required to make an abstract of not less than three hundred pages of assigned readings.

Elective for all students; first semester; 1 credit; 1 recitation.

255. The Literature and Exposition of Rural Life. A critical study will be made of the general field of literature bearing upon rural life. Typical interpretations of rural life will be taken from the best poetry and prose. The rural press will be studied with a view to estimating its sociological and economic influence. Themes will be prepared upon current economic and sociological topics and the subject matter discussed in the class room to familiarize the student with the problems involved in the Rural Life movement.

Required of seniors in Farm Business and Rural Leadership; elective for other senior students. First semester; 3 credits; 3 recitations.

260. Cooperation. This course takes up the origin and development of the cooperative movement in Europe, and its introduction into the United States. It sets forth the general principles underlying the economic and social activities of cooperative associations. Then, following this, the different types of organization, the methods by which they are formed, their working plans in different enterprises, and the factors which determine their success or failure, will be studied in detail. The store, the factory, the dairy and cow-testing association, the credit organization, etc., will be taken up systematically, and the advantages and difficulties of cooperation will in each case receive careful analysis.

Elective for juniors and seniors who cannot take 264 and 265, and who have had considerable training in political economy; junior or senior year; second semester; 3 credits; 3 recitations.

264. The Economic Organization of Agriculture. This course, together with 265, is designed to give a more specialized training in the economic problems of agriculture than is possible in the general course outlined under 219.

In both courses, 264 and 265, economic problems are discussed from the standpoint of the efficiency to be attained through closer organization. Existing associations of farmers both in this country

and in Europe will be carefully studied by means of sample constitutions and by-laws, and also by lantern-slide illustrations of the work actually being accomplished through cooperation in Europe and America. The aim is to turn out men trained to play their part in the revolution in agricultural business methods which is now sweeping over this country.

(a) **Economic Problems of Production and Marketing:** Old methods and their weakness are examined, and the possible savings through organized business are investigated.

(b) **The Purchase of Farm Supplies:** The purchasing end of the farm business is about as important as the selling of farm products. Present methods will be taken up in detail, and the possibility of eliminating waste and duplication thoroughly discussed and illustrated.

(c) **The Problems of Transportation as Affecting the Farmer:** The economic significance of the good roads movement will be dealt with; systems of rail and water transportation will be taken up, government control discussed, and the possibility of eliminating waste through precautions on the part of the shippers pointed out.

Open to all who have had 219 or its equivalent; junior year; first semester; 3 credits; 3 recitations.

265. Rural Finance. (a) **Rural Credit.** The principles of money, credit, and banking will be sufficiently studied to lay the foundation for the examination of the credit needs of the rural communities, and the most economical means of satisfying them. The reasons why farmers have been so poorly served by existing credit institutions will be investigated. The credit institutions of Europe will be compared with those of the United States; the development of cooperative credit in European countries will be carefully studied, and the present widespread movement to adapt cooperative credit institutions to American rural conditions will be closely followed.

(b) **Rural Insurance.** The basis of insurance of different kinds will be taken up, and applied to agricultural needs; old line, mutual, and fraternal organizations will be examined from the standpoints of efficiency and safety.

(c) **Rural Taxation.** The general principles of public finance will be taken up in so far as may be necessary to lay the foundation

for an intelligent discussion of rural taxation; existing systems, as well as proposed reforms, will be examined.

Open to all who have had 219 or its equivalent; junior year; second semester; 3 credits; 3 recitations.

270. Problem Course. Students especially interested in Applied Economics may select some problem within the scope of the work characteristic of the College, and under the direction of the instructor in charge prepare a thesis embodying the results of an investigation made during the senior year.

Senior year; both semesters; consultation by appointment; 1 credit each semester.

280. The Economics of Distribution. A seminar covering the whole subject of the distribution of wealth, preparatory to graduate and thesis work in Agricultural Economics and Rural Sociology.

Open to graduate students who have had 219, 264, and 265 or an equivalent training. First semester; 3 credits. Credit not given for one semester's work.

281. Continuation of Course 280. This course is required in order to receive credit for first semester's work.

Second semester; 3 credits.

283. Markets and Marketing. The development of marketing systems; the study of local, state, and national commercial programs and policies; commercial clubs, boards of trade, chambers of commerce, speculation organized and unorganized; foreign trade relations, the consular service, commercial treaties, tariffs, bounties, and foreign exchange.

Open to graduate students who have had Com. 280. First semester; 3 credits; credit not given for one semester's work.

284. Continuation of Course 283. This course is required in order to receive credit for first semester's work.

Second semester; 3 credits.

POLITICAL SCIENCE.

L. Commercial Law. Adapted to students of limited training. A course covering the general principles of contracts, and particular contracts including sales of goods, bailment, insurance, credits, loans, negotiable instruments, agency, partnership, corporations, and property.

Two-years Business course; second year; and Mechanical Arts; third year; first semester; 3 credits; 3 recitations.

N. Civil Government and Administration. (a) **Civil Government:** Our European ancestors; origin of states and state institutions. English and American governments compared; federal and state constitutions; state and foreign service; the executive departments; federal and state power; political parties and issues.

(b) **Federal and State Administration:** A survey of the administrative activities of federal, state, and municipal governments; governments from the sociological point of view. The financial operations, preparation of budgets and reports, will be considered.

Two-years Business course; first year; second semester; 3 credits; 3 recitations.

300. Advanced Commercial Law. (a) **Contracts in General:** Formation of contracts, offer, acceptance, form, and consideration; competence of parties, consent, and legality of subject matter; operation of contracts, including limit of obligations and assignments; interpretation, rules of evidence, and construction; discharge of contracts; the agreement, performance, breach of contract, etc.

(b) **Negotiable Instruments:** Maker's, acceptor's, drawer's and indorser's contracts; proceedings before, upon, and after dishonor; proceedings in protesting; accommodation paper; grantor and surety; holder's position, defense, equities, agency, insurance, etc.

Sophomore year; first semester; 3 credits; 3 recitations.

301. Advanced Commercial Law. (c) **Partnership Law:** Formation of partnerships, essentials, liabilities of members, capital, profits, good will, individual and firm property; agency for partners; dissolution winding up; priority of distribution, etc.

(d) **Corporation Law:** Kinds, formation, powers, liabilities, ownership, shares, subscription, calls, notice, transfers, management, officers, directors, contractional powers, dividends, dissolution, are discussed fully from the legal point of view.

(e) **Property:** Classes, method of acquiring and transferring titles, mortgages, lease, landlord and tenant, etc. The case method is used throughout the entire course. Lectures, reports, and discussions.

Sophomore year; second semester; 3 credits; 3 recitations.

302. International Relations. Persons concerned, rights and duties of states; territorial jurisdiction; jurisdiction on the high seas; agents of the state treaties; settlements of disputes; war and

its effects; military occupation; neutrality, contraband, blockades, etc. Lectures, reports, and discussions.

Senior year; first semester; 3 credits; 3 recitations.

304. Advanced American Government. This course will supplement courses 320 and 322 giving chief attention to the interpretation of our federal and state constitutions, and the relation of legislation to these constitutions. Court reports will be used liberally with a view to showing the interpretation of the rights of the people guaranteed in our constitutions and of the powers granted to the government by these instruments. Course 320 is prerequisite.

Elective; junior or senior year; first semester; 3 credits; 3 recitations.

306. Commercial Law. A short course in the laws of business. Recitations and discussions.

Pharmacy and Farm Management students.

Second semester; 3 credits; 3 recitations.

320. National Government. (a) **National Government:** The Constitution; rise of the American Union; distribution and powers of the Government; powers of Congress; powers of the executive; the judicial departments; checks and balances of governments; governments of territories and colonies; admission of new states; amendments to the Constitution; civil rights and their guarantees; protection of persons accused of crimes; protection of contracts and property, etc. Lectures, readings, reports, and discussions.

(b) **American Politics:** Origin of political parties in the United States; changes, growth, and development; party platforms.

For juniors and seniors; first semester; 3 credits; 3 recitations.

322. State and Municipal Government. A study of the functions of state government; the machinery of state government; political parties in state government; special study of the government of the State of Oregon; municipal government, including county, town, and city government.

Lectures, readings, reports, and discussions.

For juniors and seniors; second semester; 3 credits; 3 recitations.

325. Comparative Governments. A critical study of the governments of the principal countries of the world, with special em-

phasis on modern movements and features of government, that are problems in the United States at present.

Lectures, reports, and discussions.

Senior year; second semester; 3 credits; 3 recitations.

326. Practical Legislation. The work in Advanced American Government would serve as a preparation for this course which will instruct in practical bill drafting. Attention will be given to the correct form, and the correct expression of the desired content of bills. Emphasis will be placed on the necessity of preparing laws with reference to prior legislation and court decisions. In addition, an attempt will be made to show the necessity of studying conditions, and the possibility of guiding legislation to meet the demands of the times. Special emphasis will be placed on rural and industrial legislation. Course 304 is prerequisite.

Elective; junior or senior year; second semester; 3 credits; 3 recitations.

STENOGRAPHY AND OFFICE TRAINING.

400. Elementary Stenography and Typewriting. (a) **Gregg Shorthand:** Theory manual covered thoroughly. Shorthand penmanship given special attention. Dictating machines used in preparation of assignments for class work. Primary, Intermediate, and Complete certificates granted.

(b) **Rational Typewriting.*** The theory and practice of touch typewriting, covering mastery of the alphabet, numerals, mechanical arrangement of business correspondence and legal forms, tabulating, and speed practice. Special attention is given to the mechanics of the typewriter.

Degree course; sophomore year, and Vocational course; first year; either semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each.

401. Elementary Stenography and Typewriting. A continuation of course 400. Speed practice finished through the principal series and phrase letters. Elementary office equipment studied and used. Typewriting Speed certificates granted.

*By special permission of instructor, 400 (b), Typewriting, may be omitted, with a reduction of one credit. This applies particularly to students of schools other than Commerce.

Commerce students starting Stenography, having had previous training in typewriting, will not be excused from 400 (b); budgets of an advanced character will be assigned them. Credit will not be given for first semester's work in stenography, unless the course is carried the full year.

Degree course; sophomore year; and Vocational course; first year; either semester; 4 credits; 4 recitation periods; 4 laboratory periods.

402. Advanced Stenography and Typewriting. Dictation covering vocabularies of representative business, such as real estate, law and collections, banking and financial, life and fraternal insurance, publishing, railway, manufacturing, civil service. The typewriting periods will be taken up with transcription of dictation. 80, 100, and 120, word speed certificates granted.

Course 412 must be taken concurrently with this course by Commerce students.

Degree course; junior year; and Vocational course; second year; first semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each.

403. Advanced Stenography and Typewriting. A continuation of course 402. Court and lecture reporting introduced. Course 413 must be taken concurrently with this course by Commerce students.

Degree course; junior year; and Vocational course; second year; second semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each.

404. Expert Speed Course. Designed for those having finished course 403 and desiring to specialize in court or convention reporting.

Elective; senior year; first semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each.

410. Typewriting and Office Training. Designed especially for students not enrolled in Stenography, but who desire a knowledge of Typewriting and Office Appliances. (a) **Typewriting:** Covering the same ground as course 400-b. Not open to stenography students.

(b) **General Office Methods:** Office records and systems, relation between employer and employee; office equipment and its efficient arrangement. Especial attention will be given to training students in office methods that apply to their particular branch of work.

Elective, all courses; either semester; 2 credits; 4 laboratory periods.

411. Typewriting and Office Training. Continuation of 410. Not open to Stenography students.

Elective, all courses; either semester; 2 credits; 4 laboratory periods.

412. Office Training for Stenographers. Designed to give such knowledge and training as is called by employers, "experience." This course is so arranged that it is an integral part of course 402, Advanced Stenography and Typewriting. Topics covered: Attractive arrangement of business letters; applying for a position; office routine; inclosures, remittances, and banking; filing systems; office appliances; shipping information; business ethics and bibliography; legal papers and transactions; telegraph and telephone; printing and proofreading; a day's work coordinated into an organized whole.

Junior year; first semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each. Required of all taking course 402.

413. Secretarial Training for Stenographers. Continuation of course 412. Actual service in the College administrative offices required. Office efficiency problems studied.

Junior year; second semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each. Required of all taking course 403.

414. Bibliography. Advanced library training for secretaries and others, in order that they may know where and how to find quickly all information regarding any important field of knowledge. Method of indexing books and general filing. Twelve lectures and problems will be given by experts in the various fields, covering the main principles, chief authorities, and the sources of material.

Dewey Decimal Classification: 3 lectures and problems by the College Librarian. Subject Headings: three lectures and problems by the College Cataloguer.

Elective; junior year; second semester; 1 credit; 1 lecture.

PHARMACY.

PROFESSOR ZIEFLE
MR. BETZEL

The following descriptions are for the strictly pharmacy subjects; all courses in pharmaceutical chemistry are outlined in the chemistry schedule.

102. Elementary Pharmacy. This course deals with: history of pharmacy and its development, standard pharmaceutical literature, demonstration of apparatus, and all other elementary phases of pharmacy. The aim of the course is to give new students an idea of the subject by showing the relation of the various scientific courses in the pharmacy curriculum to each other.

Freshman year; first semester; 1 credit; 1 lecture.

103. Elementary Pharmacy. A continuation of course 102 but deals with more advanced subjects in preparation for the courses in Pharmaceutical Latin and Theoretical Pharmacy.

Freshman year; first semester; 1 credit; 1 lecture.

104. Pharmaceutical Latin. Latin is the language of science and all properly trained pharmacists need some knowledge of the principles of Latin etymology and construction in order to understand the use and terminology of pharmacy and medicine. The following subjects are made the basis of systematic study in this course: Latin abbreviations as used by physicians, Latin endings of drugs and medicines, prescription Latin, and English translation of all Latin terms used in pharmacy.

Sophomore year; first semester; 2 credits; 2 recitations.

114. United States Pharmacopeia and National Formulary. The object of this course is to apply the principles of all fundamental scientific courses such as, chemistry, materia medica, pharmacognosy, etc., to the subject of pharmacy. The Pharmacopoeias, Dispensatories and National Formulary are the text books used, and students are required to become very well informed as to the composition, uses, and methods of preparation of all official and unofficial remedies, as well as those newer remedies that are used most frequently. All strictly pharmacy courses are reviewed in preparation for the State Board of Pharmacy examination. Several intermediate examinations will be held, and the instructors will thus be enabled, by returning proper suggestions and directions, to aid students materially in equipping themselves for any pharm-

acy examination. Typical representative State Board questions will be used as a guide in preparing for the examination. There will be frequent reviews in identification of drugs and their preparations, as well as the careful systematization of all pharmacy subjects to permit of frequent reviews.

Senior year; first semester; 3 credits; 3 recitations.

115. United States Pharmacopoeia and National Formulary.

This is a continuation of course 114. As a special feature of the work, however, all scientific journals and state bulletins are reviewed, in order to familiarize students with the trend of State and National Pure Food and Drug work, as well as the various laws regulating the sale of drugs. The newer remedies are studied from the point of view of their composition, use, and incompatibilities. Other subjects of equal importance are discussed, the aim of the work being to prepare students for the actual needs in pharmacy.

Senior year; second semester; 3 credits; 3 recitations.

116. Theoretical Pharmacy. This course will begin with lectures defining pharmacy and allied sciences, and will embrace a study of the nomenclature of Pharmacopoeias and their importance as standards for drugs. Then will follow in order, lectures and demonstrations dealing with the principal processes employed in operative pharmacy; viz., weights and measures, heat, distillation, sublimation, extraction in its various forms, and other methods used in the manufacture of galenical preparations.

Junior year; first semester; 3 credits; 3 recitations.

117. Practical Pharmacy. The natural products used in pharmacy are carefully defined and demonstrated. Then follows a study of the various classes of preparations such as: waters, syrups, tinctures, extracts, etc. Each class is defined and the various methods used in their preparation are illustrated and discussed. All preparations of the U. S. Pharmacopoeia are studied, particular attention being given to their constituents, percentage strength, method of preparation and reasons for each step, equations and synonyms.

Junior year; second semester; 3 credits; 3 recitations.

118. Pharmaceutical Preparations. The object of this course is to teach students to put into practice the principles of Theoretical Pharmacy. While the student's work is individual, constant supervision of the instructor prevents inaccuracies and error

in conception, and in this way wrong methods can be corrected. The work will embrace the determination of specific gravities by various methods, comparison of weights and measures, standardization of graduates and the tying and wrapping of carefully weighed packages. The main feature of the course, however, is accurately to prepare small amounts of the simpler preparations such as: waters, liquors, emulsions, pills, suppositories, etc.

The galenicals made are carefully inspected and at definite times identification examinations are held, at which time students are required to identify all preparations made and all ingredients used in their manufacture.

Junior year; second semester; 2 credits; 2 three-hour laboratory periods.

121. Inorganic Pharmacy. This course deals with a study of official and unofficial inorganic drugs. The lecture work consists of a study of the elements and their compounds that are used in medicine. Their source, method of preparation, formulae, synonyms, physical and chemical characteristics are made the basis of systematic study. In the laboratory representative samples of each type of chemical will be made and samples of all official inorganic drugs will be supplied to each student for identification study.

Junior year; first semester; 3 credits; two lectures and two two-hour laboratory periods.

123. Pharmaceutical Calculations. The various forms of calculations that are common to pharmacy are made the subject of systematic study; viz., Equivalents of each system of weights and measures, calculation of proportionate parts of a formula, percentage solutions, specific gravity, alligation, and such chemical calculations as are met with in pharmacy.

Junior year; second semester; 2 credits; 2 recitations.

130. Pharmacognosy. This course deals with the microscopical examination and study of official and unofficial animal and vegetable drugs. All drugs are properly classified in respect to their habitat, botanical order, constituent, synonyms, medicinal uses, and preservation. Frequent identification examinations are given so that students must become thoroughly familiar with the physical characters of drugs as well as their use.

Junior year; first semester; 3 credits; 3 recitations.

131. Pharmacognosy. A continuation of course 130 and the use of typical State Board of Pharmacy questions to supplement the work in preparing to become registered pharmacists. A special feature of the work of this course is the instruction of growing drugs on a commercial scale. Lectures and demonstrations will be given on preparation of soil, planting of seed, the care of drug plants, collection and preparation for market.

Junior year; second semester; 2 credits; 2 recitations.

140. Materia Medica and Toxicology. Lectures and recitations on the properties, physiological actions, uses, and doses of all chemical, animal, and vegetable drugs, and their preparations. The different types of drugs are studied in groups according to their physiological action. The peculiar terms used to classify drugs according to their action and uses are carefully defined. The subject of toxicology receives especial attention from the point of view of absorption, elimination, and cumulative action of poisonous substances. The signs and symptoms are studied in each case, and the antidote and medicinal treatment receive attention.

Senior year; first semester; 3 credits; 3 recitations.

141. Materia Medica and Toxicology. A continuation of course 140. After the entire subject has been covered, preparation for the State Board of Pharmacy examination and the practical use of the subject follows. Each student will be required to familiarize himself with State pharmacy and drug laws, as well as other laws that regulate the manufacture and sale of drugs. The latter part of the course consists of lectures and laboratory work on First Aid to the Injured. Pharmaceutical jurisprudence is considered from the point of view of the trend of recent legislation affecting pharmacists, legal limits of pharmacy, liability of the seller of drugs, expert witness and all other phases of this subject.

Senior year; second semester; 3 credits; 3 recitations.

150. Prescription Lectures. This course deals with the technical study of all phases of the prescription. It embraces particularly the very important subject of pharmaceutical, chemical, and therapeutical incompatibilities. The aim of the course is to give such theoretical instruction as will enable the student to devise the best method of compounding prescriptions in order that the mixture will be safe and represent what the physician wants.

Each class of prescriptions is studied, particular attention being given to the art of preparing elegant remedies. Ambiguous prescriptions are read in class, and the question of overdose of such drugs that might prove to be poisonous is also studied.

Senior year; first semester; 3 credits; 3 recitations.

151. Prescription Incompatibilities. This is a continuation of course 150, the chief subject being that of incompatibilities. Several hundred different prescriptions are studied from the point of view of compounding the various ingredients of remedies in the best sequence. The literature is carefully abstracted in order that students may become familiar with the manner of compounding the newer remedies that are not found in Pharmacopoeias. The aim of the work of this course is to teach students to detect dangerous prescriptions and to overcome incompatibilities.

Senior year; second semester; 3 credits; 3 recitations.

152. Prescription Compounding. In this course students are expected to apply the principles of Prescription Lectures to the actual compounding of prescriptions. Many difficult and obscure prescriptions are submitted to students, who are called upon to deal with them as they deem best. In this way their ability as well as their knowledge is tested and if not accurate is corrected at once. The work of this course also deals with all the details of managing the prescription counter. The latter part of the course deals with perfecting of formulas for toilet preparations. Instruction is also given in the repair and making of mirrors, repair of apparatus, and other necessary operations common to a pharmacy.

Senior year; second semester; 2 credits; 2 3-hour laboratory periods.

160. Commercial Pharmacy. The aim of this course is to give students an idea of the requirements of an efficient manager of a pharmacy. Regular topics relating to the commercial phase of pharmacy are discussed, such as planning and arrangement of a pharmacy, keeping up stock, salesmanship, window trimming, etc. A special feature of the course is the work in sign-card painting including extensive work with the air brush. For students not registered in the department the work is exclusively sign-card painting.

Elective; first semester; 3 credits; 1 recitation and two laboratory periods.

161. Commercial Pharmacy. A continuation of course 160 with the added feature of taking of inventory, price lists, study of druggists sundries, side lines and air brush work. At definite times during the course successful business men will deliver lectures on the commercial side of pharmacy.

Elective; second semester; 3 credits; 1 recitation; 2 laboratory periods.

170. Manufacturing Pharmacy. This course is a continuation of the course on Pharmaceutical Preparations and deals with the manufacture of the more difficult pharmaceuticals that involve chemical reactions. The work is most exacting and requires a thorough knowledge of chemistry. As examples of the kind of preparations made, the following are mentioned; viz., spirits of nitrous ether, iodoform, ferrous iodide preparations, etc.

Senior year; first semester; 2 credits; 2 three-hour laboratory periods.

TEXT BOOKS.

Caspari, Treatise on Pharmacy.

Stevens, Pharmaceutical Arithmetic.

Scoville, Art of Compounding.

Ruddiman, Incompatibilities of Prescriptions.

United States Pharmacopoeia.

Ruddiman, Why's in Pharmacy.

Lilly, Organic Drugs.

Schlotterbeck, Pharmacognosy Notes.

Kraemer, Botany and Pharmacognosy.

Dorland, Medical Dictionary.

Era Dose Book.

Sturmer, Pharmaceutical Latin.

Tyrode, Pharmacology.

Mimeographed Notes for all laboratory courses.

INDUSTRIAL EDUCATION.

PROFESSOR RESSLER
PROFESSOR BROOKS
PROFESSOR GRIFFIN
PROFESSOR MILAM
ASSOCIATE PROFESSOR BLANCHARD
ASSISTANT PROFESSOR SHEPHERD

The department of Industrial Education offers courses for the preparation of teachers in the subjects of Agriculture, Home Economics, Commerce, and Manual Training. The importance of providing special instruction in the industries for the pupils of the public schools is fully recognized in this country. The material equipment in the way of laboratories, workshops, experimental fields, etc., is easily secured. Specially trained teachers cannot be prepared overnight. There is a real danger that the public will underestimate the scientific and educational significance of the new education. The industrial branches cannot be taught from textbooks nor by teachers without technical training.

There must also be special supervisors in each of the industrial branches for the larger schools, where instruction is given to a large number of pupils under both trained and untrained teachers. Supervisors who will do some regular teaching, are also required where a number of small town and country districts are grouped for industrial instruction. In time, we may expect the grade teachers to have secured through the high and normal schools the technical training that will enable them to teach the industrial branches under direction. Until that time, most of the teaching must be done by the special instructor.

The department of Industrial Education gives the professional training and advises with the students and deans of the various schools in the selection of the technical courses. In conjunction with the other departments concerned, tentative courses of study are prepared in each of the industrial branches, adapted to the age of the pupils and the social demands on the school. This department undertakes to assist teachers in the work of instruction, by general and special suggestions through college and other publications, and by correspondence and visitation. Detailed lists of equipment and apparatus, with cost, suitable for small and large schools, will be furnished on request.

Students electing this course will be registered in the school in which their distinctive subject is given. Thus those who desire to prepare to teach and supervise Agriculture in the high school and grammar grades will be registered in the School of Agriculture and will receive their degrees in Agriculture on completion of the requirements.

In the same way students desiring to prepare to teach Home Economics and Commerce will be registered in the schools of Home Economics and Commerce. A special degree course in Industrial Arts, described under that heading, has been organized for the preparation of teachers of Manual Training.

The following courses will be offered during 1915-16:

101. General Psychology. A study of general psychology by lectures, recitations, and reports; a description of the facts and laws of mental activities with applications to the ordinary affairs of life; demonstrations and experiments showing the relation of mental life to the nervous system; the significance of habit in conduct and character.

Junior or senior year; first or second semester; 3 credits; 2 recitations; 1 laboratory period.

102. Educational Psychology. The application of the facts and principles of psychology to teaching; a study of the growth of the child mind and the relations of the various periods to educational organization; adaptation of courses of instruction, methods of teaching, discipline, and general school activities to the stages of the pupil's development; lectures, recitations, reports, and simple investigations.

Junior or senior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

120. History of Education. A general review of the growth and development of education and its relation to the civilization of the times; particular attention given to the rise of industrial education in Europe and America, and its place in the social and political life of the country.

Sophomore or junior year; first or second semester; 3 credits; 3 recitations.

130. School Management. A study of the organization of the school, including the relations and duties of pupils, teachers, supervisors, and school board. The place of the special teacher in the system; questions of discipline; practical exercises in making pro-

grams, keeping records, filling out reports, and performing other duties required by the Oregon School Law.

Sophomore or junior year; first or second semester; 3 credits; 3 recitations.

140. General Method. The principles of teaching, including method of the recitation, preparation of lesson plans, and observations of model teaching; library references to periodicals and current literature relating to public school agriculture, domestic science and art, commerce, and manual training.

Junior or senior year; first or second semester; 3 credits; 3 recitations; 1 laboratory period (2 in H. E. section).

150. Special Method in Agriculture. A careful, detailed study of the public school course in Agriculture, in its various relations, including the other subjects in the curriculum, preparation for college, farming, community life, etc. Model courses for both elementary and secondary grades are constructed with plans for all desired equipment for laboratory, library, field work, including cost. Lesson plans on typical subjects, observation and model lessons, practice teaching, and extension work with school children and adults, provide additional opportunities to enable the students to reduce theory to practice.

Required of Agricultural seniors majoring in Industrial Education; elective for all other seniors in Agriculture; senior year; first or second semester; 3 credits; 2 recitations; 1 library period.

151. Extension Methods in Agriculture. This is a special course designed to prepare the graduate for such duties as are incumbent upon County Agricultural Agents, members of the College Extension Staffs, and high school agriculturists. The work, which consists largely of lectures and reports upon assigned reading, deals with the social, economic, and educational phases of agriculture. Practical experience in extension work will be given members of the class so far as possible.

Required of Agricultural seniors majoring in Industrial Education; elective for all other seniors in Agriculture; senior year; second semester; 1 credit; 1 recitation.

160. Special Method in Home Economics. Same as course 150 applied to the public school course in Domestic Science.

Senior year; first or second semester; 3 credits; 2 recitations; 1 laboratory period.

161. Special Method in Home Economics. Same as course 150, applied to the public school course in Domestic Art.

Senior year; second semester; 3 credits; 3 recitations; 1 laboratory period.

170. Special Method in Manual Training. Same as course 150, applied to the public school course in Manual Training.

Senior year; first or second semester; 3 credits; 2 recitations; 1 laboratory period.

180. Special Method in Commerce. Same as course 150, applied to the public school course in Commerce

Prerequisites: Commerce 102, 402, 412.

Senior year; first semester; 2 credits; 1 recitation; 2 laboratory periods.

181. Special Method in Commerce. Continuation of course 180.

Senior year; second semester; 2 credits; 1 recitation; 2 laboratory periods.

190. School Administration. A discussion and analysis of the American system of education, with an interpretation of the purpose and spirit of each division; problems of administration and teaching in the public schools; the correlation of the industrial branches with the other subjects in the curriculum. Lectures, reading, reports, and studies on the Oregon schools.

Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

191. School Hygiene. A course in the health provisions requisite for the hygienic conduct of education. This includes a discussion of ventilation, heating, light, seating, physical exercise in the school room and on the playground, games, medical inspection, tests for physical defects, disinfection, quarantine, and other similar topics. Oregon laws relating to these matters will be studied, and the regulations of the State Board of Health and other State and local health authorities will be explained in detail. Advanced investigations in other states will also be presented and comparative studies made. Lectures, reports, and first-hand investigations on town and country school conditions, so far as practicable.

Elective for advanced or graduate students; first semester; 2 credits; 2 recitations.

192. Child Study. This includes the physical and mental characteristics of children and youth as contrasted with those of

mature men and women. The relation of physical growth and development to the unfolding of mental powers; the instincts and their relation to the development of individuality, sense of responsibility to others, moral development, etc.; abnormalities; study and treatment of children as individuals and in class groups; and discussion of the social and economic implications as well as the psychological. Lectures, reports, and simple tests and records made by visitation of schools.

Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

200. Research. Advanced or graduate students who are qualified by previous training or experience, may register for extended investigation of some specific problem in industrial education. The studies may be historical, either European or American; administrative; or in the field of method. General government and state reports; publications by special commissions; reports of committees of educational organizations; contributions by departments of colleges and universities; educational and other periodicals; and original investigations into Oregon conditions, compose the material to be used. These studies will be assigned and outlined by the instructor and stated reports made from time to time by the student. Regular hours will be assigned the individual students and credit given according to the amount of work done.

Elective for advanced or graduate students; first semester; 2 credits.

201. Research. Continuation of course 200.

Elective for advanced or graduate students; second semester; 2 credits.

202. Research. As outlined in course 200.

Elective for advanced or graduate students; first semester; 4 credits.

203. Research. Continuation of course 202.

Elective for advanced or graduate students; second semester; 4 credits.

ART AND ARCHITECTURE

PROFESSOR McLOUTH
MR. ROBINSON
MISS FLARIDA

ART

The department of art offers no regular courses in art with the idea of instruction in the fine arts in view, but only as art education relates to highest ideals in everyday life, and to meet the requirements of art in the industries. Courses in drawing, composition, light and shade and color are planned and given for the purpose of facilitating instruction in the applied arts courses—design, metal work, clay modeling, and the ceramic art; and in the work of such other departments as Domestic Art, and Industrial Arts.

The following art courses not only develop utilitarian ideas, but they also cultivate an appreciation and love of the beautiful in nature and art.

102. Free-Hand Drawing. This course covers work in representation; still life in line and dark and light; free-hand perspective of circles and linear perspective; some of the principles of composition and design; historic ornament; the handling of pencil and charcoal, or brush and ink.

The degree course in Home Economics; freshman year; first semester; 2 credits; 2 studio periods of two hours each, and one recitation.

103. Beginning Composition. The study of design principles applied to concrete problems of dress or home decoration; crayon, charcoal, and pencil are used as media. Some historic design is studied.

Prerequisite: Drawing 102.

The degree course in Home Economics; freshman year; second semester; 2 credits; 2 studio periods of two hours each and one recitation.

204. The Theory and Harmony of Color. This course covers the study of the so-called primary colors, the development of the prismatic colors with their complements, color quality, color values and the various harmonies. Problems in monochromatic, complementary, analogous and dominant harmonies are to be rendered. These problems will be an application of harmonious color schemes

as applied to articles of household use, dress, and home interiors. Three 2-hour periods; one credit.

Prerequisites: Courses 102, 103.

Degree course in Home Economics; sophomore year; first semester; 2 credits; 3 studio periods of two hours each.

205. Water Color. The courses in water color are offered as elective cultural subjects and are open to any student who has completed course 102, 103, and 204 or their equivalent. The work of the first semester will include simple flat washes of geometric casts, and flat color washes of still life subjects of broad area.

First semester; 2 credits; 3 studio periods of two hours each.

206. Water Color. A continuation of course 205, leaving flat washes and taking up more complex still life studies, posters, and landscapes. These courses are open to all students after the required prerequisites in drawing and course 205.

Second semester; 2 credits; 3 studio periods of two hours each.

305. Advanced Design. An elective offered to give a broader working knowledge of design principles which shall serve as a guide to selection, adaptation, and composition, both structural and decorative, for practical application in interior decoration, costume design, and for articles of personal and household use.

Prerequisites: Courses 102, 103, and 104.

First semester; 2 credits; 3 studio periods of two hours each.

306. Advanced Design. A continuation of course 305.

Prerequisites: Courses 102, 103, 204, and 305.

Second semester; 2 credits; 3 studio periods of two hours each.

M. E. Vocational course; first year; second semester; 1 credit; 3 studio periods of one hour each.

411. Industrial Arts Design. A course in the principles of design suited to the Industrial Arts course. Original design plates of door and cabinet paneling, metal parts—hinges, escutcheons, draw pulls, etc.—and furniture will be required.

The degree course in Industrial Arts; second semester; 2 credits; 3 studio periods of two hours each.

412. Industrial Arts Design. A continuation of course 411.

Prerequisite: Course 411.

The degree course in Industrial Arts; second year; first semester; 1 credit; 1 studio period of three hours.

413. Clay Modeling. The study of good pottery forms, and the making and decoration of pottery, occupies most of the time of

this course. Some work in plaster casting, also the building of tiles and modeling of low relief.

Prerequisites: Courses 102 and 103.

Elective; the degree course in Home Economics; senior year; first semester; 2 credits; 3 studio periods of two hours each.

414. Clay Modeling. A continuation of course 413, with a study of glazes and firing of pottery.

Prerequisites: Courses 102, 103, or their equivalents, and 413.

Elective; the degree course in Home Economics; senior year; second semester; 2 credits; 3 studio periods of two hours each.

505. Water Color Rendering. The purpose of this course in water color rendering is to give a knowledge of the handling and use of the brush and color in the expression of architectural subjects, detail, and decoration.

506. Water Color Rendering. A continuation of course 505, followed by full color drawings of buildings and their surroundings. Later in the semester opportunity is given for out-of-door sketching in color. During the summer which follows, students are encouraged to make sketches for criticism.

Landscape Gardening; elective; sophomore year; second semester; 2 credits; 2 studio periods of three hours each.

The following courses are open to students who have had courses 102 and 103 or their equivalents and to Industrial students having courses 411 and 412 or their equivalents.

600. Art Metal Work. The first semester will be given to work in jewelry-making, using copper and silver, and covering the processes of sawing, hard and soft soldering, stone setting, etching, repousse, and cuttle bone casting.

Prerequisites: Courses 102, 103, or their equivalent.

Elective; the degree course in Home Economics; or any student having the desired prerequisites; 2 credits; 3 studio periods of two hours each.

Deposit for tools, \$2.00. Studio fee, \$1.00.

601. Art Metal Work. A continuation of course 600, with the addition of some work in hammered metal.

Prerequisites: Courses 102, 103.

Elective; the degree course in Home Economics; or any student having the desired prerequisites; senior year; second semester; 2 credits; 3 studio periods of two hours each.

Deposit for tools, \$2.00. Studio fee, \$1.00.

602. Art Metal Work. The work of the first semester will cover the processes of piercing, etching, sinking, sawing, riveting, straight bending and repousse, in the making of such articles as desk sets, book ends, trays, ladles, bag tops, plates, hinges, corners, etc.

Studio fee, \$1.00. Deposit for tools, \$2.00.

Three 2-hour periods; 2 credits.

603. Art Metal Work. The second semester work will be largely the problems of raising, hard and soft soldering, and soft enameling, in the making of tools, pitchers, vases, etc.

Studio fee, \$1.00. Deposit, \$2.00.

Three 2-hour periods; 2 credits.

ARCHITECTURE.

The courses in Architecture, for the most part, are given with the idea of serving the other departments throughout the College. Students interested in rural or domestic architecture, however, may elect such subjects as they may be prepared to take.

501. Architectural Drawing. In this course the student is taught the use of the drawing board, T-square, triangle, and instruments. One plate each week will be prepared for the purpose of practice in lettering, line drawing, and scale. Much attention will be given to neatness and to correct presentation. The textbook will be *Architectural Drawing and Lettering* by Bournan Holst-Brown.

Freshman year; first semester; 3 credits; 3 draughting room periods of three hours each.

502. Orders of Architecture. This is a continuation of course 501, in which the proportions of the Classic orders or architecture are studied. Diluted ink drawings rendered in water color on Whatman hot pressed paper will be presented. The textbook will be the *American Vignola*, Part I.

Freshman year; second semester; 3 credits; 3 draughting room periods of three hours each.

507. Wood Construction. This course is carried on in conjunction with course 510 and has one recitation each week, using *Kidders Building Construction*, Part II, *Carpentry*, as a textbook. Scale drawings, showing the construction of wooden buildings, designed by the student will be presented periodically. The proper-

ties of wood, methods of construction, and use of building materials will be carefully studied.

Sophomore year; first semester; 2 credits; 1 recitation; 1 draughting room period.

508. Masonry Construction. This course will be studied similarly to course 507 and in conjunction with course 511, using Kidder's Building Construction, Part I, Masonry, as a textbook.

509. Shades and Shadows. Although shades and shadows are studied in connection with the Orders, advanced work is given using as a textbook McGoodwin's Shades and Shadows.

Sophomore year; first semester; 1 credit; 1 draughting room period.

510. Rural Architecture. In this course original work in design is first offered. Problems such as bungalows, houses, and schools will be given the student for solution. Only frame buildings will be studied, and the drawings will be presented as sketches, except the structural drawings for course 507, which will be practical working drawings.

Sophomore year; first semester; 3 credits; 3 draughting room periods.

511. Rural Architecture. A continuation of course 510 in which buildings of masonry are studied. Drawings will be presented formally, the design and construction being original.

Sophomore year; second semester; 3 credits; 3 draughting room periods.

512. Eight Hour Problems. On one Saturday in each month, a problem in design will be assigned to the student to be worked out "en loge."

Junior year; first semester; 1 credit.

513. Eight Hour Problems. A continuation of course 512.

Junior year; second semester; 1 credit.

514. History of Architecture. Hamlin's History of Architecture will be thoroughly studied in this course, presenting the development of styles since prehistoric times.

Junior year; first semester; 1 credit; 1 recitation period.

515. History of Architecture. A continuation of course 514.

Junior year; second semester; 1 credit; 1 recitation period.

516. Domestic Planning. This course takes up house planning from the practical standpoint. The drawings will be literal and

comprehensive. The site, cost, use, and everything that goes into such a building will receive due consideration.

Elective; first semester; 2 credits; 2 draughting room periods.

517. Domestic Planning. A continuation of course 516.

Elective; second semester; 2 credits; 2 draughting room periods.

518. Perspective Drawing. A study of mechanical perspective.

Sophomore year; second semester; 1 credit; 1 draughting room period.

533. Agricultural Building Design. This course is for students of agriculture. Design and construction of buildings for the farm are studied. The work is individual; thus each student may elect the particular kind of buildings in which he is especially interested.

Elective; first semester; 2 credits; 2 draughting-room periods of three hours each.

535. Advanced Agricultural Building Design. A continuation of course 533.

Elective; second semester; 2 credits; 2 draughting-room periods.

536. Farm Plan Drawing. The work of this course is prescribed for students studying farm management. The conventional methods of indicating lines, roads, fields, etc., will be carefully presented.

Elective; first semester; 1 credit; 1 draughting-room period.

601. Elementary Landscape Architectural Drawing. This course takes up lettering and line drawing at the beginning and develops into the study of the presentation of garden plans. The relation of architecture to the garden will be observed in all drawings and various architectural styles will be noted. Only pen and ink drawings will be presented.

Freshman year; first semester; 3 credits; 3 draughting-room periods.

602. Advanced Landscape Architectural Drawing. A continuation of course 601, in which drawings will be made using water colors.

Freshman year; second semester; 3 credits; 3 draughting-room periods.

701. Elementary House Planning. This course consists of practical problems in planning and construction. All drawings will be working-drawings presented on detail paper. The work is prescribed for Industrial Arts students.

Junior year; first semester; 3 credits; 3 draughting-room periods.

702. Advanced House Planning. A continuation of course 701. Junior year; second semester; 3 credits; 3 draughting-room periods.

D. A. 501. House Construction and Decoration. (See School of Home Economics.)

D. A. 502. Advanced House Construction. A continuation of D. A. 501.

Elective; second semester; 2 credits; 2 draughting-room periods of two hours each.

CHEMISTRY.

PROFESSOR FULTON
ASSOCIATE PROFESSOR TARTAR
ASSOCIATE PROFESSOR BRODIE
ASSISTANT PROFESSOR DAUGHTERS
MR. DUTCHER
MR. SEELEY
MR. DUNCAN
MR. BEARD

The beginner's courses, Chemistry 100, 101, and 102, consist essentially of the proof of some of the well-known chemical laws, such as the law of conservation of matter, the law of definite proportions and of multiple proportions, the Law of Boyle, and the Law of Charles. The student attains skill in the manipulation of apparatus, and in the management of equipment in general. From this elementary work he proceeds to qualitative analysis, in the study of which he is taught to separate and identify the different elements composing the mass, and, in the case of metals, to learn of their properties, their use, the different methods of obtaining them from their ores, and the combinations in which they occur in nature.

If he has shown suitable proficiency, he advances to quantitative analysis, which is the determination of the amounts of the ingredients. He is taught both methods of analysis, volumetric, or the method by solution, and the gravimetric, or the method by precipitation and weighing. On completing these courses, the student is fairly well prepared to take up advanced chemistry, which treats of the analysis of soils, manures, cattle foods, dairy products, etc., or he can take up the subject from the inorganic side in the analysis of minerals, fuels, oils, gas, etc., or he can view it from the pharmacist's standpoint, in analyzing drugs.

The following courses are offered:

A. Chemistry. This course is designed primarily for students taking the course in Mechanic Arts. It does not pretend to be a complete course in theoretical chemistry; it is to assist in familiarizing the student with the changes that take place when metals come in contact with such materials as sulphur, oxygen, acids, water, etc. A certain amount of instruction is given in the non-metals, such as stated, in the properties of matter, common elements, and compounds; chemical equivalents and atomic weights; ionization; solution; electrolysis; carbon and its com-

pounds; reduction; combustion; etc.; but all instruction will be mainly practical in character. No previous knowledge of chemistry is required for this course. A good high school course in physics, however, would be of great assistance in this course, and a thorough understanding of ratio and proportion is essential. Text, Stansbie's Introduction to Chemistry for Technical Students, Wade's Foundations of Chemistry.

Second year; 3 credits; 3 recitations; 2 laboratory periods of two hours each.

B. Chemistry. A continuation of course A.

Second semester; 3 credits; 3 recitations; 2 laboratory periods.

10. General Chemistry. This course deals with the general principles of the science, and extends through the divisions known as the non-metals. It is offered to students who have had no previous training in chemistry. It consists of lectures, recitations, and laboratory work.

Three credits.

11. General Chemistry. A continuation of course 10.

Three credits.

It is found advisable to divide the time into one lecture, two recitations, and two laboratory periods of two hours each, so far as courses 10 and 11 are concerned, and all students registered for them will be required to arrange their schedules accordingly.

100. General Chemistry. This course is arranged for students who have completed high school chemistry.

Freshman year; first semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

101. General Chemistry. A continuation of course 100.

Freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

General chemistry is required for all degree courses except Commerce.

102. General Chemistry. This course is arranged especially for the students of the School of Home Economics.

103. General Chemistry. A continuation of 102.

Freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

104. Chemical Calculations. A course in the mathematics of chemistry; offered to those who intend teaching the subject, and required of all laboratory assistants.

Elective; first or second semester; 2 credits; 2 recitations.

105. A course in general chemistry designed for pharmacy students, and intended to include the greater part of what is known as the "non-metals."

Freshman year; first semester; 5 credits; 3 recitations and 2 laboratory periods of three hours each.

106. A continuation of 105, consisting of the chemistry of the metals. It is intended to accompany course 300.

Second semester; 2 credits; 2 recitations.

Freshman year; first semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

107. Synthetic Inorganic Chemistry. A laboratory course in inorganic chemistry, designed to illustrate the principles and methods involved in the preparation of a large number of the most important substances used in chemical preparations.

Elective; first or second semester; 2 credits; 2 laboratory periods.

200. Elementary Organic Chemistry. A brief course in Organic Chemistry, which is provided for the students of Home Economics.

Sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

201. Organic Chemistry. This course consists of the study of the more typical and simple organic compounds and is designed for Pharmacy, and such students of Agriculture as desire to take up Physiological Chemistry and Veterinary Medicine.

Sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

202. Organic Chemistry.

Second semester; 3 credits; 2 recitations; 2 laboratory periods.

Required for the degree course in Pharmacy.

300. Qualitative Analysis. This course consists largely of laboratory practice in the ordinary processes of separating and identifying ions.

The course in Pharmacy; freshman year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

301. Qualitative Analysis. A course provided for Mining students.

Mining students; sophomore year; first semester; 5 credits; 5 laboratory periods of three hours each.

302. Qualitative Analysis. Students in Highway Engineering. Three credits; 1 recitation; 3 laboratory periods of two hours each.

303. Organic Qualitative Analysis. A course for Pharmacy students.

Elective; second semester; 3 credits; 3 recitations; 2 laboratory periods.

304. Food and Drug Analysis. Pharmacy students.

Prerequisites: Organic Chemistry and Botany.

Senior year; 3 credits.

400. Quantitative Analysis. A course designed for students in Pharmacy, and consists of instruction in both gravimetric and volumetric analysis of pharmaceutical products.

Sophomore year; first semester; 4 credits.

401. Quantitative Analysis. This is a course in analysis for Mining students, and consists of gravimetric analysis of limestones, iron, lead, zinc, arsenic, and antimony ores, coal, and as much other work as time will permit.

The course in Mining Engineering; sophomore year; second semester; 5 credits; 5 laboratory periods.

402. Chemistry of Foods. An advanced course for the students of Home Economics, consisting of practice in the best methods as applied in food analysis, and in detection of common adulterants. Opportunities for research work will be given if desired.

Four credits.

403. Chemistry of Water. This course is designed especially for the students in Highway Engineering, and consists of the examination, both physically and chemically, of waters for domestic purposes, such as well waters, but more particularly that supplied to cities, whether under municipal control or that of private corporations. At the close of the chemical examinations, bacteriological tests will be made under the auspices of the department of Bacteriology.

Prerequisites: Chemistry 100, 101, and 300.

The course in Highway Engineering; junior year; second semester; 2 credits; 2 laboratory periods.

404. Alkaloidal Testing. A study of the alkaloids of the drug plants as regards their structure and synthesis. The means of their identification by the various alkaloidal tests will be studied in the laboratory as well as the means of identifying those organic

compounds that enter pharmaceutical preparations. This course will also include the means of detection of the common poisons in the animal body.

First semester; 2 credits; 2 laboratory periods.

Prerequisites: Chemistry 100, 101, 300, and 201.

405. Drug Assaying. The quantitative estimation of the active principles of crude drugs and their preparations, such as solid and fluid extracts, tinctures, pills, etc. The assay of a number of inorganic pharmaceutical preparations will be included in this course.

Methods for the physiological standardization of drugs and drug preparations will be discussed by the instructor.

Second semester; 2 credits; 2 laboratory periods.

Prerequisites: Chemistry 100, 101, 300, 201, and 404.

304. Food and Drug Analysis. This course affords suitable preparation for the students to hold positions in the Federal Food and Drug Laboratories.

The food and drug products on the market that are subject to the greatest adulteration will be analyzed for preservatives and other added materials.

The course will include work in the library, as well as in the laboratory.

Senior year; first semester; 3 credits; 3 laboratory periods.

Prerequisites: Chemistry 100, 101, 300, 400, and 201.

406. Chemistry of Highway Materials. The course is designed for students in Highway Engineering, and consists of the study of such materials as cement, asphalt, bitumen, mineral oils, tar, and tar products.

The course in Highway Engineering; junior year; second semester; 2 credits; 2 laboratory periods.

407. Electro-Chemistry. This is a course for advanced Mining students, and consists of the application of the electric current to solutions of the different metals in metallurgical analysis.

Senior year; first semester; 3 credits; 1 lecture; 2 laboratory periods.

408. Chemistry for Engineers. This course is particularly for students in Mechanical and Electrical Engineering. It consists of the analysis of coal, oil, gas, and of their calorific powers; also the technical analysis of flue gases.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods.

409. Physiological Chemistry. This course will include the discussion of the chemical composition of the tissues and the chemistry of physiological processes that take place in the body coupled with such demonstrations as will add to the value and interest of the course. Special emphasis will be given the analysis of both normal and pathological urine.

Senior year; second semester; 3 credits; 3 lectures and demonstrations.

Prerequisite: Chemistry 100, 101, and 200.

410. Elementary Physical Chemistry. This course is particularly for students in Chemical Engineering, and consists of the study of the molecular weight of gases; chemical equilibrium; electro-chemistry.

Junior year; first semester; 3 credits; 2 recitations; 1 laboratory period of three hours.

411. Thermochemistry. A course for the students in Chemical Engineering; consists of thermochemical measurements; heat of formation; heat of combustion; relation of chemical affinity to heat of reaction, etc. A continuation of 410.

Junior year; 3 credits; 1 lecture; 2 laboratory periods.

412. Metallurgical Analysis. This consists of the analysis of Metallurgical and Engineering materials, such as limestone, cement, coal, iron ore, copper matte, brass, bronze, steel, babbitt metal, water, oil, etc.

The course in Chemical and Mining Engineering; junior year; first semester; 3 credits; 3 laboratory periods.

413. Chemical Technology. A course of lectures in the principles of Organic, Analytical, and Technical Chemistry as applied to those industries depending upon chemistry as a basis for their processes.

The course in Chemical Engineering; senior year; first semester; 2 credits. A continuous course: credit will not be awarded until the second semester's work has been completed.

414. Chemical Technology. A continuation of course 413.

The course in Chemical Engineering; senior year; second semester; 2 credits.

500. Agricultural Chemistry. A course consisting of lectures, recitations, and laboratory work, dealing with the more important phases of Chemistry as related to Agriculture.

The course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

501. Agricultural Chemistry. A continuation of course 500.

The course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each.

502. Dairy Chemistry. The study of the chemistry of milk and its products, including both qualitative and quantitative determination of adulterants and preservatives.

Prerequisites: Chemistry 201 and 500.

The course in Dairy Husbandry; junior year; second semester; 3 credits; 3 laboratory periods of three hours each.

503. Soil Chemistry. This is a lecture and laboratory course on the methods of soil analysis, as used by the different experiment stations.

Prerequisites: Chemistry 201 and 500.

Junior year; first semester; 2 or 4 credits; 2 or 4 laboratory periods of three hours each.

504. Soil Chemistry. A continuation of course 503.

Junior year; second semester; 2 or 4 credits; 2 or 4 laboratory periods of three hours each.

505. Agricultural Analysis. A course in analytical methods applied to agricultural materials, including cereals, fertilizers, soil, water, etc.

Prerequisites: Chemistry 201 and 500.

Junior year; first semester; 2 or 4 credits; 4 laboratory periods.

506. Agricultural Analysis. A continuation of course 505.

Junior year; second semester; 2 or 4 credits; 4 laboratory periods.

507. Advanced Agricultural Analysis. This course is especially thesis work in the Experiment Station laboratory, or work of the same general description.

Senior year; first semester; 4 credits; 4 laboratory periods.

508. Advanced Agricultural Analysis. A continuation of course 507.

Senior year; second semester; 4 credits; 4 laboratory periods.

509. Animal Chemistry. A study of the composition of the animal body and products of the animal body, such as milk, wool, etc. Special emphasis is placed on the chemistry of the fats, proteins, and carbohydrates. Enzyme action, digestion of foodstuffs, their absorption and distribution, fate of the foodstuffs in metabolism, metabolic products and their excretion, will be considered.

Recent publications bearing on animal nutrition will be read and discussed.

Junior year; first semester; 2 credits; 2 lectures.

510. Plant Chemistry. Designed for students desiring a fuller consideration of the growth and composition of plants; properties, nature, and classification of plant constituents; chemical analysis; chemical synthesis; enzymes; chemistry of the manufacture of plant products, etc.

Second semester; 2 credits; 2 lectures.

Three actual 60-minute hours constitute one laboratory period, for which one credit is allowed.

511. Seminar. The work will consist of reports on advanced studies, and reviews of articles appearing in scientific journals, and experiment station literature. These papers will be prepared under the supervision of the department, although considerable latitude will be allowed in the selection of subjects and manner of presentation. Required of all senior students majoring in Agricultural Chemistry.

Junior or senior year; first semester; 1 credit.

512. Seminar. A continuation of course 511.

Second semester; 1 credit.

ENGLISH LANGUAGE AND LITERATURE

PROFESSOR BERCHTOLD
ASSISTANT PROFESSOR CALLAHAN
ASSISTANT PROFESSOR PETERSON
MR. BALDWIN
MRS. McELFRESH
MISS ROSAEN

It is the aim of this department to teach the student to express with clearness what he thinks with vigor. He is taught that the essential part of any composition, whether oral or written, is thought, well organized and well expressed; that to comprehend clearly and to feel strongly what he has to say are the indispensable conditions of making others comprehend and feel it.

What his textbook helps him to do consciously, familiarity with superior writers should help him to do unconsciously; for we may get good from a master of English by unconscious absorption, just as we acquire good manners by associating with gentlemen and ladies. No mind can fail to be stimulated by contact with greater minds, whether living or dead. Their pages feed the powers of thought and strengthen the power of expression, thus enabling the student to think, talk, and write to more purpose.

In all the collegiate courses in English the work is correlated with that offered in the other departments, to bring it into harmony with the trend or spirit of the institution, which is distinctly technical and industrial in character. Subjects are assigned for presentation and discussion which bear close relation to the work pursued by the students in the different schools, in anticipation of their probable needs and activities in later life. What is sought and insisted on is, earnest, logical, forceful presentation of facts that will compel attention and carry conviction.

The Oregon Agricultural College participates in a number of intercollegiate oratorical contests and debates; and the department offers elective courses in public speaking, designed to give preparation for these contests.

A. Elementary Constructive English and Literature. This course is designed first, to make expression of ideas a pleasure to the student. It is not confined to the mere memorizing of inflections and the formulation of rules. The course consists of both oral and written work. Written exercises prepared under rules of form are required constantly to obtain flexibility and confidence

in expression. There is daily drill in punctuation and capitalization, in analysis and synthesis of sentences. Special emphasis is laid upon spelling. Practice in the correction of written work is given to enable the student to detect his own mistakes readily. Elementary themes, one, two, and three paragraphs in length, are required, the subjects being chosen from the student's experience, and from classic readings. Ten short themes, with conferences for criticism, will be required.

The course is designed, second, to cultivate in the student a taste for reading; to assist him in the interpretation of the simpler classics of our literature; and to encourage him to express his own thoughts clearly and without embarrassment. Masterpieces of prose and poetry are studied, and some collateral reading is required. Oral and written reports on current events as outlined in the Literary Digest, the Atlantic Monthly, the Independent, and other standard magazines. Special attention is given to—

"The Odyssey," Lang's translation.

"Snowbound," Whittier.

The Vocational courses; first year; second semester; 3 credits; 3 recitations.

B. Composition and Literature. The aim of this course is to ground students thoroughly in the elements and fundamentals of composition, and to continue the work in elements of literature. Capitalization and punctuation reviewed; the importance of letter writing emphasized; principles governing sentence structure, paragraph structure, and theme structure, studied, with certain classic models always in the foreground; the aim is, in short, to develop power of expression and individuality as spontaneously and naturally as possible. Further, the logical arrangement of thoughts as represented by the outline, receives special emphasis. At least eight short themes, six long themes, synopses, and one resume, with conferences for criticism to illustrate the forms of composition.

The following classics will be studied:

"The Iliad," Lang's translation.

"The Pilgrim's Progress," Part I, Bunyan.

"The Merchant of Venice," Shakespeare.

"The Vision of Sir Launfal," Lowell, or "The Ancient Mariner," Coleridge.

The Vocational courses; first year; second semester; 3 credits; 3 recitations.

C. Advanced Composition and Literature. Open to students who have had courses A, B, or their equivalent.

A review of the principles of grammar; exercises in syntactical construction; principles governing the structure of the whole composition; analysis and outline of specimens of easy classic prose and poetry, with a view to illustrating theme structure; writing of short compositions in class on "read up" matter; and the preparation of twelve short themes and two long themes, in the narrative and descriptive forms, with attention to sentence structure, spelling, punctuation, and paragraph arrangement.

Principles of literary criticism; interpretative study of classics; analysis and rendering. George Eliot's "Silas Marner," Irving's "Tales of a Traveler," Parkman's "Montcalm and Wolfe," or Dickens' "Tale of Two Cities," constitute the list of classics from which selections for study will be made.

The Vocational courses; second year; first semester; 3 credits; 3 recitations.

D. Advanced Composition and Literature. A continuation of course C. Intensive study of the Paragraph, the Sentence, and the Word; study of synonyms; paragraph writing, with a view to applying the principles governing the development of the topic statement; at least ten short themes, occurring weekly, and three long themes, in the expository and argumentative forms.

Continuation of the methods of work employed in the first semester. A selection of two classics will be made for study from a list consisting of Shakespeare's "As You Like It," Lockwood's "The Freshman and His College," Hawthorne's "The House of Seven Gables."

The Vocational courses; second year; second semester; 3 credits; 3 recitations.

E. Junior-Senior Secondary English. The object of offering these courses is to afford students not having completed the English work of the third and fourth years of the secondary school an opportunity to take that work.

The courses contemplate in part preliminary surveys of English and American literature, the latter being given during the first semester and the former during the second. A study is made of the characteristics of literary epochs, with attention directed to the shaping influence of contemporary civil events. Study of a typical

masterpiece belonging to each epoch. Special assigned readings, followed by oral and written reports.

The work in Rhetoric and Composition involves an intensive study of and practice in the four forms of discourse outlined in the first two years of the secondary school. The aim is to establish good usage. Considerable written work, including in its scope resumes, synopses, expository outlines, argumentative briefs, and themes in the four forms of discourse, is required throughout the year.

Textbooks: Abernethy's "American Literature," and Long's "English Literature."

No textbook is required in Rhetoric and Composition; the principles of rhetoric will be evolved from the discussion of the written work prepared by members of the class. Those planning to pursue the course are, however, requested to bring with them, in order to have at hand as convenient reference, Brooks' two-book course in English Composition, used in the high schools of Oregon.

The Vocational course; first semester; 3 credits; 3 recitations.

F. Continuation of E.

The Vocational course; second semester; 3 credits; 3 recitations.

M. Business English. Besides giving a thorough training in the various forms of commercial correspondence, the course aims to ground the student in the vocabulary, forms, and usages peculiar to business and administrative pursuits. There is constant and persistent practice in spelling and punctuation, in composition and letter writing, with a view to imparting to the student's English strength and virility, and to enable him to achieve results.

Two-year Business course; second year; first semester; 3 credits; 3 recitations.

N. Advanced Business English. A continuation of course M. Advanced composition and letter writing; business forms, incidental writing; summaries; advertising; preparation of copy and proof-reading. Good, clear, effective English is at all times insisted upon.

Two-year Business course; second year; second semester; 3 credits; 3 recitations.

31. College Rhetoric. A rapid survey comprehending the work done by the high school in literature, rhetoric, and composition, and involving the preparation of several short essays, with a

view to ascertaining the extent of the student's literary appreciation and command of rhetorical principles. Lectures, assignments, and recitations upon the methods of effective discourse. Studies in the expository and argumentative methods of writing, with analysis of specimens. The paragraph considered as a distinct stage in expository composition; practice writing to exemplify the various methods of developing the topic statement. Plotting of simple briefs, and writing of easy forensics. At every stage of study selections from standard and contemporary authors will be read and discussed, in order that the student may acquire ability to master content, differentiate literary types, and appreciate standards of excellence. Subjects of composition will be those suggested by the student's personal, school, literary, community, and vocational interests, oral composition supplementing written.

Compositions required: five expository and three argumentative short themes; one expository long theme requiring research and accompanied by outline and bibliography; one resume and one criticism; one argumentative long theme, accompanied by brief. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that he writes in other departments.

Courses in Home Economics and Industrial Arts; freshman year; first semester; 3 credits; 3 recitations.

32. Advanced College Rhetoric. Study of the elements and principles involved in effective discourse, continued. Lectures on the characteristics of the literature of feeling, with a rendering of selections for illustration. Discussion of the narrative and descriptive methods of writing. Expository and emotional description differentiated. Examination of the narrative principle in epic forms, in ballad literature, in the incidents occurring in the drama, in the news letter, and in anecdote. Studies and practice writing in the narrative paragraph and in dialogue. Analysis of two or three of the briefer and less complex short stories of standard authors, for the purpose of gaining an appreciation of the form and function of the short story type.

Compositions required: five short descriptive themes; four short narrative themes; one long narrative; one long theme retelling in abstract the story of a book of fiction; one criticism of a short story. Frequent oral delivery.

Courses in Home Economics and Industrial Arts; freshman year; second semester; 3 credits; 3 recitations.

51. The English Essay and Novel. Study of structure of novel and essay. Study of essay and novel as expressions of national life and thought. Emphasizing the growth of the economic, critical, historical, and personal essay, and the larger categories of fiction; the novel of manners, of character; the problem novel and the romantic novel. Class and individual assignments, lectures, and reports.

Course in Home Economics; sophomore year; first semester; 3 credits; 3 recitations.

52. The English Drama. Study of the Elizabethan and the Stuart drama; the modern drama. A survey of the rise and development of the tragedy, comedy, and historical play. Study of setting, plot, structure, and characters. Reading of plays in class; reports on assigned readings.

Courses in Home Economics; sophomore year; second semester; 3 credits; 3 recitations.

61. The History of English Literature. A general outline course of the history of English literature. This includes a survey of the principal forms of literature as exemplified by the masters in each field. The aim is to cultivate an appreciation of what is excellent in quality and form. Masterpieces representing the best thought and form are studied in class or assigned to students for careful reading and reports. Chief attention given to Chaucer, Spenser, Shakespeare, Milton, Swift, Poe, Johnson, Burke, Goldsmith, and Burns.

Elective in all courses; first semester; 3 credits; 3 recitations.

62. The History of English Literature. A continuation of course 61. A study of the master minds of the nineteenth century. Wordsworth, Scott, Shelley, Keats, Macaulay, Dickens, Thackeray, George Eliot, Matthew Arnold, Carlyle, Ruskin, Stevenson, and others. Lectures, readings, and discussions; critical reports on assigned topics required from all the students.

Elective in all courses; second semester; 3 credits; 3 recitations.

71. American Literature. A study of the growth and development of literature in our country. Particular emphasis is placed on the study of writers of the nineteenth century, including such authors as Irving, Cooper, Bryant, Poe, Hawthorne, Longfellow, Holmes, and Lowell, as well as to prominent writers of the present

day. Lectures; class study; class reading; reports on assigned topics; essays.

Elective in all courses; senior year; first semester; 3 credits; 3 recitations.

72. American Literature. A continuation of course 71. The metropolitan writers; literature in the South; literature in the West; present schools and tendencies; periodical literature. Lectures; class room work; reports; essays.

Elective in all courses; senior year; second semester; 3 credits; 3 recitations.

81. Modern English Prose. A study of representative modern prose writers, with special reference to prose as found in present day standard periodicals. Study of the newspaper paragraph. Practice in reporting lectures. Exercises in the elaboration of field notes. Drills looking to the popularization of technical matters and the results of experiments. Writing of papers and reports. Theme writing. Oral composition.

The courses in Agriculture, Forestry, Logging Engineering, Mechanical Engineering, Highway and Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy.

Freshman year; first semester; 3 credits; 3 recitations.

82. Modern English Prose. A continuation of course 81.

The courses in Agriculture, Forestry, Logging Engineering, Mechanical Engineering, Highway and Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy.

Freshman year; second semester; 3 credits; 3 recitations.

101. Special Composition. If a student, in his work in any department, submits papers notably deficient in English, he may be required, at any time, to take course 107. It consists wholly of theme work and consultations, and is continued in each case as long as the needs of the student require.

All courses; first and second semesters; 2 recitations.

103. Composition of Addresses. This course deals with the composition of the most important kinds of addresses, including the argument, the eulogy, the commemorative address, and various forms of non-forensics. The work consists of lectures, a study of textbooks, analysis of masterpieces, practice in the composition of the various forms, and frequent class room exercises.

Elective in all courses; junior year; first semester; 2 credits; 2 recitations.

104. Extempore Speaking. Practice in the presentation of the various forms of addresses. Speeches are prepared on topics of special interest to the students and delivered with the view to making them most effective as means in the advancement of a particular cause. Extensive criticism is offered as to methods of selection, organization and presentation.

Elective in all the courses; junior year; second semester; 2 credits; 2 recitations.

105. Practical Public Speaking. Practice in the presentation of the various forms of public addresses, voice training, study of gesture, bearing, and the elements of ease, grace, and force in presentation. Practice in the rapid preparation and in the impromptu delivery of speeches on topics of current interest. Designed for those who wish some general training in public speaking. Drill in parliamentary procedure.

Elective; first semester; 3 credits; 3 recitations.

106. Practical Public Speaking. Continuation of course 105.

Elective; second semester; 3 credits; 3 recitations.

107. Argumentation. Practical work in brief-drawing, the collection and handling of evidence, and debating. Each student will prepare several debates under the direction of the instructor; construct briefs and participate in class room debates. Personal consultation with the instructor on thought, composition, and delivery. This course is a critical and practical study of argumentation. The class is limited in number, and the course can be taken only with the consent of the instructor.

Elective; second semester; 2 credits; 2 recitations.

108. Oratory. This course is intended as special preparation for those who wish to enter oratorical work. The work consists of lectures on the theory of oratory, the preparation of original orations, class room exercises, and personal conferences and criticism. The course can be taken only with the consent of the instructor.

Elective; first semester; 1 credit; 1 recitation.

141. Technical English. The writing which the engineer has to do is almost wholly of the nature of exposition. Indeed, it is only in so far as it is expository that it offers any problems different from those which arise in general composition. In technical English, then, in the engineering courses, attention is centered on exposition of the various types which the engineer has to use, in

description, in narration, in directions, in criticism, and in argumentation.

Textbook: Earle's Theory and Practice of Technical English for Engineers.

At all times it will be insisted on that whatever facts the student expresses, shall be expressed accurately; that the treatment of the subject shall be complete for the purpose in hand; that the form of presentation shall be logical; and that the expression shall be economical for the reader.

Required in the course in Mining; elective in all other engineering courses; senior year; first semester; 3 credits; 3 recitations.

142. Technical Business English. Study of advanced technical composition. Special attention is given to letters of application, letters of inquiry and information, circular letters, letters of complaint, sales letters, follow-up letters, and collection letters. The ability to write a clear, forceful, effective letter has become a first requisite, not only for business success, but for intellectual and social recognition.

The course in Commerce; freshman year; second semester; 3 credits; 3 recitations.

191. Story-Telling. The study of children's literature, and the analysis and reproduction of short stories suitable for the primary grades, the kindergarten, and the nursery.

Elective in the course in Home Economics; senior year; first semester; 1 credit; 1 recitation.

192. Story-Telling. A continuation of course 191.

Elective in the course in Home Economics; senior year; second semester; 1 credit; 1 recitation.

206. Expression. Literary interpretation, including analysis, memorizing, and rendering of selected masterpieces of prose and poetry. The aim of this course is to enable the student not only to understand and appreciate the thought and spirit of literature, but to render it naturally and effectively; to correct erroneous habits of speech, and to give freedom, purity, and strength of tone; to cultivate the power of expression through imagination; to eliminate artificiality, affectation, and self-consciousness.

Elective; first semester; 2 credits; 2 recitations.

207. Expression. Continuation of course 206.

Elective; second semester; 2 credits; 2 recitations.

208. Dramatic Interpretation. Advanced literary interpretation. Training in delivery of masterpieces of prose and poetry. Interpretative study of Shakespeare and the modern drama; presentation of scenes from plays; bodily expression; impersonation.

Prerequisites: Courses 206 and 207.

Elective; first semester; 2 credits; 2 recitations.

209. Dramatic Interpretation. Continuation of course 208.

Elective; second semester; 2 credits; 2 recitations.

301. Journalism. Opportunity for valuable practice in writing for publication is afforded by the existence at the Oregon Agricultural College of a number of technical and scientific publications, besides those of general interest. The list of publications includes: the Barometer, general student paper, published twice a week; the Oregon Countryman, monthly agricultural-domestic science publication; the Student Engineer, published by the students of the Engineering and Forestry courses; the Commerce-Pharmacy Journal, published by the students of Commerce and Pharmacy; and the Orange, the junior annual.

Elective; first semester; 1 credit; 1 recitation.

302. Journalism. A continuation of course 301.

Elective; second semester; 1 credit; 1 recitation.

315. Seminar. Study and review of the recognized masterpieces of Continental literature in approved translations. Written reviews. Reports on assigned readings. Lectures.

Elective in all courses; first semester; 2 credits; 2 recitations.

316. Seminar. A continuation of course 315.

Elective in all courses; second semester; 2 credits; 2 recitations.

HISTORY

PROFESSOR HORNER

D. United States History. With special attention to the colonial, political, and industrial aspects. A brief course that covers the leading events of our history. Particularly important in Oregon since the introduction of direct legislation and equal suffrage.

Two-years Business course; first year; second semester; 3 credits; 3 recitations.

30. European History. Course 30 includes the study of Europe at the time of Louis XIV; reconstruction of Europe at Utrecht; Russia and Prussia become European powers; Wars of Frederick the Great; Struggle between France and England for India; Rivalry of France and England in North America; The Old Regime in Europe; The Spirit of Reform; Enlightened Despots of the Eighteenth Century; The French Revolution; The First French Republic; Europe and Napoleon; The Reconstruction of Europe at the Congress of Vienna.

Elective; first semester; 3 credits; 3 recitations.

40. Modern Europe. This course comprises a study of the following subjects: Europe after the Congress of Vienna; The Industrial Revolution; Revolution of 1848; Unification of Italy; Formation of the German Empire and the Austro-Hungarian Union; The German Empire; France under the Third Republic; Social and Political Reforms in England; British Empire in the Nineteenth Century; Russian Empire in the Nineteenth Century; Turkey and the Eastern Question; The Expansion of Europe in the Nineteenth Century; Some of the great problems of today.

The course in Commerce; sophomore year; second semester; 3 credits; 3 recitations.

52. History of the British Empire. A coherent view of the larger factors influencing national development from the earliest times to the British Empire of today. Social, economic, artistic, and intellectual growth is broadly surveyed, and is made to reveal a picture of the changing conditions of the people rather than that of the king and nobility. Legal and constitutional development is also emphasized by tracing the origin and development of English common law and by discussing the nature and importance of the great statutes. Particular attention is given to such subjects as

the Industrial Revolution, Growth of the Power of the House of Commons, the Extension of the Franchise, Remedial Legislation, and Colonial and Imperial Development.

Elective; senior year; first semester; 3 credits; 3 recitations.

62. Contemporary American History (1877-1914). The history of the United States from the Reconstruction Period to the inauguration of President Wilson. Such matters as the negro question, the industrial revolution, capitalism and socialism, free silver, direct government, woman suffrage, the growth of judicial review, the new nationalism, imperialism, the labor movement, the progressive movement, the Panama-Colombia question, present status of the Monroe Doctrine, and our relation with the Latin-American republics, are discussed from the standpoint of history.

The course in Commerce; freshman year; second semester; 3 credits; 3 recitations.

70. History of Oregon. Early explorations. Lewis and Clark expedition. Minor expeditions. Fur trade. Rivalry between companies. Era of immigration. Oregon organized under Hudson Bay Company. Agitation in Congress for military occupation of the Columbia. The Nez Perce Indians ask for the Bible. Response by Methodists and Congregationalists. Doctor Whitman and the Oregon movement. Struggle for the Willamette. Struggle for the Columbia. First transcontinental wagon road. Provisional government. Progress of immigration and missions. Gold excitement. Subdivision of Oregon into territories. Indian wars. Home building. Disposition made of the Indians. Oregon becomes a state. Introduction of improved fruit, grains, and stock. Ships and railways. Select schools, public schools, and higher education. Oregon literature. Industrial training, and introduction of scientific methods. Irrigation; conservation of forests. "The Oregon System" of direct legislation.

The course in Commerce; sophomore year; first semester; elective second semester; 3 credits; 3 recitations.

80. American Diplomatic History. This course deals with the history of the chief events in American foreign affairs from the beginning of the government to the present time. Its purpose is to show the policies of our government on the same subject at different times, the causes for the changed policies, and the methods employed to work out the policies. An attempt is made to show the changed attitude of governments in their dealings with

each other in the course of our national history. Throughout the course considerable attention will be given to character studies of the men leading in our diplomatic work. The ultimate aim is the application of our experience to present problems.

Elective; senior year; second semester; 3 credits; 3 recitations.

100. American Biography. A study in the public careers of typical American statesmen and other men of affairs. It is intended to cover the entire field of American history. The object is to emphasize the personal element in our national development and to become more familiar with the leaders of our economic progress. Students desiring to place especial stress upon any feature of the study may elect not to exceed 20 per cent of their allotment of biographical research. Lectures, assigned reading, and discussion.

Elective; junior or senior year; first semester; 3 credits; 3 recitations.

LIBRARY.

MRS. KIDDER
MISS LEWIS
MISS GEORGE
MISS DOBELL
MISS HAIGHT
MISS CLAUSMEYER

Equipment. The Library occupies the second floor of the Administration building and one room on the first floor. The reading and general reference room is large, well lighted, and extends entirely across the building. It is supplied with about five hundred leading magazines and newspapers. Through the courtesy of the editors, a large number of farm, orchard, stock, and home journals, and country newspapers of Oregon are received regularly at the reading room. The book stacks, occupying adjacent rooms, contain 25,000 volumes of standard works of history, biography, engineering, agriculture, natural science, general literature and reference, and about 3000 reports and other publications from the Agricultural Colleges and Experiment Stations of all the states, with 30,000 bulletins and pamphlets. The library is a designated depository of United States Government publications, of which it has about 7,000 volumes. Over 2,000 of these were received as a gift from the library of the late United States Senator Dolph.

Practical use of the books has led to the establishment of small laboratory collections kept in the rooms of the following departments: General Chemistry, Agricultural Chemistry, Animal Husbandry, Agronomy, Horticulture, Botany, Forestry, Bacteriology, Zoology, Pharmacy, Commerce, and Civil, Mechanical, Electrical, and Mining Engineering. Each department library is in charge of the head of that department, to whom application must be made for the use of the books.

All books are classified and catalogued according to the Dewey decimal system. Books may be drawn for home use by all officers and students of the College. Books may be kept by the students for two weeks with the privilege of a renewal, and by officers for any reasonable time. All students have free access to the shelves of the library.

The reference library in the reading room consists of encyclopedias, dictionaries, standard reference books in the different departments of study, together with books designated by professors

for collateral reading in the various courses of instruction. A small collection of books for cultural reading is also kept in the reading room. In the same room, and accessible to all readers, is the card catalogue of the general library, including the books of the department libraries. The catalogue includes both authors and subjects under one alphabet on the dictionary plan; there is also a card catalogue of the publications of the U. S. Department of Agriculture, and a card index to the publications of the State Experiment Stations.

1. **Library Practice.** This course teaches, by means of lectures and practical problems, the use of catalogues, indexes, and reference books, such as dictionaries, encyclopedias, atlases, handbooks of general information, handbooks of history, statistics, quotations, etc.

All degree courses; freshman year; one semester; $\frac{1}{2}$ credit; 1 recitation.

MATHEMATICS.

PROFESSOR JOHNSON
ASSOCIATE PROFESSOR BEATY
ASSISTANT PROFESSOR TARTAR
MR. BEARD

A. Algebra. The work of the course includes a drill in the fundamental operations, use of parentheses, special rules of multiplication and division, factoring, highest common factor, lowest common multiple, and fractions.

The Mechanics Arts course; first year; first semester; 5 credits; 5 recitations.

B. Algebra. The topics studied are solution of fractional and literal equations, problems involving linear equations, simultaneous linear equations, involving two or more unknown numbers, problems involving simultaneous linear equations, graphical representation, inequalities, involution, evolution, theory of exponents, radical expression, and imaginary numbers.

The Mechanic Arts course; first year; second semester; 5 credits; 5 recitations.

C. Algebra. Required of freshmen who enter with but one year of Algebra.

Either semester; 3 credits; 3 recitations.

D. Plane Geometry. Course D includes the first two books of Plane Geometry. The constant aim is to develop in the student the power of logical reasoning, and of clearness and accuracy of expression. To this end, many original exercises are studied, and at all times demonstrations and proofs are freely discussed in the class room. Required of freshmen entering deficient in first semester of Plane Geometry.

First semester; 3 credits; 4 recitations.

E. Plane and Solid Geometry. A continuation of Course D, arranged for freshmen in Engineering who enter deficient in the second semester of Plane Geometry.

Second semester; 5 credits; 5 recitations.

F. Solid Geometry. Required of all Engineering freshmen who are deficient in Solid Geometry.

Freshman year; first semester; 2 credits; 3 recitations.

G. Plane Geometry. Courses G and H are arranged for freshmen who enter deficient in the second semester of Plane Geom-

etry, and who desire to use both semesters to make up the condition. The two courses are equivalent to course K.

Freshman year; first semester; $1\frac{1}{2}$ credits; 2 recitations.

H. Plane Geometry. A continuation of course G.

Freshman year; second semester; $1\frac{1}{2}$ credits; 2 recitations.

K. Plane Geometry. A continuation of course D, covering the last three books of Plane Geometry. Many original exercises are studied. Required of freshmen, except those in Engineering, who enter deficient in second semester of Plane Geometry.

Second semester; 3 credits; 4 recitations.

L. Plane Geometry. A course arranged to meet the needs of students in Mechanic Arts.

The course in Mechanic Arts; second year; second semester; 4 credits; 5 recitations.

M. Commercial Arithmetic. A review of all the essential operations. Special stress is laid on short methods; daily drills in rapid calculation; computation of estimates; partnership settlements, etc.

The two-years Business course; first year; first semester; 3 credits; 5 recitations.

N. Commercial Arithmetic. A continuation of course M.

The two-years Business course; first year; second semester; 3 credits; 5 recitations.

O. Shop Arithmetic. A thorough drill in the principles of arithmetic, with special application to shop problems of all sorts.

The course in Mechanic Arts; second year; first semester; 4 credits; 5 recitations.

R. Farm Arithmetic. An elective course for students in the one-year course in Agriculture who feel the need of a review of arithmetic. A practical text dealing with problems of the farm will be used.

The vocational course in Agriculture; second semester; 3 credits; 3 recitations.

T. Geometry and Trigonometry.

The course in Mechanic Arts; third year; first semester; 4 credits; 5 recitations.

10. Advanced Arithmetic. An advanced course in commercial arithmetic, especially for students in the School of Commerce. To do successful work in this course, the student should have a thorough knowledge of all the fundamental operations of arith-

metic, including the various phases of percentage and interest. Emphasis is laid on computations of the more difficult problems connected with partnership and corporation settlements, balance sheets and statements, equation of accounts, partial payments, savings bank accounts, compound interest, stocks and bonds, life insurance, and annuities, partly for the information obtained in the various subjects and partly for the drill afforded in the use of figures. Daily drills are given in short methods and rapid calculation.

The course in Commerce; freshman year; first semester; 3 credits; 3 recitations.

11. Plane Trigonometry. This course includes functions of acute angles, right angles, functions of any angle, relations between functions, inverse functions, trigonometric equations, and oblique triangles. Considerable time is devoted to the deduction of trigonometric formulae, study of trigonometric identities, and the solution of practical problems.

All Engineering courses; freshman year; first three-fifths first semester; 3 credits; 5 recitations.

12. Plane Trigonometry. The course in Industrial Arts; second semester; 3 credits; 3 recitations.

14. Trigonometry. A review of algebra, including logarithms, is followed by a course similar in character to 11, except that more time is given to the solution of partial problems.

The course in Forestry; freshman year; first semester; 3 credits; 4 recitations.

15. Spherical Trigonometry. The courses in Highway and Irrigation Engineering; freshman year; first semester; one credit; one recitation.

21. College Algebra. After a brief review of radical expressions, theory of indices, and quadratic equations, graphical representation and mathematical induction are studied.

All Engineering courses; freshman year; last two-fifths of first semester; 2 credits; 5 recitations.

31. Elementary Analysis. Under College Algebra are treated the binominal theorem, progressions, complex numbers, and the theory of equations. In analytical geometry the point, straight line, circle, conic sections, and some of the higher plane curves are studied. Considerable time is given to the plotting of curves in both rectangular and polar coordinates.

All Engineering courses; freshman year; second semester; 5 credits; 5 recitations.

34. Elementary Analysis. This course is similar to 31, but shorter. Particular emphasis is given to curve plotting in both rectangular and polar coordinates.

The course in Forestry; freshman year; second semester; 3 credits; 4 recitations.

41. Plane Analytic Geometry. Course 41 is offered to students who enter the sophomore year deficient in Analytic Geometry. The topics studied are the point, the straight line, polar coordinates, transformation of coordinates, the circle, conic sections, tangents, diameter, poles and polars, discussions of general equations of the second degree, problems in loci, and higher plane curves.

All Engineering courses; sophomore year; first semester; 3 credits; 3 recitations.

51. Differential Calculus. Among the subjects presented are: differentiation and applications, evaluation of indeterminate forms, expansion of functions, Taylor's and Maclaurin's theorems, maxima and minima, points of inflection, curvature, change of independent variable, functions of two or more variables, asymptotes, curve tracing, etc.

All Engineering courses; sophomore year; first semester; 4 credits; 5 recitations.

52. Integral Calculus. Among the topics considered are: direct integration, definite integrals and applications; integration by parts, integration of trigonometric forms, etc.; applications to finding of lengths and areas of curves, surfaces, and volumes of solids of revolution, etc.; double and triple integration and applications. In this course, as in Course 51, great stress is laid upon practical applications, and a large number of practical problems are solved.

All Engineering courses; sophomore year; second semester; 4 credits; 5 recitations.

61. Differential Equations. A study of the solution of ordinary and partial differential equations which the Engineering student is likely to encounter.

Prerequisites: Courses 51, 52.

Elective; junior year; first semester; 3 credits; 3 recitations.

71. Method of Least Squares. Prerequisites: Courses 51, 52.

Elective; junior year; second semester; 2 credits; 2 recitations.

MODERN LANGUAGES

PROFESSOR BACH
MISS MARTIN

Courses of three years are offered in French, German, and Spanish, respectively. In some courses, a certain amount of work in a language is required. In other courses, German, French, or Spanish may be taken as electives. Any student who takes a language as an elective will be given full credit for one year's work.

The end in view is practical use for the various pursuits of life. Consequently the method of teaching is thoroughly practical, combining all the theory necessary with all the practice possible.

Students desiring to elect one year of work in Modern Language may do so and receive full credit for the course.

FRENCH

101. French. Grammar; oral and written exercises; some of the irregular verbs in general use; reading of 100 to 150 pages of easy prose.

First semester; 3 credits; 3 recitations.

102. French. A continuation of course 101.

Prerequisite: Course 101.

Second semester; 3 credits; 3 recitations.

103. French. Grammar continued; irregular verbs; reading of intermediate texts; oral and written exercises.

Prerequisites: Courses 101, 102.

First semester; 3 credits; 3 recitations.

104. French. A continuation of course 103.

Prerequisites: Courses 101, 102, 103.

Second semester; 3 credits; 3 recitations.

In addition to the regular second year's work, a special elective conversational course is offered for all students who have completed the first year's work. (See course 109.)

105. French. Science course. Reading of selections from French scientific literature.

Prerequisites: Courses 101, 102, 103, 104.

First semester; 2 credits; 2 recitations.

106. French. A continuation of course 105.

Prerequisites: Courses 101, 102, 103, 104, 105.

Second semester; 2 credits; 2 recitations.

107. French. General third year course comprising selections from the various classes of literature, together with composition and conversational exercises.

Prerequisites: Courses 101, 102, 103, 104.

108. French. A continuation of course 107.

Prerequisites: Courses 101, 102, 103, 104, 107.

Second semester; 3 credits; 3 recitations.

109. French. A conversational course. Provides interesting and profitable conversational drill on practical every-day topics and includes, in a new form, a helpful review of the elements of the language.

Prerequisites: Courses 101, 102.

110. French. A continuation of course 109.

Second semester; 1 credit; 1 recitation.

111. French. Conversational course. Provides well-graded and systematically planned talks on all sorts of topics.

Prerequisites: Courses 101, 102, 103, 104.

First semester; 1 credit; 1 recitation.

112. French. A continuation of course 111.

Prerequisites: Courses 101, 102, 103, 104, 111.

Second semester; 1 credit; 1 recitation.

Courses 105, 106, 107, 108, 111, 112 will not be given in 1915-16.

GERMAN

201. German. Grammar; elementary forms with oral and written exercises; reading of 100-150 pages of easy prose.

First semester; 3 credits; 3 recitations.

202. German. A continuation of course 201.

Prerequisite: Course 201.

Second semester; 3 credits; 3 recitations.

203. German. Grammar continued; reading of intermediate texts; oral and written exercises.

Prerequisites: Courses 201, 202.

First semester; 3 credits; 3 recitations.

204. German. A continuation of course 203.

Prerequisites: Courses 201, 202, 203.

Second semester; 3 credits; 3 recitations.

In addition to the regular second year's work, a special elective conversational course is offered for all students who have completed the first year's work. (See course 211.)

205. German. Science course. Reading of selections from German scientific texts.

Prerequisites: Courses 201, 202, 203, 204, 207, 208.

Elective; first semester; 2 credits; 2 recitations.

206. German. A continuation of course 205.

Prerequisites: Courses 201, 202, 203, 204, 205.

Second semester; 2 credits; 2 recitations.

207. German. A general three-years course comprising selections from the various classes of literature, together with composition and conversational exercises.

Prerequisites: Courses 201, 202, 203, 204.

First semester; 3 credits; 3 recitations.

208. German. A continuation of course 207.

Prerequisites: Courses 201, 202, 203, 204, 207.

Second semester; 3 credits; 3 recitations.

209. German. Conversational course. Provides interesting and profitable conversational drill on practical everyday topics and includes, in a new form, a helpful review of the elements of the language.

Prerequisites: Courses 201, 202.

First semester; 1 credit; 1 recitation.

210. German. A continuation of course 209.

Prerequisites: Courses 201, 202, 203, 204, 209.

Second semester; 1 credit; 1 recitation.

211. German. Conversational course. Provides well-graded and systematically planned talks on all sorts of topics.

Prerequisites: Courses 201, 202, 203, 204.

First semester; 1 credit; 1 recitation.

212. German. A continuation of course 211.

Prerequisites: Courses 201, 202, 211.

Second semester; 1 credit; 1 recitation.

SPANISH.

301. Spanish. Grammar; elementary forms; oral and written exercises; reading of easy text, 100-150 pages.

Sophomore year; first semester; 3 credits; 3 recitations.

302. Spanish. A continuation of course 301.

Second semester; 3 credits; 3 recitations.

303. Spanish. Grammar continued; reading of intermediate texts; oral and written exercises.

Prerequisites: Courses 301, 302.

First semester; 3 credits; 3 recitations.

304. Spanish. A continuation of course 303.

Prerequisites: Courses 301, 302, 303.

Second semester; 3 credits; 3 recitations.

In addition to the regular second year's work, a special elective conversational course is offered for all students who have completed the first year's work.

305. Spanish. Conversational course. Provides interesting and profitable conversational drill on practical everyday topics and includes, in a new form, a helpful review of the elements of the language.

Prerequisites: Courses 301, 302.

First semester; 1 credit; 1 recitation.

306. Spanish. A continuation of course 305.

Prerequisites: Courses 301, 302, 305.

Second semester; 1 credit; 1 recitation.

307. Spanish. General third year course. Reading of standard selections from Spanish general literature with composition and conversation.

Prerequisites: Courses 301, 302, 303, 304.

First semester; 3 credits; 3 recitations.

308. Spanish. A continuation of course 307.

Prerequisites: Courses 301, 302, 303, 304, 307.

Second semester; 2 credits; 2 recitations.

309. Spanish. Conversational course. Provides well-graded and systematically planned talks on all sorts of topics.

Prerequisites: Courses 301, 302, 303, 304.

First semester; 1 credit; 1 recitation.

310. Spanish. A continuation of course 309.

Prerequisites: Courses 301, 302, 303, 304, 309.

Second semester; 1 credit; 1 recitation.

Courses 307, 308, 309, 310, will not be given in 1915-16.

PHYSICS

PROFESSOR ANDERSON
ASSISTANT PROFESSOR BEVAN
ASSISTANT PROFESSOR WOOSTER
MR. BLAIR
MR. BELKNAP

The following courses are offered:

A. Elementary Physics. An elementary or high school course in physics.

The vocational course in Mechanic Arts; third year; first semester; 3 credits; 3 recitations; 1 laboratory period.

B. Elementary Physics. A continuation of course A.

Second semester; 3 credits; 3 recitations; 1 laboratory period.

1. General Physics. A course in general physics, descriptive rather than mathematical in character, covering the subjects of mechanics and heat.

Prerequisites: Elementary physics; geometry.

The courses in Agriculture and Electrical Engineering; freshman year; the courses in Forestry and in Industrial Arts, sophomore year; elective in the course in Commerce, freshman year; first semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period.

2. General Physics. A continuation of course 1 covering the subjects of sound, light, electricity, and magnetism.

Required as listed under course 1; second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period.

101. Engineering Physics. A course in mechanics and heat.

Prerequisites: Elementary physics; trigonometry.

The course in Electrical Engineering, Highway Engineering, Irrigation Engineering, Logging Engineering, Mechanical Engineering, and Mining Engineering; sophomore year; first semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period.

102. Engineering Physics. A continuation of course 101, covering the subjects of electricity and magnetism, sound and radiation.

Sophomore year; second semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period.

105. Electrical Physics. An advanced course in general physics.

The course in Electrical Engineering; sophomore year; first semester; 3 credits; 1 lecture; 2 recitations; 1 laboratory period.

Prerequisites: Physics 1 and 2; trigonometry.

106. Electrical Measurements. A continuation of course 105, in which the study and use of electrical measurements is emphasized.

The course in Electrical Engineering; sophomore year; second semester; 3 credits; 1 lecture; 2 recitations; 1 laboratory period.

Prerequisite: Physics 105.

131. Household Physics. A brief descriptive course with such applications as are of greatest interest to students in Home Economics.

The course in Home Economics; sophomore year; first semester; 4 credits; 3 lectures; 2 recitations; 1 laboratory period.

201. Electrical and Magnetic Measurements. A laboratory course in the exact determination of electrical and magnetic quantities, calibration of instruments, etc.

The course in Electrical Engineering; junior year; first semester; 2 credits; 1 three-hour laboratory period.

The course will be repeated during the second semester, as an elective, should a sufficient number of students apply.

202. Electricity and Magnetism. An advanced course, taking up the theory of electrical measuring instruments, etc., with suitable practice in the laboratory.

Elective; credit to depend on work done.

211. Heat and Light. An advanced course, taking up the phenomena of heat and light in detail, including recent discoveries.

Elective; credit to depend on work done.

222. Wireless Telegraphy. A study of electric waves, their measurement, and their application to practical wireless telegraphy.

Prerequisites: Math. 51, 52; E. E. 101.

The course in Electrical Engineering; junior or senior year; elective; second semester; 3 credits.

PHYSICAL EDUCATION.

PROFESSOR STEWART
PROFESSOR THAYER
MR. ARBUTHNOT
MRS. STOCKWELL
MISS LEWIS
MISS CLEAVES
MR. PAVEY

PHYSICAL EDUCATION FOR MEN.

Athletics. All College athletic contests are under the jurisdiction of the athletic board, composed of two members of the faculty, two members of the student body, and one alumnus.

Direct and active supervision comes from the athletic board, which supports representative teams in football, basketball, wrestling, track and baseball, and awards monogram "O's" to members of these teams. The most efficient coaches are furnished to all of these teams, while assistants teach the theory and practice of the various sports to freshmen and other teams.

The new gymnasium will furnish to the students at the Oregon Agricultural College the most modern and complete equipment for specializing in indoor sports, while the new athletic field includes a new quarter-mile track, football field, and baseball diamond.

The armory, one of the largest of its kind in the United States, provides fine facilities for winter training in football, track, baseball, and the various other outdoor sports. An indoor track, banked at the turns, which is but eight laps to the mile, furnishes facilities which are proving a great aid in shaping all of the teams into condition.

Gymnasium Work. Because physical health determines capacity for efficiently carrying out work which a student prepares for in college, the importance of Physical Education in the modern educational institution is being emphasized more and more every year. The functions of this department are: (1) to develop organic power, the basis of vitality, necessary to physical and mental efficiency; and (2) to secure and maintain a good posture, harmonious muscular control, and a reasonable degree of scientific training for expert gymnasium and field athletic work.

The new gymnasium for men, two units of which have been completed, is equipped with all of the modern gymnastic apparatus

and facilities for properly carrying on the work in physical education and recreation. The floor, 90x150 feet in dimensions, furnishes ample space for the most efficient type of gymnasium work.

Features of the new gymnasium which will add to its attractiveness will be two regulation-sized handball courts; two squash courts; three basketball courts; regulation-sized, padded rooms for boxing and wrestling; bowling alleys; steel lockers to accommodate all the men students; modern hygienic showers, steaming rooms, hot rooms, etc., for scientific care of the body.

The treasurer's receipt for the \$1.50 gymnasium fee entitles the holder to registration at the gymnasium office for full privileges of the gymnasium, including physical examination, chart of measurements, strength test, locker, free towels, etc.

On the basis of the physical examination, special work of such a nature as the student's physique demands will be assigned, and a careful plan outlined for the symmetrical development of the body.

Membership and regular practice on any of the varsity squads is accepted as an equivalent for gymnasium work during the active practice season, the attendance being reported weekly.

Fall Work. Instruction is given in both theory and practice of Physical Education. During the warm weather of the first semester the department emphasizes the desirability of outdoor work, furnishing a large and efficient corps of instructors in football, basketball, tennis, volley ball, soccer, field hockey, swimming, cross country, track athletics, etc.

Winter Work. The active gymnasium work starts with the beginning of the fall rains, about October 15, when outdoor work is no longer convenient. The work prescribed is intended to correct cases of scoliosis, flat-foot, flat chest, round shoulders, or any other deformity which is susceptible of improvement through corrective medical gymnastics.

Recreative games, such as basket ball, hand ball, indoor baseball, wrestling, boxing, indoor tennis, volley ball, etc., are also conducted during the winter period.

Spring Work. In the spring, full advantage will be taken by the gymnasium instructors of the opportunity for cross-country runs, track and field work, and out-door games with the classes, during which occasions correct methods of breathing, form in running, and proper carriage of the body will be emphasized.

Normal Course. Many students expect to take up the profession of teaching after graduation from college. A general knowledge of the theories of physical education and methods of gymnastics and athletic instruction is often of material assistance in securing important teaching positions.

Students showing an especial aptitude and interest in physical education will be admitted to this course. The work will include lectures on the history and development of physical training, the general physiological principles of exercises, methods of teaching, and first aid to the injured. Calisthenics, gymnastic drills, apparatus work, games, and athletics will comprise the practical work of the course.

Elective; hours and credits subject to arrangement.

All sophomores, freshmen, and students of the Vocational courses, unless physically unable, are required to take physical training. The classes meet twice a week for sixty-minute periods.

One-half credit per semester is allowed for this work, and is a requirement toward graduation.

COURSES IN PHYSICAL EDUCATION FOR MEN.

11. First year Vocational; first semester; 2 periods; $\frac{1}{2}$ credit.
12. First year Vocational; second semester; 2 periods; $\frac{1}{2}$ credit.
13. Second year Vocational; first semester; 2 periods; $\frac{1}{2}$ credit.
14. Second year Vocational; second semester; 2 periods; $\frac{1}{2}$ credit.
15. Freshman year; first semester; 2 periods; $\frac{1}{2}$ credit.
16. Freshman year; second semester; 2 periods; $\frac{1}{2}$ credit.
17. Sophomore year; first semester; 2 periods; $\frac{1}{2}$ credit.
18. Sophomore year; second semester; 2 periods; $\frac{1}{2}$ credit.
19. **Hygiene.** This course consists of a series of lectures on general hygienic subjects, covering such points as sleep, light for study, cold and catarrh, with a general consideration of social and personal hygienic topics.

Freshman year; first or second semester; $\frac{1}{2}$ credit.

PHYSICAL EDUCATION FOR WOMEN.

Purpose. The aim of this department is to bring each student to her best possible physical condition, and by a careful system of gymnastic training to correct faulty posture and carriage, to aid in the formation of habits of hygienic living, to establish a normal condition in the circulatory and respiratory systems, to secure bodily vigor, and to attain a healthy and symmetrical development, rather than the greatest increase in mere muscular power. Students are under the care of teachers who have had thorough medical training, and will be given special medical and corrective gymnastics, prescribed according to individual needs as indicated by their physical examinations.

Requirements. Work in physical education is required of all women four periods a week in all full-year, special, optional, and vocational courses, regardless of the student's course or classification. One credit a semester is granted for this work. After the satisfactory completion of two years' regular work, the courses will be made elective or optional for women who pass a satisfactory physical examination and have a correct posture and carriage. Corrective gymnastics will be prescribed for all others, credit being allowed on the basis indicated above. At least four credits are required in Physical Education toward graduation.

Persons presenting credentials of work in physical education taken elsewhere may be given credit for such work in so far as it is equivalent to the requirements of this institution.

Women students are required to be able to swim a distance of 35 yards by the end of their sophomore year. (This requirement will go into effect after the completion of the swimming pool in the new gymnasium.)

Special Corrective and Medical Gymnastics. Students who are shown by their physical examinations to be unfit for the work of the regular classes in gymnastics and sports, or to have physical defects, will be assigned to corrective classes where the work is light and the emphasis is laid on correct breathing and posture, relaxation and rest; or, whenever necessary, students will be given private work in medical or corrective gymnastics according to their individual needs. Thus the physical condition of each student is carefully diagnosed and supervised. The instructors encourage

conferences concerning matters of health, personal and sex hygiene, and as far as possible advise proper treatment for the student's temporary ailments. They also take care of the emergency and first aid work for the women of the College.

Costumes. In order that the gymnasium costumes be hygienic and uniform, a regulation suit and shoes are required of all students. The shoes are sold by the local dealers, subject to the approval of the director. The suits should be ordered at the gymnasium office, immediately upon arrival at the College.

Good second-hand uniforms of outgoing girls will be for sale at about \$4.00, while the new uniforms cost \$5.00.

Special Work in Physical Education.

Students permitted to pursue special work in Physical Education for the purpose of teaching, should elect classes in regular and corrective gymnastics besides Aesthetic and Folk Dancing and various kinds of outdoor sports. It should be noted, however, that only under special circumstances will such free election of courses be allowed.

In addition to the practice work, the following courses in theory are advised for students permitted to pursue this special work:

Physiology, Elementary and Advanced.

Hygiene, Personal and School.

Anatomy.

Biology, Elementary and Advanced.

Home Nursing.

Psychology.

English and English Literature.

German (knowledge sufficient to read and study medical works).

Education.

Sociology.

Bacteriology.

Physics (Elementary).

Chemistry (Elementary).

Play and Playground Games.

Public School Methods and Practice Teaching.

COURSES IN PHYSICAL EDUCATION FOR WOMEN.

Required Courses.

In the regular courses in Elementary and Intermediate Gymnastics a variety of work is taught. Both the Swedish and German systems of gymnastics are used, and the best in both is adapted to the needs of the classes. Much emphasis is laid on correct posture and breathing. The following order is usually observed: (1) tactics; (2) exercises which include all the groups of muscles, taken free hand or with light hand-apparatus (wands, dumb-bells or Indian clubs); (3) apparatus exercises for those physically adapted; (4) recreative work at the end of the lessons, games, or fancy steps.

5. Elementary College Gymnastics; first semester; four hours a week.

6. Elementary College gymnastics; second semester; four hours a week.

Prerequisite: Course 5.

7. Intermediate College Gymnastics; first semester; four hours a week.

Prerequisites: Courses 5 and 6.

8. Intermediate College Gymnastics; second semester; four hours a week. Participation in the Annual Pageant is a requisite for the completion of this course.

Prerequisites: Courses 5, 6, and 7.

(It will be noted that unless it is necessary for a student to take corrective gymnastics, she will be allowed to substitute for two periods of the above courses two periods a week in the elective courses described below.)

10. **Hygiene.** A course for women students similar to Physical Education 19 as given for men.

Freshman year; first or second semester; $\frac{1}{2}$ credit.

Elective Courses.

26. **Corrective Gymnastics.** Open to all students who have need of remedial work. Special attention is given to those having spinal curvature, round shoulders, narrow chests, forward heads, weak backs, pronated ankles, and other physical defects or weaknesses.

27. Outdoor Sports. Open to all students physically qualified. In this course are taught a variety of games, including baseball, indoor baseball, soccer, playground ball, cross ball, track athletics, and relay racing. In the rainy season games are played in the Armory.

One, two, or three periods a week.

28. Basket Ball. Open to students physically qualified. In good weather the games will be played outdoors.

One period a week for each class throughout the year.

29. Soccer. Open to all students physically qualified.

One period a week in the spring and fall.

30. Baseball. Open to all students in spring and fall seasons.

One period a week.

31. Indoor Baseball. Open to all students during indoor season.

One period a week.

32. Hockey. Open to all physically qualified.

One period a week in the spring and fall.

33. Cross Ball. Open to all students physically qualified.

One period a week during the outdoor season.

34. Tennis. Courts will be assigned to those who wish to play regularly.

35. Swimming. One or two lessons a week are allowed each student.

36. Fencing. Open to all students.

One period a week during indoor season.

37. Indian Clubs. Open to all students.

One period a week during indoor season.

38. Aesthetic Dancing. (Elementary.) Open to all students. The purpose of this course is to develop grace and freedom of movement. Classic dancing, which is now considered one of the most important phases of gymnastic exercise, is emphasized.

One or two periods a week.

39. Aesthetic Dancing. (Intermediate.) Open to all students who have completed course 38.

One or two periods a week.

40. Folk Dancing. Open to all students. In this course are taught a variety of peasant and national dances suitable for recreation or teaching.

One period a week.

41. Theory of Gymnastics. Open to students interested in the teaching of school gymnastics. This course is elementary, but gives an insight into public school conditions and methods of teaching practical gymnastics. Practice teaching with children from public schools.

Two periods a week for one semester; 2 credits.

42. Theory of Gymnastics. Continuation of course 41, and open to all students who have completed course 41.

Two periods a week for one semester; 2 credits.

43. Play and Playground Games. Open to all students. This course is designed for public school teachers or students interested in playground work, or wishing to specialize in Physical Education. The psychology of play, adaptation of play to varying ages, necessity of supervision of play, simple equipment for school playgrounds, organization of games, will be given briefly. The greater part of the time, however, will be given to the practice of various playground games and simple folk dances.

Five periods a week for one semester; 2 credits. (Summer School course.)

44. Archery. One period a week in outdoor season.

45. Theory of Playground Supervision. One period a week for one semester. 1 credit.

MILITARY SCIENCE AND TACTICS.

MAJOR McALEXANDER
POST COMSY. SGT. DUGGER
SGT. MAJOR HAYES

The Oregon Agricultural College was founded in pursuance of three lines of national legislation. The first of these was the Act of Congress known as the Congressional Land Grant Act, of July 2, 1862, and the Acts supplemental thereto, for the establishment of colleges "where the leading object shall be, without excluding other classical and scientific studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts."

The absolute dependence of the College upon the benefactions of the Nation and the State imposes a particular obligation on all who enjoy its privileges. The College, on its part, conforming to the spirit of law, has provided for an efficient system of military instruction, and the Corps of Cadets is entitled to the loyal, zealous, and true support of each and every student in the College. That it receives that support each year will be best evidenced by the standing which the corps attains among the military organizations of the higher universities and colleges.

The Congressional Land Grant Act of 1862 requiring military instruction, was passed during a critical period in the life of the Nation while it was engaged in a civil war. The best of evidence was then at hand showing the need of trained citizen soldiers prepared at all times for service in the cause of the Nation. The object of the law, therefore, was to provide well-trained citizen soldiers. The object has been successfully met. Students enrolled in the Military department may attain a high state of military proficiency, if the spirit, as well as the letter of the law, is followed out during the prescribed course, thereby fulfilling a duty to the Nation, the State, and the College.

The military body of this College consists of one regiment of infantry having three battalions of four companies each, a hospital corps and signal corps detachment, and a band of fifty instruments. The drill and administration are the same as in the Regular Army.

One of the objects of this instruction is to prepare the cadet so that upon graduation he will be thoroughly competent to hold a commission in the National Guard or volunteer army.

The greater part of the instruction is directed toward having cadets adopt a systematic rule of conduct inculcating accurate methods in everything they undertake. This not only places cadets in the condition to receive favorably all instruction in the military department, but facilitates study in the other departments, and becomes a valuable asset to a young man going out into the world in any profession.

Military drill improves the habits and manners of the student, develops him physically, and gives him that military knowledge which it is desirable every citizen should possess in order that he may render intelligent aid to his country or state in time of need. It cultivates a manly spirit, ready and implicit obedience, respect for authority, and self-restraint—all qualities of inestimable value to a young man in whatever calling he may select.

Instruction in the course is prescribed for all undergraduate male students. The instruction is both practical and theoretical.

The new armory contains a drill room 120x300 feet in extent, ample office room, and suitable rooms for storing guns and other ordnance.

Eight hundred and forty modern U. S. magazine rifles (Krag-Jorgensen), with equipment and ammunition, are furnished by the U. S. government. Other necessary accoutrements and apparatus for the thorough equipment of the military department are furnished by the College.

Appointment and promotion of officers and non-commissioned officers, and their relative rank in each grade, are determined according to the military standing of the cadets, based upon a careful consideration of the following points: knowledge of drill and other duties, as determined by examination, practical application of this knowledge on the drill field, and recommendations of superior officers; zeal, soldierly bearing, and aptitude for command; character; military record; general standing in College.

Commissioned officers are selected from the senior class or from such students as have had three or more years of drill; non-commissioned officers, from the junior and sophomore classes; all reductions are to the grade of private. All appointments and promotions are made by the Commandant, with the approval of the President of the College.

Work in military drill is required of all male students of the institution, including all regular degree students, and all vocational, special, and optional students, four periods a week

throughout their undergraduate course. Senior privates may, however, upon petition approved by the President of the College, be excused.

One credit a semester is allowed for military drill, and grades are reported at the end of each semester the same as in any other subject.

Students physically unable to participate in the regular military drill may be assigned by the Commandant to light duty in the department.

Persons transferring to the Oregon Agricultural College with advanced credits from other educational institutions of equal rank will not be exempt from the military requirements, but will be required to offer an equivalent of credits for the back military credits represented or accumulated.

Persons presenting credentials for military work taken at other educational institutions, or for service in the U. S. Army, may be given credit for such work in so far as it is deemed equivalent to the requirements of this institution.

If for any reason a student is relieved from the military requirements, except as specified above, other credits must be substituted therefor.

The practical course in infantry includes the School of the Soldier; School of the Squad; School of the Company; School of the Battalion; School of the Regiment; Ceremonies; Intrenchments; Guard Duty; and Combat. The practical course in the Field Service Regulations will include the Service of Information and the Service of Security. The practical work in Small-arms Firing will include instruction preliminary to gallery and range practice; gallery practice; and range practice. A gallery range with four targets has been built and an outdoor range with four targets is being built. The instruction also includes company administration, camp sanitation, and map reading.

Paragraph 24, General Orders No. 70, War Department, November 18, 1913, directs that, "Upon occasions of Military Ceremony, in the execution of drills, guard duty, and when students are receiving any other practical military instruction, they shall appear in the uniform prescribed by the institution. They shall be held strictly accountable for the arms and accoutrements issued to them."

The wearing of mixed civilian and uniform clothing is prohibited. The commandant has general charge of all matters per-

taining to the uniform at all times. The uniform complete, including the regulation tan shoes, costs about \$19.45; it is of the regulation olive-drab color adopted by the United States Army, and makes a very neat and serviceable suit. It consists of an olive-drab cap with ornament, an olive-drab blouse with collar ornaments, a pair of olive-drab breeches, an orange colored hat band, an orange colored breast cord, a pair of canvas puttee leggings of the new design, a pair of olive-drab gloves, a pair of marching shoes as adopted by the United States Army, and an olive-drab shirt. It is not advisable to purchase any of these articles before entering College, as the necessary uniformity in style, material, etc., makes it necessary to insist upon articles that conform to the standard set by the department. All of these articles can be purchased cheaper here than they can at other places on account of special arrangements made.

Students must come prepared to deposit the price of the uniform, for which they will be measured as soon as they learn the position of a soldier.

Proficiency in Military department is a requisite to graduation.

Military Drill 1. Freshman year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 2. Freshman year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 3. Sophomore year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 4. Sophomore year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 5. Junior year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 6. Junior year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 7. Senior year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 8. Senior year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 9. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. First semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 10. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. Second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill A. First semester; first year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill B. Second semester; first year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill C. First semester; second year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill D. Second semester; second year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill E. First semester; third year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill F. Second semester; third year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Special and optional students will be given credits in military drill as indicated above for undergraduate students. For their first semester's drill work they will be given credits in Military Drill 1. For their second semester's drill work they will be given credit in Military Drill 2. In the following years they will be given credits correspondingly.

1. Theoretical Instruction. This instruction consists of recitations in Infantry Drill Regulations, Field Service Regulations, Manual of Guard Duty, and Army Regulations; instruction in military correspondence and reports and returns; lectures on military subjects that pertain to the organization and administration of the United States military forces in peace and in war; and the Military Policy of the United States.

Military Science 1. Junior year; first semester; 1 credit; 1 recitation or lecture.

Military Science 2. Junior year; second semester; 1 credit; 1 recitation or lecture.

The Brodie Banner is a richly decorated silken banner that is carried by the best drilled company as a mark of merit. Each year it goes to the company making the highest total number of credits in competitive drill. Company E carries the honor for 1914-15.

COLLEGE EXTENSION.

The complete mission of the Oregon Agricultural College, as understood by those who are charged with the direction of its efforts and the determination of its policies, is to serve the people of the State. This service clearly extends to those who come to its campus and claim the advantage of its instructional work. But its mission does not end there. It is concerned also with the interests of all who may be in a position to benefit from its assistance. In the prosecution of this conception of the mission of the College, the Extension Service is charged with the task of extending to the people of the State the advantages of their institution.

A valuable service in the form of institutes, lectures and demonstrations, demonstration trains, the preparation and distribution of bulletins, and cooperative work in connection with private and community interests has been maintained by the institution for a number of years through the efforts of the authorities and staff members of the College and Experiment Station. The Extension Service, by giving exclusive attention to these phases of the College's activities, coordinates and directs the efforts of the various departments in their endeavor to meet the growing demands made upon the College for this type of work.

Extension Subjects. Extension teaching is concerned with all instruction given by the College which is not classified as a part of the regular resident work. The subjects which are included in the extension work are, therefore, all the subjects taught at the College which are of such a nature as to lend themselves to extension methods. While the College, in the past, has been exclusively concerned with agricultural and domestic science and art extension, it has now provided for extension work in all lines of instructional effort. In addition to all the various branches of agriculture which include agronomy, horticulture, gardening, animal and poultry husbandry, dairying, entomology, and other related subjects, extension instruction is being given in domestic science and art, forestry, mining engineering, mechanical engineering, electrical engineering, highway engineering, commerce, education, and other scientific and industrial subjects. While it is clearly impossible to attempt to give complete and full courses in the great majority of these lines of work, there is much that is practical, usable, and valuable that can be taught through extension methods. It is, then,

only such branches of the College work as can be effectively taught without residence requirement, that will come within the scope of extension work.

Extension Agencies. The agencies, which the College uses in disseminating information among the people of the State, are as varied as the conditions which have to be met in carrying out the work.

The plan now in operation includes the use of institutes, movable schools, lectures, demonstrations, and demonstration trains, as one distinct group of extension methods. The institutes include the farmers' institutes, teachers' institutes, and special institutes, such as are held in connection with picnics, banquets, and other public or semi-public gatherings. The movable schools consist of a staff of lecturers, numbering from three to ten, who go out from the College equipped with portable laboratories for demonstrating their work, and who remain in each of the various communities from three days to a week. The lectures are given upon request at any of the many occasions when the service of some member of the College staff may be of value. Demonstration trains are run from time to time in cooperation with the railway companies. They vary in the scope of the work undertaken from a single car to a full train equipped to demonstrate many lines of work. By these methods, the College endeavors to extend directly to those who cannot come to it the advantages of its instruction.

In the second group are the correspondence courses. The plans provide ultimately for such courses in all the lines of work given at the institution which may be taught by this method. At present four courses are offered by correspondence; namely, (1) Shop Drawing—designed to meet the requirements of journeymen mechanics and trade apprentices; (2) Gas Engines, a course of instruction for those desiring to become familiar with the construction, care, and operation of the smaller sizes of gasoline engines; (3) Electricity and Magnetism—a course for electricians and others engaged in branches of electrical business; (4) Commercial Course—covering the subjects of (a) Farm Accounting, (b) Rural Economics, (c) Commercial Law. These courses are offered to residents of the State for a nominal fee. Additional courses in other subjects will be added from time to time as demands are made for them.

Cooperative work, bringing the resources of the College, and of the State and Federal Governments, to the aid of the community organizations and individuals, comprises the third division of extension activities. This provides for: (1) The organization and direction of Boys' and Girls' Industrial Club projects in connection with school and county fairs and the State Fair. (2) The support of the Cooperative Dairy Work now conducted by two specialists who spend their entire time in the field encouraging the proper development of the dairy industry in Oregon—one with headquarters at the College and the other with an office at Hermiston. (3) The Educational and Demonstrational Hog Cholera Work which is concerned with the dissemination of information relative to this disease and its control. (4) The Bureau of Markets and Organization which aids in the establishment and direction of cooperative associations both for the purpose of purchasing farm supplies and marketing farm products. (5) The employment of a Farm Management Specialist whose duty it is to make surveys and collect data covering the operation of groups of farms. The object of this work is to determine net incomes and then acquaint farmers with the agricultural practices which have proved most successful under circumstances similar to their own.

It is the purpose of the Extension Service to foster the organization of improvement associations and clubs throughout the State, and to assist them in all work which will tend to improve local conditions. Where these organizations now exist and are doing effective work, the College will cooperate with them in every possible way.

Organizations of this kind are now receiving valuable assistance from the Oregon Library Commission, through the loan of well-selected libraries. The Commission has consented to cooperate with the Extension Service of the College in extending this line of work and making it even more effective. This should encourage the people of the State to study social and industrial conditions, and place within their reach the means by which their interests may be materially advanced.

Extension publications and educational exhibits form the fourth division of the extension work. From this department there are published many bulletins written in clear, simple form, which tell the secrets of applied science and improved methods, and which make it possible for the laborer, the clerk, the farmer, the me-

chanic, and the housewife to ease and vitalize their daily tasks. Helpful articles are also furnished to the newspapers and the magazines.

The exhibits, which it has been the custom of the College to make at the State Fair, will be enlarged, and as funds become available for the purpose others will be prepared for county fairs, association meetings, and conventions. These will be in the form of educational demonstrations.

One of the most important features of the College extension service, as provided for by laws passed in the 1913 Legislature, is the county farm management and demonstration work in agriculture. The new legislation authorizes the county court of each of the several counties of the State to provide and appropriate funds, either by special provision in the annual tax levy or by an appropriation of funds not otherwise appropriated, to be used in field work in agriculture and in promoting farm demonstration work in such county.

This law is responsible for the placing of county agricultural agents in such counties as have taken action under the law. These agents, under the direction of the Agricultural College, arrange for and carry on cooperative farm demonstration work with farmers in various sections of their respective counties; they study conditions, and advise with farmers as to the crops best adapted to their locality and the best methods in agricultural practice; they study marketing problems and assist the farmers in planning for the most profitable disposition of their products; they aid the teachers of the public schools in giving proper instruction in agricultural subjects, and help to interest our young people in country life, directing their energies into the proper channels. In short, the county agents are traveling agricultural evangelists devoting their time to improving country conditions and country life. It is their ambition to combine the results of scientific discovery with the best experience of practical farmers, and apply them to existing conditions.

Present Organization. During the next year the extension work will be organized and prosecuted according to the laws passed by the 1913 session of the State Legislature and in accordance with the provision of the Smith-Lever bill recently enacted by Congress. This will be along the lines above indicated and to as great an extent as funds and conditions will permit. The College extension

staff will be enlarged, and it is hoped that a greater number of the counties will take steps in the very near future to provide for the county field and demonstration work.

In the meantime, the College will continue to offer lectures, hold institutes, cooperate with the railway companies in running demonstration trains, publish extension bulletins, cooperate with the school authorities of the State in the advancement of industrial education, offer some courses by correspondence, prepare and circulate exhibits, furnish many valuable articles to the newspapers and magazines, and conduct demonstrations on farms and in the orchards of the State.

How to Apply. All persons or communities in the State wishing assistance in any of the lines indicated, should communicate with the Extension Department as far as possible in advance of the time the service is desirable. Short notice requests may not find the department in position to render the best service. If an institute is desired, be sure to give all particulars pertaining to the time, the nature of the subjects in which the community will be interested, the number of speakers desired, and the plans for the meeting. If a single lecture or demonstration or exhibit is wanted, be equally prompt and explicit.

It must be remembered that the College is willing at all times to help all who apply, but that its staff, facilities, and funds are limited, and so it sometimes is unable to give aid where it would like most to give it. However, the College can serve in the great majority of cases and is always ready and glad to do so.

Any county desiring to organize under the provisions of the law for agricultural field and demonstration work and the support of a county agriculturist should communicate with R. D. Hetzel, Director of Extension at the Agricultural College, in order to determine the best methods of procedure.

SCHOOL OF MUSIC.

PROFESSOR GASKINS
MRS. GASKINS
MR. BEARD
MRS. RESSLER
MR. HELLIER-COLLENS
MISS BLOUNT
MR. ALLEN

The advantage of studying music with instructors skilled in the psychology and practice of teaching cannot be overestimated. It results in an appreciable saving of time and expense and a maximum gain in efficiency. Hence the School of Music offers the following comprehensive courses of study to earnest students who wish to acquire scholarly musicianship at moderate cost. The courses may be begun at any time during the school year. All students may advance as rapidly as is consistent with good scholarship. The time required for completion of any of the courses is dependent upon the age, previous preparation, talent, ability, and character of work of each student.

In these courses the following subjects are included: elements of music, history of music, interpretation, languages, music form and analysis, music pedagogics, song singing, oratorio singing, opera singing, choral singing, organ playing, organ structure, piano playing, piano structure, sight reading, stage deportment, stringed instrument playing, wind instrument playing, brass instrument playing, theory, harmony, counterpoint, composition, voice culture. Outlines of the courses:

1. Voice. Exercises will be given for correct breath control; purity of tone production; freedom of action and blending of registers; articulation and correct pronunciation and enunciation of vowels and consonants; elements of phrasing and style. Students must appear on programs if requested, singing from memory, and attend all rehearsals and recitals unless otherwise instructed by the Director.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; sight reading and ear training, two hours a week; harmony and history of music, two hours a week each; choir and chorus practice. Physical education.

2. Voice. This course consists of exercises for tone placing; phrasing and style; legato, marcato, and portamento delivery.

Physiology of the vocal mechanism. First year German, Italian or French, at student's option unless otherwise advised by the Director. Songs and exercises of medium grade of difficulty. Attendance at recitals and rehearsals required, unless otherwise directed as above.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; harmony and counterpoint, two hours a week each; German, Italian or French, as required in beginning work by the department of Modern Languages; physical education; choir and chorus practice.

Prerequisite: Course 1 or its equivalent.

3. Voice. This course includes the study of tone color, agility, the trill, *messa di voce*, recitation, declamation, phrasing, style, through the use of songs in English, German, French, Italian; the regular second year study of one of the above foreign languages at the student's option, in the department of Modern Languages, unless otherwise advised by the Director. Attendance at recitals and rehearsals required unless otherwise directed as above, singing from memory on programs of the School of Music when so required.

Required: Two lessons a week in voice; two lessons a week each in advanced harmony and harmonic analysis; German, French, or Italian, at student's option, second year study as required in department of Modern Languages; choir and chorus practice; physical education.

Prerequisite: Course 2 or its equivalent.

4. Voice. This course includes advanced study of vocal technique by means of difficult exercises, songs, oratorios, operatic arias, declamation. Advanced composition throughout the year. Attendance at rehearsals required in preparation for public appearances, and at recitals, singing from memory. For graduation a public recital must be given as arranged by the Director, unless he may specify to the contrary. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 3 or its equivalent.

5. Piano Preparatory Course. For Beginners. Training of the hand, fingers, wrist, and arm. Extended preparation for scales and arpeggios; exercises for same. Chords. Octaves. Sonatinas by Clementi; Kuhlau; smaller compositions of Mozart, Handel,

Beethoven, and other composers. Easiest sonatas of Haydn and Mozart. Selections from easier works of Schumann, Kulak, Reineke, and Grieg; other easy, appropriate compositions.

Required: Two lessons a week in piano; practice with instrument, one to three hours daily.

6. Piano. Scales and arpeggios, tempi, accent, nuance, rhythm. Double notes. Trills, Exercises for endurance, speed, accent, and rhythm. Etudes from Czerny, Cramer, Kullak, Krause, two-part inventions and dance forms by Bach. Easier sonatas of Haydn, Mozart, Beethoven. Easier compositions of Mendelssohn, Schubert, Schumann, Grieg, Raff, and others.

Required: Two lessons a week in piano; two lessons a week in harmony; two lessons a week in music history for thirty-six weeks; practice with instrument, two to four hours daily. Physical education.

Prerequisite: Course 5 or its equivalent.

7. Piano. Two- and three-part inventions and suites by Bach. Etudes of Czerny, Cramer, Hasert, Bernes. Sonatas of Beethoven of moderate difficulty. Sonatas of Mozart. More difficult selections from Weber, Mendelssohn, Schumann, Chopin, Grieg, Liszt, Mozart concertos; transposition of easy hymns; to sight read readily; to play from memory five compositions from the preceding course in a satisfactory manner.

Required: Two lessons a week in piano; two lessons a week for thirty-six weeks in advanced harmony; one lesson a week in counterpoint; practice with instrument three to five hours daily. German or French. Physical education.

Prerequisite: Course 6 or its equivalent.

8. Piano. Collegiate Course: Well-tempered clavichord, chromatic fantasy and fugue, Bach. A limited number of etudes by Rubenstein, Chopin, Henselt. The more difficult sonatas of Beethoven. Solo works of Mendelssohn, Chopin, Schumann, Grieg, Liszt, Brahms. Concertos by Mozart, Mendelssohn, Beethoven.

Required: Two lessons a week in piano; practice with instrument three to five hours daily; two lessons a week in composition; one hour a week in harmonic analysis; German or French. Physical education.

To complete this course satisfactorily the student must fulfill the requirements above outlined and appear in programs when requested by the Director.

9. Piano. Graduate Course: Beethoven sonatas Op. 57, 106, 110. Liszt Rhapsodies. More extended study of the principal classics and romantic composers. Solo works of modern composers. Concertos by Schumann, Chopin, Beethoven, and other composers.

Following is the list of graduate course pieces of which the student must play six from memory: Wagner-Liszt—Tannhauser March; Chopin—Scherzo in B Minor, op. 31; Mendelssohn—Rondo Capriccioso, op. 14, Prelude and Fugue in A Minor; Variations Serieuses; Schumann—Kreisleriana, op. 16, Carnival, op. 9; MacDowell—Marzwind and Wald Idyllen, op. 19, Nos. 1, 3, and 4; Bach—Fugue in A Minor, or his Italian Concerto; Handel—Suite in D; Moszkowski—Caprice Espagnol, op. 37; MacDowell—Concert Etude, op. 36; Grieg—Ballade; Liszt—Liebestod (Tristan and Isolde), Bach—Chromatic Fantasy and Fugue; Mozart—Fantasia in C Minor; Rubenstein—Sonata in F; Beethoven—Sonatas to be selected. Concertos by Chopin, Henselt, Hummel, Liszt, MacDowell, Mendelssohn, Mozart, and Saint-Saens, or five other works at teacher's option.

Required: Two lessons a week in piano; practice with instrument three to five hours daily; advanced German or French. For graduation, students are required to perform publicly under the direction of the School of Music, playing a program not less than one hour in length, arranged by the instructor and approved by the Director, which shall include two or more numbers equal in difficulty to any composition in the list of graduate course pieces. A diploma will be issued upon the satisfactory completion of this course.

10. Theory. The course in theory will comprise systematic and progressive study in the elements of music. Consideration will be given to the theories of acoustics, to notation, scales, keys, modes, sight reading, intervals, melodic progression, tempo, dynamics, rhythm, and ear training. Advanced theory will embrace harmony, counterpoint and subdivisions thereof, music history, concluding with form, composition, and orchestration.

11. Violin. This course is preparatory, and designed to develop correct fingering, free bowing, and accuracy as to pitch and rhythm.

Studies. Sevvick School, Greenberg, major scales, minor scales in the first position; studies by Wohlfahrt, Kayser, Hime, ele-

mentary solos; special sight reading duos by Mazas and Dancla. Other appropriate studies may be substituted for the above, if approved by the Director, as acceptable equivalents, the same to be satisfactorily performed before entering Course 12.

Students must appear in public recitals when required, playing from memory.

Required: Two lessons a week, harmony, music history, as in Course 6.

12. Studies by Kayser, Wohlfahrt, Schradieck, Mazas, Dont, and Kreutzer. Scale by Hrimaly and Schradieck or acceptable equivalents. Suitable solos, concertos, sonatas, etc. Students must appear in performance at public recitals when required by the management, playing from memory.

Required: Two lessons a week, harmony and counterpoint.

Prerequisite: Course 11.

13. This course consists of advanced studies by Dancla, Fiorillo, Singer, Rhode, Gaviniés, Paganini; solos by Dvorak, Brahms, Vieuxtemps, Rovelli, Spohr, De Beriot, Viotti, Wieniawski, or other acceptable equivalents. Students must appear in public recitals when requested, playing from memory.

Required: Two lessons a week, harmonic analysis, composition, German or French, as in Course 8. As a qualification for graduation students are required to perform publicly, under the direction of the School of Music, a program not less than an hour in length, arranged by the Instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 12.

The Orchestra. Students of stringed instruments in attendance at the College, who are sufficiently advanced, may be admitted to membership in the College Orchestra by arrangement with the Conductor on such terms as may be approved by the Director. It is the intention of the management to encourage in every reasonable manner the development and maintenance of a good orchestra under competent, progressive leadership. Students are invited to investigate these opportunities for excellent training in orchestra routine and solo playing. Such experience and thorough drill are of great educational and cultural value. No student able to play fairly well should fail to avail himself of this training.

The Orchestra library consists of works by the following composers: Dvorak, Brahms, Tschaiowsky, Grieg, Gounod, Verdi, Mendelssohn, Beethoven, Elgar, Wagner, Offenbach, Strauss, and others.

Ensemble: Sonatas for violin and piano; string trios; quartettes for two violins, viola, and 'cello; and for four violins, will be studied. All students in the above classes, or registered in any of the above courses, must perform in public when requested by the Instructor and approved by the Director. Membership in the ensemble classes is free, and instruction is to be given by the principal violin instructor.

BAND INSTRUMENTS.

Instruction will be given by the regular College band leader in the use of brass, wood-wind, and percussion instruments.

To become a member of the College Band, a student must pass a satisfactory examination in the elements of music and ability to perform on his instrument.

Members are required to attend rehearsals each school day, and a reasonable amount of individual practice is expected.

There is no charge for instruction in the band. Each member must furnish his own instrument and music stand, except basses, baritones, altos, and drums, whose instruments are furnished by the College.

Any student desiring to enter the band should see that his instrument is in low pitch.

The courses for the various band instruments are as follows:

14. Cornet. Methods by Arbou; characteristic studies by St. Jacome.

15. Clarinet. Methods by Dieppo; studies by Dieppo and Blume.

16. French Horn. Methods by Franz; studies by Franz and Hayffman.

17. In all other band instruments, including the oboe, bassoon, saxophone, alto, and bass clarinets, drummer's trapps, xylophone, and orchestra bells, the courses will be similar to those given above.

The work in theory required to complete these courses is that outlined for piano courses 6 and 7.

18. Theory. The course in theory will include systematic and progressive study of the elements of music; acoustics, notation, scales, keys, modes, sight reading, intervals, melodic progression, chords, rhythm, dynamics, and ear training.

Advanced theory will include harmony, counterpoint and subdivisions thereof, harmonic analysis, form, composition, and orchestration.

GENERAL INFORMATION.

Any student in the Oregon Agricultural College with a satisfactory record in scholarship in his major course may take at least one hour a day in music.

Students in the School of Music may enter classes in the several departments of the College; and in order to enhance their general culture are encouraged to take at least one study throughout the school year other than the work required in the regular music courses.

Applicants for instruction may take complete or partial courses. Those registering for the former are classified as "regular music," while the others are classified as "special music."

"Special Music" students have the option of selecting such music studies as they desire by registering for the same with the Director in the regular manner and at the catalogue rate of tuition.

Non-resident young women are required to live in the dormitories, where their conduct is subject to the approval of the Preceptress. Outside rooming and boarding places may be obtained, subject to the approval of the College authorities. The rates for board and room are listed elsewhere in detail.

Students registered for study in the regular courses of the Oregon Agricultural College School of Music are subject to the same rules and regulations as all regular students in other courses.

No student is permitted to omit lessons or practice without sufficient excuse, and no refund will be made for absence from lessons or practice or for discontinuance, except in cases of severe personal illness; for such unavoidable absence, lessons may be made up only by appointment, and before the expiration of the term.

Lessons falling on legal holidays, or on special holidays petitioned for by the student body or by special student organiza-

tions, which may be granted by the College authorities, **will not be made up.**

Students will not be permitted to transfer tuition accounts to others, nor to receive credit for tuition fees beyond the assigned registration period, except in cases of severe personal illness, attested by a physician, or similar extreme necessity, and then only by making suitable arrangements with the Director.

The College year in the School of Music consists of thirty-six weeks, divided into terms of about twelve weeks each, the first term beginning at the opening of the College on September 17, 1915.

Private individual instruction is given in lessons of thirty minutes each, in all departments of the School of Music. Class instruction in theoretical branches is required of candidates for graduation, as specified in the preceding outlines of courses. Terms for instruction are as follows:

Voice Culture and Singing—Professor Gaskins, private instruction:

One lesson a week, a term.....\$15.00

Two lessons a week, a term..... 30.00

Organ—Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....\$24.00

Two lessons a week, a term..... 48.00

Piano—Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....\$15.00

Two lessons a week, a term..... 30.00

Piano—May Babbitt-Ressler, private instruction:

One lesson a week, a term.....\$15.00

Two lessons a week, a term..... 30.00

Piano—Instructor Corinne Blount, private instruction:

One lesson a week, a term.....\$12.00

Two lessons a week, a term..... 24.00

Violin, Violoncello, Viola—Instructor Hellier-Collens, private instruction:

One half-hour lesson a week, a term.....\$15.00

Two half-hour lessons a week, a term..... 30.00

Mandolin, Banjo, Guitar—Instructor Allen, private instruction:

One half-hour lesson a week, a term.....\$12.00

Two half-hour lessons a week, a term..... 24.00

Band Instruments—Instructor Beard, private instruction:

One lesson a week, a term.....\$10.00

Two lessons a week, a term.....20.00

Music History—Professor Gaskins, class instruction:

Two hours a week, a term.....\$ 3.00

Harmony, Counterpoint, Harmonic Analysis—Instructor Blount;
class instruction, classes limited to six students:Each subject two hours a week; tuition for each sub-
ject, a term\$ 7.50**Composition (including Form), Orchestration**—Instructor Blount,
class instruction, classes limited to six students:

Two hours a week; each subject, a term.....\$ 7.50

PRACTICE.

Rooms located in one of the College buildings have been suitably furnished for the use of students wishing to practice in private. These rooms may be rented for about one-third the cost of using pianos located in private houses, and without any of the disadvantages that must be endured in private homes. These practice rooms, with steam heat, good ventilation, good light, electric illumination for night practice, and good janitor service, are furnished with good pianos, kept in tune by the College. Students living in the College dormitories are required to practice upon these pianos. Students living away from the campus may arrange with the Director for practice on the same terms and conditions, as follows:

Piano—

Term of twelve weeks, one hour a day.....\$ 5.00

Two hours 7.50

Three hours 10.00

Four hours 12.50

Five hours 15.00

Organ—

Term of twelve weeks, one hour a day.....\$12.00

Two hours 18.00

The pipe organ is a new, modern Kimball two manual, concave pedal board instrument of beautiful tone.

For additional information address William Frederic Gaskins, Director, Administration Building, Oregon Agricultural College, Corvallis, Oregon.

SUMMER SESSION.

The chief purpose of the Summer School is to afford an opportunity for study to those unable to attend during the academic year. The courses are arranged for elementary and secondary teachers interested in Agriculture, Commercial branches, Home Economics and Manual Training; for credit in regular college subjects, as well as for prospective students deficient in entrance credit; for those interested in music and art; and for those desiring practical instruction in agriculture, household economics, and woodwork.

It is thought advisable to arrange for a series of two-weeks courses in addition to those continuing six weeks. They are provided for students who will not find it possible to remain longer than two weeks and are so planned that practically the entire time each day will be devoted to each special line of study. Should any decide to continue through the remaining four weeks of the summer session, a number of six-weeks courses, conducted on the topical method, will admit of the entrance of students with profit.

Of special interest is the inclusion in the two-weeks calendar of courses for boys and girls of upper grammar grades and high school age. At this formative period, an opportunity to study in an interesting way the problems of the two great fundamental occupations should arouse new ideals of the beauty, importance, and significance of such callings. The romance, as well as the dignity of agricultural and home pursuits have their appeal to youthful imagination, but ordinary school education, both consciously and unconsciously, places the emphasis on the professions and occupations leading to a public career.

A large faculty, chiefly regular College instructors, supplemented by a number of specialists from Oregon public schools and from other states, the extensive equipment in class rooms, laboratories, libraries, shops, and experimental fields, are at the service of the students.

The state-wide interest in garden and household contests of the public school pupils has resulted in a demand for more knowledge of these industrial subjects on the part of the teachers. The summer courses will not only provide specific and detailed instructions for conducting these contests, but will show the teacher how to use the state-adopted text in elementary agriculture and supplement it with simple and interesting experiments both indoors and outdoors.

In the same way, the direct and practical instruction in cooking and sewing will furnish the essentials for assisting the girl pupils. Any teacher who has had the advantage of six weeks' contact with expert instructors and practical demonstrations in the work in which he is to direct his pupils, will greatly multiply his efficiency and usefulness in his community.

The winter short course comes at a time best suited to the convenience of the farmer. Professional and business men find their slack season during the summer; so also do the youths who are attending school, and the women of the family. The summer school offers them the opportunity of some study of the problem nearest every town dweller's heart—the acquirement of a piece of land and its cultivation. From the standpoint also of the beautification and sanitation of the dooryard and home premises, the kitchen-garden, house decoration, hygienic and economic preparation of foods, and other indoor problems, the summer school makes its appeal. Young men and women who are through high school, and others undecided as to their life work, may find just the leadings in summer study which will determine their future vocation.

RAILROAD RATES.

To those attending the summer school, the railroad companies grant a special rate of one and a third fare for the round trip, on the certificate plan, from all stations in Oregon. In order to receive the benefit of the reduction, the purchaser must pay full fare to Corvallis, **securing a receipt from the ticket agent** at the time of purchase. This receipt must be countersigned by the College secretary at Corvallis, and on presentation to the ticket agent at Corvallis will secure rate of one-third for the return. This special rate takes effect three or four days before the opening date of the summer session and remains in force until the same length of time after the closing date. Tickets on this plan may be secured at any time while the school is in session, and are also good for return at any time. If, for any reason, receipt should not be secured at the time of purchase, get train conductor's receipt, showing the form and number of your ticket. If a through ticket to Corvallis cannot be sold from your station, do not fail to get a receipt for each ticket, even if the fare be paid on the train. The reduced rate is good only within the State; if you live beyond the State line, buy your ticket to a station in Oregon, and from that point to Corvallis.

ADMISSION AND EXPENSES.

There are no entrance examinations or other educational tests for admission. Students desiring College credit must do the required work and pass satisfactory examinations at the close of the session. The registration fee of five dollars and a small laboratory fee to cover the cost of material in some of the courses, are the only charges made for class instruction, and entitle the student to admission to as many courses as he cares to attend during the entire session. Private, individual lessons in music will be given at the regular price charged during the school year; students taking music only, will not pay the College registration fee.

The College dormitories, Waldo for women and Cauthorn for men, will accommodate over two hundred students with board and lodging. A charge of five dollars will be made to cover the cost of heat, light, use of laundry, etc. The rooms are provided with bed, mattress, table, and chairs. Each room has closet, hot and cold water, and electric light. Each student who desires to occupy one of these rooms must bring bed, pillows, pillow-cases, sheets, blankets or comfort, bed-spread, towels, napkins, and soap. The laundry room will be open for the use of students at Waldo Hall without extra charge.

Table board will be furnished at Waldo Hall at three and one-half dollars per week. Lists of private lodging and boarding places will also be provided and every assistance rendered in finding satisfactory accommodations. Furnished rooms for light housekeeping may also be had.

Allowing \$26.00 for board and room, \$5.00 registration fee, and 50c for drayage on baggage, \$3.50 for laundry and incidentals, the minimum cost for the entire six weeks need not exceed \$35.00, exclusive of railroad fare. Those who take courses requiring textbooks must make some additional allowance, and others for small laboratory fees, but it is safe to estimate the absolutely necessary expenses, textbooks and all, under \$50.00.

SOCIAL AND OTHER FEATURES.

The informal and recreation diversions from the class and study routine have not only a social but an educational value as well. These are so controlled and directed as to be inexpensive and unobtrusive. Opportunity for students to become acquainted with each other and with the instructors outside the class room may be had each evening at Waldo Hall, during the informal social hour and at the formal receptions and parties each week.

The College numbers among its faculty some of the best known popular lecturers in the State. Several will be heard in illustrated stereopticon addresses on interesting phases of Oregon's industrial development. At least once each week an evening will be given up to entertainment, either in the form of a lecture of general interest, or a musical concert.

The tennis courts, baseball field, golf course, gymnasium, and other recreation resources of the institution may be used by the students and instructors, free of charge. Boating on the Willamette and Mary's rivers, picnics and excursions to various points of interest, including Mary's Peak, and week-end trips to the ocean at Newport, will also be available for those who desire to indulge in these recreations. The social features of the Summer School are given careful attention, so they may not come in conflict with the regular work, but at the same time be full of pleasure and interest.

COURSES OF INSTRUCTION.

The summer instruction is of two general kinds: the regular College courses, reciting a sufficient number of periods each day to equal the credits of one semester; and **special courses organized** for needs not met by the regular instruction. For the session of 1915, regular courses are offered in Agriculture, Art, Botany, Chemistry, English, Geology, History, History of Education, Mathematics, Modern Languages, Physics, Psychology, School Management. Special courses are offered in Elementary Agriculture, Domestic Science, Domestic Art, Manual Training, Drawing, Music, and Physical Education for teachers; also special courses for those not caring to teach, in Agriculture, Domestic Science, Domestic Art, Woodwork, Music, Art. Provision is also made for the admission to the regular courses of those not desiring College credit, in order that the widest possible freedom of selection may be made.

SPECIAL ILLUSTRATED BULLETIN.

Each spring, special circulars are issued, giving complete description of the various courses offered, statement in detail of living and other expenses, list of instructors, directions for registration, and other matters. These bulletins are illustrated with interesting views of the College campus. Copies may be obtained by addressing the director, Professor E. D. Ressler, or the Oregon Agricultural College, Corvallis, Oregon.

WINTER SHORT COURSES.

For many years the Oregon Agricultural College has offered each winter one or more courses of lectures and demonstrations which have been known as Winter Short Courses. These courses have been so generally successful and have called forth so many expressions of approval from those in attendance, that the work has expanded until several courses are given in each of the following schools:

School of Agriculture.

School of Home Economics.

School of Forestry.

School of Engineering.

School of Commerce.

Each of these courses, except the one in Industrial Arts, which will consist entirely of practical work in the shops or in the draughting room, will consist of a series of lectures supplemented by demonstrations, and by practical exercises in the dairy, the orchard, and the various laboratories. The work is so arranged that each hour of the day, from 8 until 5, may be filled with lectures and laboratory or field demonstrations.

The work offered will be adapted to the various needs of farmers, fruit growers, dairymen, mechanics, or of women in the home. It is believed, also, that teachers who desire to prepare themselves to teach Elementary Agriculture, now required in our public schools, will find these courses decidedly helpful.

The various courses are so planned as to provide the largest amount of practical information in the short time available. The subjects to be discussed are those in which every farmer should be interested, and the aim will be to present them in the most practical manner possible. The laboratories and collections, the shops, the creamery, the orchards, the College farm, the cutting, fitting, and sewing rooms; the dining rooms and kitchens—all offer facilities for demonstration or for practical exercises by the students attending these courses. A pleasing and profitable feature of these courses will be a series of lectures by prominent men who are qualified by successful experience to speak upon some particular phase of Agriculture.

Special lessons in Music may be taken by short course students at the regular rates listed under the School of Music.

Students should report to the Registrar for registration and for assignment to the various classes. The inclusive dates of these short courses are as follows: Farmers' Week, January 3 to 8; Winter Short Courses, January 10 to February 4; Forestry Short Course, November 1 to April 14. A list of boarding and lodging places may be consulted at the office of the Y. M. C. A.

No entrance examination or other educational test will be required; but no one will be received who is less than sixteen years of age. Over twenty-five hundred men and women registered in these courses in 1914-15, their ages ranging from sixteen to over seventy-five.

There will be no fees whatever for attending the exercises of Farmers' Week. Those who attend the other courses will be expected to pay a registration fee of \$1.00. In addition, students who elect certain courses will be expected to pay small fees, to cover the cost of materials used.

Board and lodging may be had in Corvallis at \$4.50 to \$6.00 a week.

Railroad Rates. The railroad companies grant a rate of one and one-third fare for the round trip on the usual certificate plan.

A circular descriptive of all Short Course work will be issued about November 1, and may be obtained by addressing the Registrar, Oregon Agricultural College, Corvallis, Oregon.

SCHOOL OF AGRICULTURE.

The School of Agriculture offers to its Short Course students instruction in the following courses; viz., Agronomy, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Horticulture, and Crop Pests. In addition to these courses, students are advised to take advantage of the courses in Rural Economics which are offered in the School of Commerce, as well as the course in Rural Highways, in the School of Engineering. For more detailed information regarding these courses, write for descriptive circular mentioned above.

COMMERCE.

Commercial Lecture Course. To meet the demand for a short, practical business course, the work outlined below will be offered in a series of lectures under the same conditions and entrance requirements as other winter courses.

Bookkeeping. This course will embrace the fundamental principles of double entry bookkeeping. It will be made strictly practical and only sufficient theory will be introduced to give the student a firm foundation for his work. The basis of the work will be a study of a model general store equipped with the latest labor-saving methods of bookkeeping and office practice. Eight lectures and demonstrations.

Commercial Law. The course in Commercial Law will begin with the thought that there are certain fundamental principles of commercial law with which everyone should be familiar, and will include the following important subjects: property, contracts, negotiable instruments, interest and usury, bailment, agency and partnership, and real estate. Eight lectures.

Business Forms and Letter Writing. The purpose of this course will be to familiarize the student with various forms used in general business practice. Exercises will be required illustrating both principle and practice in a clear, simple understandable manner. In the work on letter writing the correct form, wording, and general arrangement of the business letter will be taken up. Original letters, received from the most important manufacturing concerns and business houses of the United States, will be studied. Eight lectures.

Penmanship. The work in penmanship will embrace the study and practice of the best forms and style of practical business writing. The primary aim of the course will be to develop an easy, rapid, legible business hand. Eight lectures a week.

Typewriting and Office Methods. The work in typewriting will be outlined to suit the requirements of the individual student. The beginner will be taught the correct method of fingering, the uses of the various parts of the machine, the care of the machine, manifold, and the correct arrangement of the typewritten letter or form.

Farm Accounting. A complete analysis of farm accounts by different methods, in which simplicity, accuracy, and labor-saving are emphasized; household and personal accounts; cost accounting and special records; cost of production; special cost records; labor records; milk records; poultry records; etc.; the farm plot; office methods; business organizations; business correspondence and business forms. Eight lectures and demonstrations.

Rural Law. The general principles of common and statutory law are discussed and explained; special phases of law affecting the farm, such as titles to real estate, deeds, mortgages, county records, etc.; landlord and tenant; eminent domain, and right-of-way; water rights and boundaries; laws governing shipping, insurance, banking, etc.; court procedure. Eight lectures.

Rural Economics. The fundamental principles of production, distribution, and exchange with special reference to rural life. Rural labor problems, farm finance, legislative problems affecting rural life, cooperative organizations, marketing products, advertising, the economics of machinery, transportation, etc. Eight lectures.

Insurance. A brief survey of the essential features of the various life, accident, and fire insurance policies and insurance laws. Four lectures.

HOME ECONOMICS.

These courses are designed for all women who are interested in the practical and scientific working out of household problems, and who are unable to avail themselves of a regular course in Home Economics. Many agricultural men and their sons, yearly take advantage of the Short Courses which deal with the problems of the farm, such as feeding of cattle, judging of corn, study of soils, etc. It is to meet the demand of Oregon women who are interested in the correct feeding of the family, the judging and selection of materials used in the home, the making of suitable and attractive clothing, and study of sanitary conditions which lead to the health, comfort, and happiness of the family, that this course has been established, and is to be carried on.

Food Preparation. This course deals with the subject of foods and food preparation in its scientific and economic aspect. It is the study of the nutritive principles as they are found in various foods, and the method of cooking foods to retain those principles in a form most completely and easily digested; serving of food in simple and attractive form; economy of money, time, and labor being the watchword.

Special Food Preparation. This course consists of the selection and preparation of foods for children of different ages, adults in active life, the aged, and invalids.

Home Management.

General health and welfare of the home.

(a) Economy of time, labor, and income.

(b) Sanitation of the home.

(c) Home nursing.

Note.—These courses have been planned to meet the needs of those who have had previous work, as well as those who are entering for the first time.

Plain Sewing. This course is planned for those women wishing instruction in the economical purchasing and making of household linens and underwear; the mending and renovating of old garments usually found in all households; the draughting of patterns for underwear to the student's own measurements, together with the practice of interpreting and using purchased patterns.

All women are eligible to this course.

Dressmaking. This course offers instruction in the principles of dressmaking; the taking of accurate measurements; the draughting and use of patterns; the choosing and economical cutting of materials; the making of at least one dress, with special emphasis on artistic color combinations and suitable design.

Tests will be made showing the adulterations of textiles; and simple methods of detecting the adulterations in dress materials will be given.

This course is given for those women who have had experience in sewing and dressmaking.

Advanced Dressmaking. Students who have previously taken one winter's short course will be given instruction in advanced dressmaking, if they so desire.

Millinery. This work will be given by lectures and demonstrations only. No practice work will be given to the students.

Basketry. This course will be given three times each week.

Care of Children. Three lectures each week will be given on the care of children. Only mature women will be admitted to this class.

Camp Cookery. The course in Camp Cookery consists of two laboratory lessons each week. It is especially designed for men, but women are admitted if the class is not already full. Only twenty students can enter these classes.

ENGINEERING AND INDUSTRIAL ARTS.

It is the purpose to teach the subjects offered in a straightforward, practical manner, which can be readily grasped and understood by farmers, mechanics, and others who have had only the advantage of a common school education.

Woodworking. Considerable latitude will be allowed in choosing the particular line of work desired in this department as set forth under the following headings:

(a) A course for those not familiar with the care and handling of tools. This course affords instruction in the correct methods of using, sharpening, and caring for the tools of the carpenter's bench. The work is exemplified by exercises in planing, sawing, chiseling, and the construction of useful articles of furniture.

(b) The Steel Square and Its Use. This work includes laying out rafters, braces, stairs, and other work with the steel square. Lectures will be given on the use of the square, after which the actual construction of work will be undertaken by the student.

(c) Instruction in the use of paints, stains, and varnishes.

Blacksmithing. Two lines of work are offered in blacksmithing:

(a) Making repairs on machinery, tools, and farm implements. Students with no previous knowledge of blacksmithing are taught how to build and manage a forge fire; how to draw, bend, upset, forge, and weld iron; how to make chains, clevises, hooks, gate-hinges, whiffletrees and neck-yoke irons, and other useful articles.

(b) A course in working and welding steel for those with some general knowledge of blacksmithing. This course includes a study of the different grades of steel; the effect of heat treatment on the quality and temper of steel; the use of the color scale in tempering; and finally the forging, dressing, and tempering of steel tools.

Road Building and Maintenance. A course of lectures on practical road construction and maintenance. This course will consist of three or more lectures each week during the short course on the fundamental principles of road construction and maintenance, and will include lectures on the following subjects: Alignment; grade; drainage; the road census and the interpretation of its results; selection of type of road; the earth, gravel, broken stone, and higher types of roads; maintenance of different types of

roads; the road drag; road machinery; culverts and small bridges, etc.

Special laboratory work will be arranged for those desiring to study the physical properties of road building materials.

Concrete. A course of lectures will be given on the theory of concrete and on its practical application to farm and highway structures, walks, etc. In this course proper proportioning for different classes of work, proper aggregate, causes of failure, costs, and methods will be discussed.

ROSTER OF OFFICERS AND NON-COMMISSIONED OFFICERS OF THE MILITARY DEPART- MENT, O. A. C., JUNE 8, 1915.

COMMANDANT.

P. J. HENNESSEY, 1st Lieutenant, U. S. Cavalry.

ASSISTANT COMMANDANTS.

C. F. DUGGER, Post Commissary Sergeant, U. S. Army, Retired.
DENIS HAYES, Regimental Sergeant Major, U. S. Army, Retired.

CADET REGIMENTAL FIELD AND STAFF.

McFadden, C. L.....Colonel	Ballhorn, Otto.....Capt. & Adjt.
Thomas, G. R.....Lt. Colonel	Meyers, J. D.....Capt. & Qr. Mr.
	Roberts, G. H.....Capt. & Comsy.

NON-COMMISSIONED STAFF AND BAND.

Fox, K. L.....Sergeant Major	Hardman, G. ....Sergeant
Hoerner, G. R...Qr. Mr. Sergeant	McGinnis, G. L.....Sergeant
Michelbrook, R. P. Comsy. Sergt.	Akers, R. ....Sergeant
Laythe, L. L.....Color Sergeant	Holmes, F. A.....Sergeant
Green, J. W.....Color Sergeant	Nash, J. W.....Sergeant
Kennedy, R. D.....Chief Musician	Kenton, R. M.....Sergeant
Archbold, A. C.....Prin. Musician	Luxton, W. L.....Sergeant
Tulley, S. W.....Drum Major	Sather, J. A.....Sergeant
Beck, G. O.....Sergeant	Gillmore, J. E.....Sergeant
Day, R. C.....Sergeant	VonLehe, H. ....Sergeant

FIRST BATTALION.

Olsen, Jens .....Major	Thompson, E. H.....
Dietsch, F. J.....1st Lieut. & Adjt.	Battn. Sgt. Major
Crouter, L. D...2d Lieut. & Qr. Mr.	

CAPTAINS.

Company "A"	Company "B"
Stambach, G. M.	Wilkins, M.

FIRST LIEUTENANTS.

Bixby, C. M.	Strain, C.
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SECOND LIEUTENANTS.

Alworth, E. C.	Middlekauff, M. H.
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FIRST SERGEANTS.

Richards, D. E.

Pearson, R.

SERGEANTS.

Kathan, G. L.

Frest, C. M.

Crouter, P. H.

Romig, F. V.

Bartruff, E. W.

Wetteland, R.

Mosby, D. C.

Whitby, J. H.

CORPORALS.

Carter, J. W.

Blackwell, H.

Boone, E.

Crawford, J. A.

Harris, N.

Davis, P.

Tillery, H. L.

Grubbe, E. E.

Graff, H.

Iasswell, S. S.

Mayhew, S.

Saulding, D. P.

Holdren, H. G.

Hoover, F. W.

CAPTAINS.

Company "C"

Conner, R. M.

Company "D"

Gilbert, H. C.

FIRST LIEUTENANTS.

Klinghammer, R.

Zimmerman, E.

SECOND LIEUTENANTS.

Chambers, G. F.

Francis, G. L.

FIRST SERGEANTS.

Hubbard, C. M.

Koenig, W. J.

SERGEANTS.

Glines, H. W.

Bennett, A. A.

Monger, W. V.

Fendall, V.

Story, C. L.

Floss, F. C.

Baum, O. H.

Vestal, E.

CORPORALS.

Camp, R. H.

Flippin, T. J.

Green, C. C.

Friedman, D.

Gragg, G. M.

Meyers, C. W.

Hooper, J. A.

Overholser, L.

Lance, N. S.

Patton, H. C.

McMinn, R. B.

Schneider, N.

Lindeman, L.

Skelton, A. G.

SECOND BATTALION.

Betzel, I. L. Major Schreiber, M. A.
 Whitby, H. R. 1st Lt. & Adjt. Battn. Sgt. Major
 Laird, R. P. 2d. Lt. & Qr. Mr.

CAPTAINS.

Company "E"	Company "F"
Fowler, R. G.	Gildner, W. F.

FIRST LIEUTENANTS.

Carson, W. G.	Tadlock, H.
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SECOND LIEUTENANTS.

Lamb, H.	Amort, P.
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FIRST SERGEANTS.

Lamoreux, T. L.	Amort, A. A.
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SERGEANTS.

Hyams, L. K.	Fisk, C. E.
Mason, W. H.	Powell, C.
McClellan, T. R.	Archibald, H. G.
Underwood, E. F.	Parrish, R. A.

CORPORALS.

Anderson, Wm.	Harvey, P. A.
Miller, H.	McGogy, P. A.
Robbins, U. G.	Selby, H. E.
Scott, L. M.	Turnbull, J. I.
Taylor, H. R.	Yates, R. B.
Rollins, J. C.	Black, E. P.
Lamoreux, L. A.	

CAPTAINS.

Company "G"	Company "H"
Dallas, W. R.	Paine, J. H.

FIRST LIEUTENANTS.

Macpherson, W. M.	Flanagan, C. B.
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SECOND LIEUTENANTS.

Price, L. D.	Shepard, F. H.
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FIRST SERGEANTS.

Hurley, A. D.	Funk, A. J.
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SERGEANTS.

Moore, M.	Vancouvering, M.
Locker, L.	Taylor, A.
Schubert, B. W.	Foster, A. D.
Johnston, P. M.	Roseman, C. H.
Anderson, A. E.	

CAPTAINS.

Edwards, J. H.	Kruger, H. W.
Spindler, W. A.	Storz, C. W.
Whitehouse, W. R.	Walton, F. W.
Wilkes, C.	Stoneberg, H.
Lawrence, S. E.	Hayes, F. A.
Finch, A. W.	Simpson, J. E. H.

THIRD BATTALION.

Tartar, N. L.....	Major	Vilas, N. P.....	Battn. Sgt. Major
Hewitt, M. S.....	1st Lt. & Adjt.		
Kingsley, E. J.....	2d Lt. & Qr. Mr.		

CAPTAINS.

Company "I"	Company "K"
Johnson, L. R.	Belton, H. C.

FIRST LIEUTENANTS.

Wright, R. V.	Crain, W. W.
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SECOND LIEUTENANTS.

Hackett, H. N.	Johns, M. S.
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FIRST SERGEANTS.

Gerke, W. H.	Burns, R. W.
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SERGEANTS.

Spaulding, H. C.	Loughary, I. H.
Smith, C. F.	Minsinger, D. W.
Lindsay, A. L.	Strome, C. L.
Doerner, A. D.	Eaton, K.

CORPORALS.

Bailey, W. A.	Barnes, C. A.
Fendall, DeV.	Boone, J. C.
Plue, V. L.	Brown, F. B.
Riippa, W.	Kadderly, W. L.
Sessions, P. R.	Lettelier, G. H.
Soo, T. H.	Lowell, A. L.
Wilkes, W.	Moore, L. B.

CAPTAINS.

Company "L"	Company "M"
Chenault, R. G.	King, L. A.

FIRST LIEUTENANTS.

Anderson, E. G.	Aker, H. F.
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SECOND LIEUTENANTS.

Logan, A. E.	Gilbert, M. B.
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FIRST SERGEANTS.

Hathaway, M. H.	Brett, S. E.
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SERGEANTS.

Boies, J.	Allingham, W. D.
Wilson, D. N.	Buchanan, B. B.
Turner, A. E.	Straughn, J. A.
Tweed, R. L.	Mulkey, O.

CORPORALS.

Engbreston, A. E.	Cronemiller, F. P.
Hamilton, J. M.	Jones, L. K.
Jenkins, M. F.	Trempe, J. C.
Turner, J. O.	Leibner, E. C. W.
Werner, J. R.	Henderson, W. W.
Yates, L. D.	Wilson, J. B.
Levage, H. V.	

CATALOGUE OF STUDENTS.

(The following abbreviations are used to indicate the course in which the student is registered and the classification within the course: Agri., Agriculture; C. E., Civil Engineering; Com., Commerce; H. E., Home Economics; E. E., Electrical Engineering; For., Forestry; L. E., Logging Engineering; Hi. E., Highway Engineering; I. E., Irrigation Engineering; I. A., Industrial Arts; M. A., Mechanic Arts; M. E., Mechanical Engineering; Min., Mining Engineering; Phar. Pharmacy; Fr., Freshman; Soph., Sophomore; Jr., Junior; Sr., Senior; F. Yr., First Year; S. Yr., Second Year; T. Yr., Third Year; Voc., Vocational; Opt., Optional; Spec., Special.)

GRADUATE STUDENTS.

Name.	Course.	Home Address.
Alcorn, James Marcus (Kansas Wesleyan University)	Agri.	Brownsville
Allen, Leonard John (Oregon Agricultural College)	Agri.	Cove
Andrews, Alan Kendall (Oregon Agricultural College)	For.	Corvallis
Boothe, Joe Miles (Oregon Agricultural College)	Agri.	Union
Bowerman, Elizabeth (Oregon Agricultural College)	H. E.	Corvallis
Broich, Walter Frank (South Dakota Agricultural College)	Agri.	Bigstone City, S. Dak.
Buchanan, Mildred (Oregon Agricultural College)	Opt.	Corvallis
Corsaut, Jesse Harrison (Kansas Agricultural College)	Agri.	Salina, Kan.
Dowden, Ethelbert, Jr. (Oregon Agricultural College)	Min.	Plainview, Tex.
Edminster, Albert Franklin (Massachusetts Agricultural College)	Agri.	Brooklyn, N. Y.
Elmer, Otto (Oregon Agricultural College)	Agri.	Mulino
Failing, Kate Whittlesey (Oregon Agricultural College)	Agri.	Portland
Hukil, Brooke (Oregon Agricultural College)	Agri.	Corvallis
Hutt, Lewis Thomas (Oregon Agricultural College)	Hi. E.	Yamhill
Hyland, Harold Wilson (Massachusetts Agricultural College)	Agri.	Weymouth, Mass.
Jackson, Caroline Ruth (University of Missouri)	Agri.	Fredericksburg, Va.
King, Will (Oregon Agricultural College)	Agri.	Eugene
Lamb, John (Mississippi Agricultural College)	Agri.	Brookhaven, Miss.

Name.	Course.	Home Address.
McComb, Jessie Dunlavy (University of Nebraska)	H. E.	Corvallis
McFarlane, Mary (University of Wyoming)	H. E.	Salem
Magness, John Robert (Oregon Agricultural College)	Agri.	Amity
Marshall, Roy Edgar (University of Nebraska)	Agri.	Lincoln, Neb.
Mattley, Belle Kate (Oregon Agricultural College)	H. E.	Oregon City
Morgan, Carl (Washington State College)	Agri.	Davenport, Wash.
Nixon, Clara (Oregon Agricultural College)	Agri.	Trumansburg, N. Y.
Philp, Guy Lockhart (Cornell University)	Agri.	Mt. Lebanon, Pa.
Posey, Gilbert Bradley (Maryland Agricultural College)	Agri.	Riverside, Md.
Rinearson, Peter Melvin (Oregon Agricultural College)	Min.	Milwaukee
Rosendorf, Modesta Florence (Oregon Agricultural College)	Opt.	Corvallis
Ruth, Charles Curtis (Valparaiso University)	Agri.	Pendleton
Rutledge, Ralph Merrill (Oregon Agricultural College)	Agri.	Corvallis
Scherer, Christopher Marion (Wabash College)	Agri.	Brookville, Ind.
Schoth, Harry August (Oregon Agricultural College)	Agri.	Oregon City
Schuster, Carl (Oregon Agricultural College)	Agri.	Corvallis
Shirmer, Charles Frederic (Oregon Agricultural College)	Min.	Oregon City
Siefert, William Herbert (Oregon Agricultural College)	Agri.	Pasadena, Calif.
Smart, William Anderson (Oregon Agricultural College)	Agri.	Santa Ana, Calif.
Van Gundia, Gordon (Oregon Agricultural College)	Agri.	Sycamore, Ohio
Watt, John Earl (Kansas Agricultural College)	Agri.	Anthony, Kan.
White, Samuel Kilburn (Oregon Agricultural College)	M. E.	Philomath
Williamson, Robert Vernon (Oregon Agricultural College)	Min.	Wells

UNDERGRADUATE STUDENTS.

Name.	Course.	Rank.	Home Address.
Abraham, Bernice	Com.	Soph.	Roseburg
Abraham, Herman	Agri.	Soph.	Albany
Abraham, Marie	Com.	F. Yr.	Albany
Acheson, Gertrude	H. E.	Jr.	Portland
Ahren, Merrie Ierne	H. E.	Jr.	Hugo
Aker, Homer Ferris	Agri.	Sr.	Chula Vista, Calif.
Akers, Robert	Agri.	Soph.	Portland
Albus, Fred Henry	Phai.	F. Yr.	Aumsville
Alderman, Margaret	H. E.	Fr.	Dayton
Alderton, Ada	H. E.	Sr.	Portland
Aldrich, Winfred	Opt.		Corvallis
Allen, Arma Ruth	Com.	Fr.	Marshfield
Allen, Ethel	H. E.	Jr.	Corvallis
Allen, Frederick John	Min.	Soph.	Cove
Allen, Martin	For.	Fr.	Salem
Allingham, William David	I. A.	Jr.	Corvallis
Allworth, Edward	Com.	Jr.	Crawford, Wash.
Alward, Charles William	Phar.	S. Yr.	Bozeman, Mont.
Amerige, Violette Anna	Opt.		Boston, Mass.
Amesbury, Ruth	H. E.	Sr.	Portland
Amis, Albert Hope	Agri.	Fr.	Los Angeles, Calif.
Amort, Albert Alexander	C. E.	Jr.	Corvallis
Amort, Frank Peter	C. E.	Sr.	Orland, Calif.
Amort, Paul	I. A.	Jr.	Corvallis
Anawalt, Clinton LaVerne	Agri.	Voc.	Jordan Valley
Anderson, Albert Thos.	For.	Fr.	Astoria
Anderson, Archie	Agri.	Jr.	Ashland
Anderson, Edmund	For.	Sr.	Albany
Anderson, Helen Best	H. E.	Sr.	Portland
Anderson, Henry	M. A.	S. Yr.	Aberdeen, Wash.
Anderson, Isaac Milton	Agri.	Sr.	Drewsey
Anderson, Norma	Agri.	Spec.	Portland
Anderson, Joan	Com.	Fr.	Medford
Anderson, William	C. E.	Soph.	Portland
Andrews, Winfield	Agri.	Soph.	San Luis Obispo, Cal.
Anthony, Marie	H. E.	Sr.	McMinnville
Archbold, Alston Conway	E. E.	Sr.	Hillsboro
Archibald, Harold	L. E.	Jr.	Albany
Arens, Winfried Bernard	Com.	Soph.	New York, N. Y.
Armitage, Carleton	Agri.	Jr.	Sunset Beach, Calif.
Asbahr, Catherine	H. E.	Fr.	Cornelius
Ashenfelter, James J.	Com.	S. Yr.	Mikkalo
Atwood, Cyrus	Com.	Fr.	Corvallis
Atwood, Elmira	H. E.	Fr.	Corvallis
Atwood, Ralph	Agri.	Jr.	Corvallis
Ault, Byrd	Agri.	Jr.	Enterprise

Name.	Course.	Rank.	Home Address.
Ault, India	H. E.	Sr.	Enterprise
Austin, Helen	H. E.	Jr.	Aberdeen, Wash.
Averill, Wm. Samuel	Agri.	Soph.	Corvallis
Avery, Ruth	H. E.	Voc.	Klamath Falls
Axtell, Edward Goodchild	Agri.	Soph.	Corvallis
Ayers, A. A.	For.	Soph.	Lacomb
Babbitt, Richard Carrick	C. E.	Spec.	Corvallis
Bailey, Lucile	H. E.	Fr.	Lakeview
Bailey, Willis	Agri.	Soph.	Ashland
Bailiff, Florence	H. E.	Jr.	Corvallis
Baker, John Oscar	C. E.	Sr.	Portland
Baker, Ray Orien	I. A.	Fr.	Cove
Baker, Verne Jeanetta	H. E.	Spec.	Corvallis
Baldwin, Alva Kuntz	Agri.	Fr.	Bakersfield, Calif.
Baldwin, Frank Timmons	Agri.	Jr.	Bakersfield, Calif.
Baldwin, James	Agri.	Fr.	Blue Lake, Calif.
Baldwin, Lee Ernest	Phar.	Spec.	Winlock, Wash.
Ball, Harold	Agri.	Fr.	National City, Calif.
Ball, Waldo Whitney	Phar.	Spec.	Corvallis
Ball, Wilbur Herbert	M. E.	Soph.	Portland
Ballard, Frank Llewellyn	Agri.	Sr.	Meredith, N. H.
Ballhorn, Otto	Com.	Sr.	Woodland, Wash.
Ballin, Herbert August	Agri.	Jr.	Portland
Bannister, Edna	H. E.	Jr.	Weston
Bannister, Gladys	H. E.	Voc.	Weston
Barden, Una Marguerite	H. E.	Jr.	Missoula, Mont.
Barnes, Clay Asron	Agri.	Jr.	Goldendale, Wash.
Barnes, Helen Payne	Com.	Spec.	Portland
Barry, George Everett	M. A.	F. Yr.	Twickenham
Bartholomew, Hazel	Com.	S. Yr.	Corvallis
Bartholomew, Lela Mae	Com.	Fr.	Corvallis
Barton, Bessie	H. E.	Soph.	Puyallup, Wash.
Bartruff, Elmer Walter	Agri.	Soph.	Salem
Bartu, Frank	M. E.	Jr.	Crabtree
Barzee, Pearl Frye	Com.	Soph.	Corvallis
Bashore, Charles McKnight	Agri.	Fr.	Mifflintown, Pa.
Basler, Vernon	Agri.	Fr.	Grants Pass
Bass, Chester Allan	Agri.	Jr.	Portland
Bassett, Florence	Com.	Spec.	Newberg
Bassett, Olive	H. E.	Jr.	Newberg
Bates, Douglas	E. E.	Fr.	Portland
Bates, E. G.	For.	Sr.	Williamsport, Pa.
Baum, Francis	Agri.	Fr.	Portland
Baum, Olin Huntington	Agri.	Jr.	Portland
Bayliss, Edwin	Agri.	Soph.	Lafayette
Beals, Agnes	H. E.	Jr.	Corvallis
Beals, Elva Lovina	H. E.	Sr.	Corvallis
Beard, Edward	M. E.	Fr.	Astoria

Name.	Course.	Rank.	Home Address.
Beard, Fannie	Opt.	.....	Terre Haute, Ind.
Berchen, Martha	H. E.	Fr.	Hillsboro
Beck, James Obye	Agri.	Sr.	Boise
Beede, Roy Leslie	Agri.	Fr.	Drewsey
Beers, Ruby	H. E.	Soph.	Corvallis
Beery, Mrs. Ralph	H. E.	Voc.	Corvallis
Beery, Ralph	Agri.	Voc.	Corvallis
Behnke, Olive	H. E.	Jr.	Glenada
Bellinger, Gordon	For.	Fr.	St. Johns
Bellinger, Wilbur Moore	Agri.	Fr.	Corvallis
Belton, Howard Claire	Agri.	Sr.	Gardena, Calif.
Benham, Frank Norman.....	Agri.	Fr.	Seattle, Wash.
Bennett, Arthur	M. E.	Jr.	Dallas
Bennett, Cecil Howard	E. E.	Fr.	Rainier
Bennett, Cecil Rodney	For.	Voc.	Seneca
Bennett, Harry	Agri.	Voc.	Monroe
Bent, Charles	Phar.	S. Yr.	Corvallis
Bernstein, Salome	H. E.	Jr.	Portland
Berry, Carl Evan	Com.	Spec.	Hood River
Berven, Edmund Sigurd	Min.	Fr.	Portland
Bettis, James Oliver	Agri.	Fr.	Coburg
Betzel, Irwin Leonard.....	Phar.	Sr.	Portland
Bewley, Philip Mendenhall.....	Agri.	Voc.	Sheridan
Billie, Brewer Astor	M. E.	Sr.	Astoria
Bingham, Myrtle	H. E.	Fr.	Portland
Binswanger, Alvin Otto	Agri.	Jr.	Portland
Birch, Gracia Delle	H. E.	Fr.	Lincoln, Nebr.
Bissell, Rex Ide	M. A.	F. Yr.	Yreka, Calif.
Bissell, Ross Elder	Hi. E.	Fr.	Yreka, Calif.
Bissell, S. T.	Agri.	Voc.	Yreka, Calif.
Bissett, Lee Henry	Agri.	Fr.	Toledo
Bixby, Clarence Milton.....	Agri.	Sr.	Freewater
Bixby, Clarence Wilson	Agri.	Fr.	Prineville
Black, Burr	Agri.	Soph.	Bend
Black, Emerson Perry	Agri.	Soph.	Corvallis
Blackburn, Harold	Agri.	Fr.	Long Beach, Calif.
Blackden, Earl Benjamin	Agri.	Fr.	Ashland
Blackwell, Harlie Allan	M. E.	Soph.	Juneau, Alaska
Blackwell, Helen Sophia	H. E.	Soph.	Juneau, Alaska
Blagg, Henry Wilson	E. E.	Soph.	Hood River
Blake, Ruth	H. E.	Voc.	Tualatin
Blakely, Lloyd Herbert	I. A.	Soph.	Newport
Blomgren, Leonard Augustus.....	Min.	Fr.	Weston
Bogard, Troy	Agri.	Fr.	Woodburn
Boies, Etta	H. E.	Fr.	Corvallis
Boies, John	M. E.	Jr.	Corvallis
Boies, Justan	Agri.	Voc.	Corvallis
Boies, Thurza	H. E.	Sr.	Corvallis
Bolin, Francis Gerald	Agri.	Soph.	Portland

Name.	Course.	Rank.	Home Address.
Bolton, Virgil	Com.	S. Yr.	Antelope
Bones, John William	C. E.	Soph.	Carlton
Bonner, Joe Henry	M. E.	Fr.	Corvallis
Boon, Walter William	For.	Fr.	Portland
Boone, Earl	M. E.	Soph.	Toledo
Boone, John	M. E.	Soph.	Toledo
Booth, Clarence	Phar.	Jr.	Amity
Both, Julius	Agri.	Jr.	Rainier
Bower, Hazel Harriet	Opt.		Corvallis
Bowers, Ralph	Agri.	Sr.	Seattle, Wash.
Boyd, Martha Frances	H. E.	Voc.	Corvallis
Boyer, Will Warren	Min.	Jr.	Portland
Bozarth, Inez	H. E.	Sr.	Bay City
Bracons, Josephine	H. E.	Jr.	Portland
Brandes, Irene	H. E.	Jr.	Portland
Branland, Verner	Com.	F. Yr.	Colton
Branthoover, Lester Lee	Com.	Soph.	Payette, Ida.
Bravender, Ray Ross	Agri.	Voc.	Portland
Breithaupt, Alva	Agri.	Fr.	Portland
Brett, Sereno Elmer	For.	Jr.	Portland
Brewer, Grace	H. E.	Fr.	Portland
Brewer, Vallie	Com.	F. Yr.	Portland
Bristol, Ralph Ray	Opt.		Portland
Brixey, Maud	H. E.	Fr.	McMinnville
Brockman, Mildred	H. E.	Sr.	Weiser, Ida.
Brogden, John Lewis	Agri.	Spec.	Hillsboro
Bromberg, Harold	Phar.	Soph.	Portland
Brooke, John Rutter	Min.	Fr.	San Francisco, Calif.
Brownell, Dorothy Southwick	H. E.	Jr.	Portland
Brown, Bertha	Agri.	Spec.	Amity
Brown, Donald Edgar	Agri.	Jr.	Oregon City
Brown, Edward Guy	Com.	F. Yr.	New York, N. Y.
Brown, Ellis Elmer	Agri.	Sr.	New Era
Brown, Francis	Agri.	Soph.	Crystal
Brown, James Robert	Agri.	Spec.	Payette, Ida.
Brown, Lark Olaf	M. E.	Fr.	Portland
Brown, May	H. E.	Jr.	New Era
Brown, Waldo	Agri.	Voc.	New Era
Brown, Zoe Agnes	H. E.	Jr.	Seaside
Bruh, Rosa	H. E.	Fr.	Dayton
Brutscher, Carl	Min.	Fr.	Weston
Bryant, Claude Hale	Agri.	Soph.	Gaston
Buchanan, Bayard	C. E.	Jr.	Roseburg
Buckley, James	E. E.	Fr.	Portland
Budelier, Clarence Joseph	For.	Soph.	Rock Island, Ill.
Bullis, Deloss Everett	E. E.	Soph.	Payette, Ida.
Burke, Volma	H. E.	Fr.	Corvallis
Burley, Donald Miller	M. E.	Fr.	Redmond
Burman, T. W.	Agri.	Spec.	Pomona, Calif.

Name.	Course.	Rank.	Home Address.
Burnell, Ruth	H. E.	Jr.	Claremont, Calif.
Burns, Amelia Earle	H. E.	Sr.	Spokane, Wash.
Burns, John Richard	Min.	Soph.	Portland
Burns, Lillian	Com.	Sr.	Spokane, Wash.
Burns, Ralph Wilson	Agri.	Jr.	Tualatin
Burnside, Julian Bate	Agri.	Fr.	Seattle, Wash.
Burtner, William Reed	M. A.	F. Yr.	Dufur
Burton, Roy Wesley	Com.	Fr.	Anadarko, Okla.
Busenbark, John	Agri.	Voc.	Roseburg
Bush, Eugene Stanley	M. A.	S. Yr.	Houston, Texas
Butt, Ralph Augustus	Com.	Fr.	Newberg
Byers, Oscar	For.	Soph.	Portland
Calbom, Harry	Agri.	Voc.	Mt. Vernon, Wash.
Caldwell, Clytie	Agri.	Sr.	Wenatchee, Wash.
Caldwell, Strain	Agri.	Fr.	San Dimas, Calif.
Camp, Beryl	Phar.	S. Yr.	Portland
Camp, Roy	M. E.	Spec.	Portland
Campbell, Edna	H. E.	Fr.	Oakbar, Calif.
Campbell, Fannie Marie	Opt.	.....	Roseburg
Campbell, Kenneth George	Agri.	Voc.	Honolulu, H. T.
Cardinell, Horace Albert	Agri.	Sr.	Portland
Carley, Marguerite	H. E.	Fr.	Montpeiler, N. Dak.
Carlin, Marjorie Dale	Com.	S. Yr.	Dawson, Y. T.
Carlson, Evelyn	Com.	Sr.	Portland
Carlson, Ruth	Com.	Jr.	Corvallis
Carlson, Vida	H. E.	Jr.	Corvallis
Carnie, Norval Craigie	Agri.	Soph.	Chicago, Ill.
Carpenter, Clarence	E. E.	Fr.	Joseph
Carpenter, Eugene Johnson	Agri.	Jr.	Ashland
Carpenter, George	M. E.	Fr.	Washougal, Wash.
Carpenter, Walter	Agri.	Fr.	Ashland
Carroll, Maurine	H. E.	Jr.	Harrisburg
Carson, Walter Guy	C. E.	Sr.	Hermiston
Carter, Bernice	H. E.	Fr.	Haines
Carter, Hallie	H. E.	Fr.	Eugene
Carter, Wilder Jameson	Agri.	Spec.	Aberdeen, Wash.
Case, Mary	Com.	Fr.	Kalama, Wash.
Case, Richard Burton	Agri.	Sr.	Portland
Case, Russell Jeffrey	Agri.	Jr.	Portland
Caspar, Elsie	H. E.	Jr.	Union
Casteel, Drusilla	H. E.	Fr.	Eugene
Catherwood, Edith	H. E.	Voc.	Portland
Cavender, Alberta	H. E.	Jr.	Portland
Cavin, Gordon Thomas	Agri.	Voc.	Ladysmith, B. C.
Center, Newton	M. E.	Fr.	Toledo
Chamberlin, Willard	For.	Sr.	Albuquerque, N. M.
Chambers, George Frederick	Min.	Jr.	Newberg
Chambers, Joseph	Agri.	Sr.	Newberg

Name.	Course.	Rank.	Home Address.
Chandler, Mrs. Asa	H. E.	Spec.	Corvallis
Chandler, George L.	Agri.	Fr.	Rogue River
Chapler, Raymond Herald	For.	Sr.	Salem
Chapman, John Cecil	Min.	Fr.	Sheridan
Chase, Ernest	For.	Sr.	Corvallis
Chase, Flora Mildred	Opt.	.....	Corvallis
Chase, Lucile	H. E.	Sr.	Salem
Chellis, Lawrence	I. A.	Fr.	Astoria
Chenault, Ralph Garfield	Agri.	Sr.	La Grande
Cheney, Roy	Agri.	Spec.	Corvallis
Chindgren, Anton Benjamin.....	Agri.	Voc.	Mulino
Chinn, James Edgar	Phar.	S. Yr.	Weiser, Ida.
Chioco, Juan Ortiz	C. E.	Soph.....	Sto. Domingo, P. I.
Chisum, Ara	H. E.	Voc.	Medford
Christensen, Carl	Agri.	Voc.....	Holstebro, Denmark
Churchill, Leigh	Agri.	Fr.	Santa Cruz, Calif.
Churchman, Tressa	Com.	Fr.	Corvallis
Clark, Arthur Clarence	C. E.	Sr.	St. Johns
Clark, Carrie	H. E.	Jr.	Waitsburg, Wash.
Clark, Cedric	Com.	Sr.	Canyon City
Clark, Frank Lewis	Agri.	Soph.	Portland
Clark, Hazel	H. E.	Sr.	Berkeley, Calif.
Clark, Mary	H. E.	Voc.	Pueblo, Colo.
Clark, Ola	H. E.	Soph.	Salem
Clark, Willie Franklin	Com.	F. Yr.	Ladysmith, B. C.
Clark, Wm. Victor	Agri.	Jr.	Laytonville, Calif.
Clancy, James	L. E.	Fr.	Woodland, Wash.
Clausen, Arnold Alvin.....	C. E.	Sr.	The Dalles
Clock, Audrey	Com.	Soph.	The Dalles
Coahran, Wm. Hadaway	Agri.	Sr.	Corvallis
Coe, Earl Alphonso	Agri.	Fr.	Portland
Coe, Wayne Walter	Agri.	Sr.	Portland
Coglon, Hazel Frye	H. E.	Spec.	Boise, Idaho
Cohen, Benjamin Bernard	Agri.	Jr.	Portland
Cohen, Julius	Com.	Soph.	The Dalles
Cole, Albert Benjamin.....	Agri.	Sr.	Pasadena, Calif.
Cole, Grace Elizabeth.....	H. E.	Sr.	Portland
Cole, Harry Julius	Com.	Fr.	Emporia, Kan.
Cole, Wm. Sidney	Agri.	Fr.	Portland
Coleman, Lloyd Wilbur	Agri.	Fr.	Berkeley, Calif.
Coleman, Ralph Orval	Agri.	Fr.	Canby
Collamore, Lorna Anne	H. E.	Soph.	Portland
Colter, Ada	H. E.	Voc.	Glenada
Colter, Jen Isa	H. E.	Voc.	Glenada
Colvin, Mabel	H. E.	Fr.	Marshfield
Colvin, Thomas	L. E.	Fr.	Marshfield
Cone, Earl	Agri.	Voc.	Donald
Conklin, Evelyn	H. E.	Sr.	Grants Pass
Conkling, Ronald	Agri.	Spec.	Tehama, Nebr.

Name.	Course.	Rank.	Home Address.
Conner, Edna	H. E.	Soph.	Sheridan
Conner, Nathan Earl	M. A.	F. Yr.	Sheridan
Conner, Raymond	C. E.	Sr.	Corvallis
Conner, Rosemary	Com.	F. Yr.	Corvallis
Conyers, Kit. Carson	L. E.	Fr.	Clatskanie
Cook, Homer	Agri.	Spec.	San Diego, Calif.
Cooley, Florence	Phar.	Jr.	Junction City
Cooley, Inez	Phar.	Jr.	Junction City
Coon, Abbie	H. E.	Sr.	Corvallis
Cooper, Charles	Agri.	Voc.	Cloverdale
Cooper, Howard Wesley	E. E.	Fr.	Milwaukee
Cooper, Lovilla	H. E.	Spec.	Independence
Cooper, Rodney	C. E.	Soph.	Dufur
Corbin, Kathryn	Com.	Sr.	Portland
Corey, Glen	E. E.	Fr.	Hood River
Corl, Frances Helen	H. E.	Jr.	Corvallis
Corl, Leland David	M. E.	Jr.	Corvallis
Cornell, Edna Frances	H. E.	Jr.	Grants Pass
Cornwall, Alice	H. E.	Soph.	Portland
Corum, Curtis Lee	Min.	Fr.	The Dalles
Couch, Leo King	Agri.	Fr.	Wallowa
Couch, Roy	Agri.	Fr.	La Grande
Counts, Wilda	H. E.	Fr.	Grants Pass
Courtney, Lois	H. E.	Jr.	Portland
Cox, Epsie	Opt.	.....	Portland
Craig, Asa	Agri.	Sr.	Enterprise
Craine, Erma	H. E.	Sr.	Bandon
Craine, Pearl	Com.	Soph.	Bandon
Crain, Wm. Wallace	Agri.	Jr.	Biggs
Cramer, Floyd Samuel	M. A.	T. Yr.	Corvallis
Cramer, Theodore Putman	Com.	Fr.	Grants Pass
Crane, Fred Hovey, Jr.	Agri.	Fr.	Fairview
Crawford, Eda	H. E.	Voc.	The Dalles
Crawford, Hugh Herman	Agri.	Fr.	San Dimas, Calif.
Crawford, J. A.	L. E.	Soph.	Burlington, Ia.
Creighton, Leland	M. E.	Jr.	Portland
Crockatt, Edith	H. E.	Sr.	Spokane, Wash.
Cromley, Gladys	Opt.	.....	Culver, Ind.
Cronemiller, Fred Parks	For.	Soph.	Lakeview
Crooks, Viola	H. E.	Voc.	Albany
Crosby, Hartzell	Agri.	Sr.	Sherwood
Croswhite, John Raymond	Agri.	Fr.	Long Beach, Calif.
Crout, Mildred	H. E.	Fr.	Portland
Crouter, Leo DeHart	Com.	Sr.	Union
Crouter, Paul	Agri.	Jr.	Union
Crum, McKinley	Agri.	Fr.	Olex
Crumley, Elmer	Agri.	Sr.	National City, Calif.
Culver, Ben	For.	Sr.	The Dalles

Name.	Course.	Rank.	Home Address.
Cunning, Ethel	Opt.	.....	Baker
Cunning, Jennie	H. E.	Sr.	Baker
Cunningham, Bessie	Com.	F. Yr.	Woodburn
Currey, Hiram Meyrick	Agri.	Sr.	Ontario
Currey, Joseph Edmond	Agri.	Jr.	Olympia, Wash.
Currey, Pinney Alfred	Phar.	Jr.	Baker
Curriu, Mary Edith	Com.	Soph.	Heppner
Curry, Fred	Phar.	Fr.	Albany
Curtis, Roland Edward	Agri.	Sr.	Claremont, Calif.
Cushman, Vernon Vivian	M. E.	Fr.	Acme
Daggett, Carter N.	Agri.	Voc.	Port Ludlow, Wash.
Daggett, Francis D.	Agri.	Voc.	Port Ludlow, Wash.
Dallas, Earle Wesley	Agri.	Fr.	Corvallis
Dallas, Willis Robert	Agri.	Sr.	Corvallis
Damon, Nelson	Agri.	Voc.	Ferndale, Calif.
Damon, Robert Elbridge	Agri.	Fr.	Ferndale, Calif.
Damon, Ruth	H. E.	Soph.	Corvallis
Danneel, Henry William.....	I. A.	Soph.	Hillsboro
Darling, Lois	H. E.	Voc.	Thorn, N. Dak.
Davidson, Harold	Agri.	Fr.	Meridian, Ida.
Davidson, Leffie	H. E.	Jr.	Portland
Davidson, Robert Hershel	Agri.	Jr.	Meridian, Ida.
Davis, Charles Elwyn	Agri.	Jr.	Union
Davis, Mabelle	H. E.	Soph.	Corvallis
Davis, Percy Evert	Agri.	Fr.	Corvallis
Davisson, Margaret	H. E.	Sr.	Central Point
Day, Ralph Coulter	C. E.	Sr.	Portland
Dean, Minnie	H. E.	Voc.	Corvallis
Dean, Stella	Phar.	Sr.	Castle Rock, Wash.
DeLosh, Beaumont	Com.	Fr.	Aberdeen, Wash.
Dement, Harry George	Com.	Fr.	Myrtle Point
Denniston, Laneta	H. E.	Fr.	McMinnville
Deutsch, Henry	For.	Sr.	Portland
Dewey, Garrington George.....	Agri.	Sr.	Corvallis
DeWitt, Charles	Agri.	Fr.	Dawson, Y. T.
Deyoe, Harold Leroy	E. E.	Jr.	Portland
Dietsch, Frank	Agri.	Sr.	Days Creek
Dillon, Don Carlos	Agri.	Fr.	Ellensburg, Wash.
Doerner, Armin Meredith.....	Agri.	Jr.	Denver, Colo.
Dolde, William Earl	I. A.	Sr.	Guthrie, Okla.
Doolittle, Harold	Agri.	Jr.	Pomona, Calif.
Doolittle, Maide	H. E.	Jr.	Corvallis
Doolittle, Lydia	H. E.	Sr.	Corvallis
Dorris, Zed	Agri.	Fr.	Los Angeles, Calif.
Doty, Paul	Agri.	Soph.	Pasadena, Calif.
Dougherty, Helen	H. E.	Fr.	Baker
Downs, A. Isabella	Phar.	Jr.	Canby
Doxsee, Earl De Witte.....	Agri.	Sr.	Brownsville

Name.	Course.	Rank.	Home Address.
Dunn, Edwin	Agri.	Soph.	Ashland
Dunne, Helen Gertrude.....	H. E.	Spec.	Portland
Dunn, Wallace Wilkinson.....	M. A.	S. Yr.	Corvallis
Dyar, Mrs. Amelia	H. E.	Voc.	Corvallis
Dye, Everett Willoughby.....	M. E.	Fr.	Oregon City
Dyson, Lizzie	H. E.	Fr.	Dahlia, Wash.
Eames, De Lin	M. A.	F. Yr.	Cordova, Alaska
Eastman, Eugene Harold	Agri.	Fr.	Portland
Eaton, Joseph Edmund	Agri.	Spec.	Portland
Eaton, Karl	Agri.	Jr.	Lents
Eaton, Walter	Phar.	Fr.	The Dalles
Ebinger, Harvey Paul	Phar.	F. Yr.	Tillamook
Eckley, Victor	Agri.	Fr.	La Grande
Eckley, Winfield	E. E.	Jr.	La Grande
Edwards, James Homer	Agri.	Soph.	Monroe
Edwards, Jess	Phar.	Sr.	Sumpter
Ehrman, Harry	E. E.	Sr.	Junction City
Ellested, Melvin Herman	M. A.	S. Yr.	Central Point
Ellestad, Theodore Alfred.....	Agri.	Sr.	Corvallis
Embry, Clay	Agri.	Soph.	Charleston, Wash.
Emmons, Louise Wilbur	Opt.		Roseburg
Englund, Eric	Agri.	Fr.	Portland
Engbretson, Albert Edward.....	Agri.	Jr.	Astoria
Erickson, Anton	Agri.	Spec.	Portland
Etsell, George	I. E.	Fr.	Seattle, Wash.
Evans, Russell David	Com.	Voc.	Medford
Fatt, Loo Nai	Agri.	Fr.	Canton, China
Faurie, Marguerite	H. E.	Voc.	Molalla
Fellows, Hurley	Agri.	Fr.	Oregon City
Felton, Dannie Sherman	Com.	Soph.	Corvallis
Fendall, De Vere	Agri.	Jr.	Newberg
Fendall, Virgil	Agri.	Jr.	Newberg
Fenton, Esther	H. E.	Fr.	Meridian, Idaho
Ferguson, Arthur	Agri.	Soph.	Helix
Ferguson, Arthur	Agri.	Spec.	Seattle, Wash.
Ferguson, Forest Summers.....	For.	Voc.	Sisson, Calif.
Ferguson, Homer	M. E.	Fr.	Portland
Ferguson, Oscar Earl	Agri.	Jr.	Helix
Fertig, Charles	Opt.		Hood River
Finch, Arthur William	Agri.	Jr.	Gardena, Calif.
Finney, John Lawrence	Agri.	Fr.	Astoria
Firestone, Verne	Agri.	Fr.	Vancouver, Wash.
Fisk, Carlos	Agri.	Jr.	Parma, Idaho
Fitts, Grace	H. E.	Jr.	Corvallis
Flanagan, Chas. Bartlett.....	Agri.	Sr.	Marshfield
Flegel, Charles	Agri.	Sr.	Portland
Fleming, Homer	Agri.	Fr.	Joseph
Fleming, Marjorie	H. E.	Fr.	Medford

Name.	Course.	Rank.	Home Address.
Fletcher, Allan Taylor	Com.	Sr.	Buell
Flint, John	Agri.	Sr.	San Diego, Calif.
Flippin, Thomas Joseph	Agri.	Jr.	Rainier
Floss, Carl Fritz	Min.	Jr.	Milwaukee
Floydstead, Harry	Com.	Fr.	Tacoma, Wash.
Forbis, John Franklin, Jr.	Agri.	Sr.	Dilley
Forest, Bernice	H. E.	Fr.	Portland
Forsgren, Ellis Jones	M. A.	F. Yr.	Gresham
Forster, Fred Henry	Hi. E.	Jr.	Tangent
Fortner, Phillip	Agri.	Fr.	Fowler, Calif.
Foster, Albert	Phar.	Jr.	Dayton
Foster, Harriett	H. E.	Jr.	Corvallis
Fowler, Fred	Agri.	Jr.	Forest Grove
Fowler, Robert Grey	Agri.	Sr.	Portland
Fox, Kenneth	Min.	Jr.	Portland
Fraleley, Earl John	Com.	Sr.	Ashland
Frame, Dana Selby	Agri.	Fr.	Talent
Francis, George Leslie	Agri.	Sr.	Portland
Francis, Thomas Ernest	Agri.	Jr.	Burkville, Va.
Frank, Arthur	Agri.	Sr.	South Bend, Ind.
Fraser, John Henry	C. E.	Jr.	Parkplace
Frazier, Genevieve	H. E.	Fr.	Salem
Freeman, George Earl	Com.	Fr.	Waitsburg, Wash.
French, Irvine	Min.	Fr.	Enterprise
French, Phoebe,	H. E.	Fr.	Corvallis
Freyler, Edna	H. E.	Fr.	Corvallis
Frick, Robert	For.	Jr.	San Francisco, Calif.
Friday, Roberta	H. E.	Jr.	Hood River
Fridley, Callie	H. E.	Soph.	Klondike
Fridley, Dora	H. R.	Jr.	Klondike
Fridley, Nettie	H. E.	Soph.	Klondike
Friedman, David	Agri.	Soph.	St. Charles, Ill.
Frost, Carl Magnus	E. E.	Jr.	Portland
Fryer, Carl Augustus	Phar.	Sr.	Shaw
Funk, Arnold John	Com.	Jr.	Corvallis
Funk, Arthur Louis	Agri.	Fr.	Oregon City
Gaines, Clarence	Agri.	Spec.	Berkeley, Calif.
Gall, Erskine Meade	Agri.	Sr.	Santa Ana, Calif.
Gammons, Gordon	Hi. E.	Fr.	Portland
Gammon, Earle	Agri.	Fr.	Hood, Calif.
Garbutt, Earl Edward	M. E.	Fr.	Sheridan, Wyo.
Gardiner, Frances	H. E.	Fr.	Baker
Gardiner, Wm. Benson	Agri.	Sr.	Colorado Springs, Colo.
Garvin, Victor	Agri.	Jr.	Denver, Colo.
Gatchell, Barnard	I. A.	Jr.	Corvallis
Gates, Daniel	Agri.	Voc.	Corvallis
Gates, Pearl	H. E.	Jr.	Corvallis
Gaylord, Clarence Clyde	Phar.	Sr.	Halfway

Name.	Course.	Rank.	Home Address.
Geary, Edward	Agri.	Sr.	Portland
Gekeler, James Lincoln	Agri.	Voc.	Elgin
Gentner, Louis	Agri.	Sr.	Portland
Gentry, Eva Lenore	Com.	Fr.	Portland
Gerke, Norman	Agri.	Voc.	The Dalles
Gerke, Walter Henry	Agri.	Jr.	Portland
Gerttula, Edward Mathews	M. A.	F. Yr.	Blind Slough
Giguette, George	Agri.	Spec.	Pasadena, Calif.
Gilbert, Henry	Agri.	Sr.	Salem
Gilbert, Mahlon Bruce	Agri.	Jr.	Woodburn
Gildner, Walter Fred	E. E.	Sr.	Astoria
Gillette, Mina	H. E.	Soph.	Claremont, Calif.
Gillmore, John Emery	Phar.	S. Yr.	St. Johns
Glines, Ione	H. E.	Fr.	Waldport
Glines, Haleie Williford	Agri.	Jr.	Waldport
Glines, Hallie	H. E.	Fr.	Waldport
Gloman, Joseph Storey	Agri.	Fr.	Bellingham, Wash.
Goble, Ray Elbert	Agri.	Sr.	Ferndale, Calif.
Godel, Howard	Agri.	Fr.	Portland
Godfrey, Lena	H. E.	Spec.	Portland
Gooch, Fred	Phar.	Fr.	Corvallis
Gordon, Will Hughes	Com.	Fr.	Portland
Goutt, Ada May	H. E.	Voc.	Tacoma, Wash.
Graf, Herman	M. E.	Jr.	Portland
Gragg, George Merle	Agri.	Jr.	Monroe
Graham, Frederick	Agri.	Voc.	Kobel, Calif.
Graham, Guy Vernon	Min.	Fr.	Portland
Graham, Mildred	H. E.	Fr.	Portland
Gram, Michael	Agri.	Spec.	Copenhagen, Denmark
Grasle, Wesley Reed	E. E.	Sr.	Milwaukee
Graves, Leaman	Agri.	Fr.	Kansas City, Kan.
Gray, Viola	Com.	Spec.	Milwaukee
Green, Carl Clifford	Agri.	Soph.	Parkdale
Green, Dorr Dudley	Agri.	Soph.	Parkdale
Green, Ferris Milton	Agri.	Voc.	Phoenix, Ariz.
Green, John Wesley	C. E.	Jr.	Suver
Greenburg, Herman	For.	Voc.	Beaverton
Greene, Francis Killaly	Agri.	Jr.	Aberdeen, Wash.
Geer, Medric	Agri.	Fr.	Dundee
Gregg, Rodney	M. E.	Fr.	Gazelle, Calif.
Grenfel, Waldo	Min.	Fr.	Portland
Gribskov, Maren	H. E.	Fr.	Junction City
Griffin, Carrie Sprague	H. E.	Voc.	Oakwood, Mo.
Grimes, Ella Belle	H. E.	Soph.	Portland
Groce, Eustace Cecil	For.	Fr.	Portland
Grow, Homer Wallace	Agri.	Fr.	Fairfax, Vt.
Grubbe, Eugene Erle	Phar.	Spec.	Elkton
Gubser, Harlan	Agri.	Voc.	Fort Rock
Guha, Dakshina Parjan	M. E.	Jr.	Dasca, India

Name.	Course.	Rank.	Home Address.
Gurlay, Wayne	E. E.	Fr.	Canby
Guthrie, Leroy Roland	M. E.	Fr.	Amity
Hackett, Harold Nelson	E. E.	Jr.	Elgin
Hadrys, Frank	E. E.	Sr.	Corvallis
Hage, Annie	H. E.	Voc.	Silverton
Hagey, Grover Adel	Phar.	Jr.	Sherwood
Halferty, George	Agri.	Fr.	Aberdeen, Wash.
Hall, Mildred	H. E.	Sr.	Corvallis
Hall, Phila	H. E.	Fr.	Fairfax, Vt.
Hall, Thomas Newton	Hi. E.	Fr.	Emporia, Kan.
Hamilton, Edith	H. E.	Voc.	Corvallis
Hamilton, Gladys	H. E.	Voc.	Corvallis
Hamilton, Harry	M. E.	Jr.	Portland
Hamilton, John Monroe	Agri.	Jr.	National City, Calif.
Hamilton, William	Phar.	S. Yr.	La Grande
Hammerly, Hugh Fisher	Phar.	Jr.	Albany
Hammon, Josephine	H. E.	Fr.	Silverton
Hammond, Louise	H. E.	Jr.	Portland
Hampton, Otis Harold	Agri.	Fr.	Pendleton
Hancock, Margaret	Com.	Fr.	Forest Grove
Hansen, Harold VonStein.....	Com.	Soph.	Corvallis
Hansen, Ingeborg	H. E.	Fr.	Portland
Hansen, Beneta Kareen	H. E.	Sr.	Corvallis
Hansen, Manette	H. E.	Jr.	Corvallis
Hansen, Margaret	Com.	Sr.	Corvallis
Hanson, John Milton	M. E.	Fr.	North Bend
Hanthorn, Faith	H. E.	Soph.	Portland
Happold, Louie	E. E.	Fr.	Klondike
Hardman, George	Agri.	Sr.	Ontario
Hardman, Rozelle	Opt.	.....	Corvallis
Hardman, Sylvia Anna	H. E.	Sr.	Portland
Harp, Roy Edward	Agri.	Voc.	Douglas, Nebr.
Harriman, Arthur Absalom.....	Com.	Sr.	The Dalles
Harriman, Edna Cornelius.....	Com.	Sr.	The Dalles
Harriman, Fred Edward	Com.	Soph.	The Dalles
Harriman, Nellie Hanford.....	Com.	Sr.	The Dalles
Harris, Milton	C. E.	Soph.	Portland
Harrison, Dorothy	H. E.	Fr.	Corvallis
Harrison, Edwin Leslie	Phar.	Fr.	Tillamook
Harrison, M. Allen	Agri.	Sr.	Brownsville
Harritt, Jessie	H. E.	Sr.	Salem
Hart, Martha	H. E.	Jr.	Portland
Hartley, Edwin	For.	Soph.	Corvallis
Hartzig, Delphia	H. E.	Jr.	Lakeview
Harvey, Paul Atwood	Agri.	Jr.	Cashmere, Wash.
Harvey, Wm. Moir	Agri.	Voc.	Corvallis
Haseltine, Helen Elizabeth.....	H. E.	Fr.	Portland
Hathaway, Gail	For.	Fr.	Harrisburg

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Name.	Course.	Rank.	Home Address.
Hathaway, Marcus Francis.....	Agri.	Jr.	Corvallis
Hattan, Elton	Min.	Fr.	Oregon City
Hauser, Soloman William	Agri.	Voc.	Tygh Valley
Haverstick, Russell	Agri.	Soph.	Cashmere, Wash.
Haw, Horace Leo	Agri.	Jr.	Pendleton
Hawkins, Joe Cephus	Agri.	Spec.	Sayre, Okla.
Hawley, Mary	Com.	Sr.	Corvallis
Hawley, Willa	H. E.	Sr.	Corvallis
Hay, Wiliam Chambers	Phar.	Spec.	Lihue, Hawaii
Hays, Frank Arthur	Agri.	Soph.	Pasadena, Calif.
Hayes, Jack	Com.	Fr.	Portland
Hayes, Lucille	H. E.	Jr.	Portland
Hayes, Oliver Bliss	Agri.	Sr.	Pasadena, Calif.
Hays, Margaret Lydia	Com.	F. Yr.	Junction City
Hazeltine, Caryl	L. E.	Fr.	Salem
Head, Cecille	H. E.	Fr.	Waldport
Heath, Charles	Agri.	Spec.	Sioux Falls, S. Dak.
Heath, Howard Wills	Min.	Fr.	Tacoma, Wash.
Heath, Laura	H. E.	Sr.	Corvallis
Heltzel, John	Com.	F. Yr.	Banks
Heminger, Norris	For.	Spec.	Corvallis
Heminger, Willard	For.	Soph.	Corvallis
Henck, Edward Warren	M. E.	Fr.	Santa Barbara, Calif.
Henderson, Charles Albert.....	Agri.	Jr.	Gardner
Henderson, John Herschel.....	Min.	Fr.	Milton
Henderson, Lester	M. A.	F. Yr.	Eureka, Wash.
Henderson, William Wright.....	Agri.	Soph.	Kahuku, Hawaii
Hendrick, Bertha	H. E.	Sr.	Silverwood, Mich.
Hendrickson, Victor	For.	Voc.	Newberg
Henry, Arthur	Com.	Fr.	Corvallis
Hercher, Lawrence Alwin.....	Agri.	Voc.	Dillard
Hewes, Cora	H. E.	Jr.	Albany
Hewett, Henry, Jr.....	Agri.	Jr.	Portland
Hewitt, Marion Samuel	M. E.	Sr.	Stockton, Calif.
Hewett, Roland Myrtle	M. E.	Fr.	Canby
Heywood, Herbert Joseph.....	M. E.	Soph.	Portland
Hickey, LeRoy Wilford	Agri.	Voc.	Portland
Hicks, Mildred	H. E.	Fr.	Klamath Falls
Hicks, Prentiss	Com.	Fr.	Canyon City
Hiestand, Clynton	Phar.	Spec.	Corvallis
Hill, Charles Edwin	Agri.	Sr.	W. Springfield, Mass.
Hill, Howard	Agri.	Spec.	Medford
Hill, Mrs. Howard	H. E.	Voc.	Medford
Hill, Ruth	H. E.	Sr.	Eugene
Hilton, Harold Henry	Agri.	Spec.	Portland
Hittson, Carmen	Phar.	Sr.	Medford
Hobgood, Guy	Agri.	Sr.	Madisonville, Ky.
Hodgson, Marian	H. E.	Fr.	Ashland
Hoerlein, Paul Frank	Agri.	Spec.	Hood River

Name.	Course.	Rank.	Home Address.
Hoerner, Godfrey Richard.....	Agri.	Jr.	Seattle, Wash.
Hofer, Paul Ballon	Agri.	Spec.	Salem
Hoflich, Neva Leona	H. E.	Jr.	Albany
Hogan, Walter	For.	Fr.	Burbank, Calif.
Holdren, Homer	Agri.	Soph.	Gladstone
Holland, Gladys	Com.	Soph.	Burns
Holland, Timothy	M. A.	Spec.	Northfield Falls, Vt.
Hollenberg, Leo	Agri.	Soph.	Corvallis
Hollingsworth, Esther	H. E.	Fr.	Newberg
Hollingsworth, Gertrude	H. E.	Jr.	Newberg
Hollowell, Garland	Com.	F. Yr.	Milwaukee
Holmes, Elsie	H. E.	Voc.	Enterprise
Holmes, Frederick Aram.....	L. E.	Soph.	Enterprise
Hook, Florence	H. E.	Fr.	Aberdeen, Wash.
Hooper, John Amos	E. E.	Soph.	Corvallis
Hooper, Stella	H. E.	Spec.	Midland
Hoover, Dorothy	H. E.	Fr.	Fossil
Hoover, Fenton Whitman.....	C. E.	Soph.	Portland
Hopkins, George Evans	C. E.	Sr.	Corvallis
Hopkins, Lewis Raymond	L. E.	Fr.	Corvallis
Horning, Helen	H. E.	Jr.	Corvallis
Hoskins, Verne	M. A.	F. Yr.	Donald
Hoskins, Walter Scott	M. A.	F. Yr.	Donald
Houck, Roy Lester	E. E.	Soph.	Amity
Houliston, George McLean	Agri.	Jr.	East Aurora, N. Y.
Howe, George	For.	Soph.	Portland
Howe, Marian	H. E.	Fr.	Hood River
Howell, Mrs. Bert	Com.	Spec.	Corvallis
Howell, Grace	H. E.	Fr.	Salem
Howell, Herbert Badolett.....	Agri.	Jr.	Portland
Howells, Katherine	H. E.	Fr.	Medford
Howitt, Elizabeth	H. E.	Jr.	Gresham
Hubbard, Chauncey Mulka	Agri.	Jr.	Corvallis
Hubbard, Harry	C. E.	Sr.	Rickreall
Hudson, Jacob Ray	M. A.	F. Yr.	Milton
Huffman, Nellie Bly	H. E.	Voc.	Andrews
Hug, Bernal Dean	Agri.	Fr.	Elgin
Hulbert, Fred	Com.	Fr.	Aberdeen, Wash.
Hulbert, George Thos.	Com.	S. Yr.	Aberdeen, Wash.
Hult, Gustaf	For.	Jr.	Corvallis
Humason, Matilda Frances	Com.	Sr.	Portland
Humfeld, Harry	Agri.	Voc.	Portland
Humphrey, Esther	H. E.	Soph.	Eugene
Hung, Tung Ming	Agri.	Fr.	Amoy, China
Hunt, Echo Clair	Phar.	Fr.	Salem
Huntley, Floyd Jerry	Com.	Fr.	Gold Beach
Hurley, Alton	Agri.	Jr.	Seattle, Wash.
Husbands, Ether	H. E.	Fr.	Hood River
Huston, Helen	H. E.	Fr.	Corvallis

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Name.	Course.	Rank.	Home Address.
Hyams, Leo Klein	M. E.	Jr.	Portland
Hyde, Walter Robert	Phar.	Soph.	Corvallis
Imrie, Lillian	H. E.	Soph.	Melrose
Imrie, Wilford	Agri.	Voc.	Melrose
Ingles, Hollis Glen	C. E.	Soph.	Salem
Ingham, M. DeEtta	Com.	Jr.	Portland
Ingram, Alfred Chartney	Com.	Spec.	Cove
Inman, Wilbur Joseph	Com.	F. Yr.	Ft. Collins, Colo.
Irving, Iona	H. E.	Sr.	Corvallis
Irwin, Albert Hugh	Agri.	Fr.	Vanora
Iverson, Theodore	Agri.	Voc.	Elme, Ia.
Jackson, Della	H. E.	Jr.	Lorane
Jackson, Eva	H. E.	Jr.	Portland
Jackson, Laura	H. E.	Fr.	Lorane
Jacobson, Ernest	Agri.	Soph.	Macdoel, Calif.
Jacoby, Carl Charles	L. E.	Soph.	Toledo, Wash.
Jacoby, Fred	Agri.	Fr.	Corvallis
Jaeger, Harry	Agri.	Fr.	Portland
James, Oscar William	I. A.	Sr.	Robnet
Jamison, Dwight Lyman	Agri.	Sr.	Corvallis
Janes, Marjorie	H. E.	Soph.	Portland
Jeffers, Fred Marion	Agri.	Soph.	Portland
Jenkins, Merle Truman	Agri.	Jr.	Portland
Jernstedt, Maurice	Agri.	Soph.	Carlton
Jessup, George Le Roy	M. A.	F. Yr.	West Stayton
Jessup, John Mercator	Agri.	Spec.	Cooks, Wash.
Jetley, Arthur Christ Lee	Hi. E.	Fr.	Narrows
Jewel, Herbert	Com.	S. Yr.	Portland
John D. Morris	Com.	Jr.	Corvallis
Johns, Miles Shirk	Agri.	Tr.	Bellingham, Wash.
Johnson, Carl Stewart	Agri.	Soph.	Portland
Johnson, Chris Edward	Phar.	Fr.	North Powder
Johnson, Darrel Delos	Com.	Fr.	Corvallis
Johnson, Franklyn Whitcomb	E. E.	Fr.	Portland
Johnson, Jennie	H. E.	Voc.	Portland
Johnson, Lewis Ross	Agri.	Sr.	Bloomington, Ill.
Johnson, Lillian	H. E.	Soph.	Corvallis
Johnson, Louis Merle	Com.	Soph.	Portland
Johnson, Willard	For.	Fr.	Corvallis
Johnston, Perry Nolan	Agri.	Jr.	Moro
Johnston, Theodore	Agri.	Sr.	Moro
Johnston, Wm. Waters	Agri.	Soph.	Corvallis
Jonassen, Olaf	For.	Soph.	Rock Island, Ill.
Jones, Edward Delta	M. E.	Jr.	Jefferson
Jones, Jackson Floyd	Agri.	Fr.	Gresham
Jones, James Henrick	I. E.	Fr.	Vichy Springs, Calif.
Jones, Leon Kibby	Agri.	Jr.	Seattle, Wash.
Jones, Ronald Ewart	E. E.	Fr.	Brooks

Name.	Course.	Rank.	Home Address.
Jonsrud, Albert	Agri.	Fr.	Boring
Jordan, Arthur	C. E.	Jr.	Pendleton
Kadderly, Wallace	Agri.	Soph.	Portland
Kain, Corland Edward	E. E.	Fr.	Portland
Kalbus, Minnie	H. E.	Jr.	Chehalis
Kan, Frank Fan	Agri.	Jr.	Nom Tong, China
Kathan, George Lewis	Agri.	Jr.	Syracuse, N. Y.
Keatley, Eva	H. E.	Jr.	Castle Rock, Wash.
Keen, William Henry	M. A.	F. Yr.	Portland
Keil, Carl	E. E.	Fr.	Cosmopolis, Wash.
Keller, Fred	Agri.	Spec.	Portland
Kennedy, Rowe Davis	M. E.	Sr.	Corvallis
Kent, Arthur	Min.	Fr.	Mt. Gilead, Ohio
Kent, Nola Viri	H. E.	Spec.	Drain
Kenton, Ralph Mills	M. E.	Jr.	Albany
Kepner, Margaret	H. E.	Voc.	Lordsbury, Calif.
Kern, Winnifred	H. E.	Fr.	Jennings Lodge
Kerr, Lynette	H. E.	Voc.	Corvallis
Ketchum, Beth	H. E.	Soph.	Independence
Ketchum, Jean	H. E.	Jr.	Independence
Kiddle, Lyle Blair	Com.	Fr.	Island City
Kinderman, W. C.	E. E.	Sr.	Hoskins
King, Charles Allen	E. E.	Sr.	Ashland
King, Audra Rinehart	H. E.	Voc.	Corvallis
King, C. Winnie	H. E.	Sr.	Corvallis
King, Luther Andrew	I. A.	Sr.	Cottage Grove
King, Philip	Agri.	Soph.	Portland
King, Rudolph	Agri.	Spec.	Portland
Kingsley, Earl James	Com.	Jr.	Culver
Kinnison, Grace	H. E.	Soph.	San Francisco, Calif.
Kirk, Carl	Agri.	Voc.	Junction City
Kirtley, Naomi Edna	H. E.	Jr.	La Grande
Klinghammer, Reinhold M.	Agri.	Sr.	Elgin
Knapp, Howard Seymour	M. A.	T. Yr.	Davenport, Wash.
Knight, Ernest Field	Com.	Spec.	Vancouver, Wash.
Knight, Florence Lillian	H. E.	Jr.	San Luis Obispo, Calif.
Knoeff, Arthur Rolland	Min.	Fr.	Portland
Knowles, Inez	H. E.	Fr.	La Grande
Knox, Elsie Lydia	H. E.	Voc.	Fossil
Knox, Leland Jay	Com.	Sr.	Fossil
Kocken, Walter Joseph	Agri.	Fr.	Cleveland
Koenig, Walter Jacob	Agri.	Jr.	Rock Island, Ill.
Koeppel, Oliver Oscar	M. A.	S. Yr.	Portland
Kooken, Katherine	H. E.	Sr.	Ellensburg, Wash.
Koons, Hubert Edson	Agri.	Sr.	Orland, Calif.
Kotan, Mary	Com.	Fr.	Crabtree
Kreps, Russell	Agri.	Spec.	Laurel, Wash.
Kroner, Leo	M. E.	Sr.	Portland

Name.	Course.	Rank.	Home Address.
Krueger, Clarence William.....	E. E.	Fr.	St. Johns
Kruger, Herbert William	Min.	Jr.	Sherwood
Kuks, Anna	H. E.	Soph.	Milwaukee
Kurtz, Martin Ogara	Com.	Fr.	Corvallis
Kyle, Gertrude	H. E.	Fr.	Albany
Kyle, Gray	Com.	Spec.	Portland
Lafky, Ernest Herman	Agri.	Sr.	Corvallis
Lafky, Herman	Agri.	Fr.	La Grande
Laird, Erman	H. E.	Fr.	Pleasant Hill
Laird, Freda	H. E.	Fr.	Pleasant Hill
Laird, Ralph	Agri.	Jr.	Pleasant Hill
Lake, Coral	For.	Fr.	Boring
Lake, Emery Dudley	Agri.	Sr.	Eugene
Lamb, Floyd	Agri.	Voc.	Dillard
Lamb, Howard	Agri.	Jr.	Fossil
Lamoureux, Louis	Agri.	Soph.	Ft. Hancock, N. J.
Lamoureux, Thomas Liggett.....	Agri.	Jr.	Ft. Hancock, N. J.
Lamson, Maude	H. E.	Fr.	Cottage Grove
Lance, Neely Samuel	Agri.	Soph.	Corvallis
Landreau, Catherine	H. E.	Voc.	Corvallis
Lane, Bernice	H. E.	Fr.	Corvallis
Lane, Dorothy	H. E.	Fr.	Corvallis
Lane, Vivian	H. E.	Jr.	Harrisburg
Langton, James Theo	M. E.	Fr.	Newberg
Lankenau, Walter	For.	Fr.	Bronx, N. Y.
Lankins, Hazel	H. E.	Fr.	Hubbard
Lansdale, Zane Arthur	C. E.	Jr.	Weston
Larson, Adolph Leonard.....	Agri.	Spec.	Astoria
Larson, Carl Julius	M. E.	Soph.	Marshfield
Larson, Clarence Clifford.....	Com.	Fr.	Payette, Idaho
Larson, Raymond Gilbert	Agri.	Voc.	Fairfield, Iowa
Larsen, Mable	H. E.	Voc.	White Salmon, Wash.
Larsen, Walter Winifred.....	I. E.	Sr.	Laurel
Lasker, Adhar Chandra.....	E. E.	Soph.	Calcutta, India
Lasswell, Avery Lloyd.....	Com.	Spec.	Portland
Lasswell, Sidney Smith.....	Com.	Soph.	Portland
Lawrence, Sylvester	Agri.	Spec.	Portland
Laythe, Leo	Agri.	Jr.	Harriman
Layton, Ernest	Agri.	Voc.	Knab, Wash.
Leavell, Leonard	Hi. E.	Fr.	Klickitat, Wash.
Lee, Bernard	Agri.	Fr.	Meridian, Idaho
Lee, George Olin	C. E.	Jr.	Maltby, Wasn.
Leech, Archer Olin	M. E.	Fr.	Albany
Leeper, Enid Glenda	Com.	Sr.	Corvallis
Legg, Gladys	H. E.	Fr.	Portland
Leibner, Emil	Agri.	Fr.	Albany
Leisy, Harvey	M. A.	S. Yr.	Salem
Leland, Randolph Elliott.....	Agri.	Fr.	Los Angeles, Calif.

Name.	Course.	Rank.	Home Address.
Letellier, George	Com.	Spec.	Mill City
Levage, Harry Vernon	Agri.	Soph.	Florence
Leweaux, Victor	Phar.	Sr.	Corvallis
Lewis, Claudia	Opt.	.....	Corvallis
Lewis, Mattie	H. E.	Fr.	Lebanon
Lewis, Paul	Agri.	Fr.	Lents
Likins, Joseph Irving	M. E.	Fr.	Portland
Lilly, Cecile	H. E.	Voc.	La Grande
Linderman, Laird	Agri.	Voc.	Corvallis
Lindquist, Eric Arthur	M. A.	F. Yr.	New Hazleton, B. C.
Lindsay, Alexander Lewis	Agri.	Jr.	Hilo, Hawaii
Lines, Mary Janes	H. E.	Spec.	Albany
Lines, Ruth Jay	Opt.	.....	Corvallis
Littler, Florence	H. E.	Fr.	Forest Grove
Locker, Leonard Joseph	M. E.	Jr.	Burns
Logan, Arthur Evan	Com.	Jr.	Escondido, Calif.
Logan, Helen Elizabeth	Opt.	.....	Escondido, Calif.
Long, Howard Allen	Com.	Soph.	Portland
Long, Yick	Com.	Jr.	Canton, China
Loof, Hans Walter	For.	Jr.	Oak Harbor, Wash.
Loosley, Claude Frederick	Agri.	Sr.	Ft. Klamath
Lorence, Jennings	M. E.	Fr.	Monmouth
Lorence, Ruby Ann	Opt.	.....	Monmouth
Lorenz, Paul	Com.	F. Yr.	Grants Pass
Loughary, Edithe	H. E.	Fr.	Monmouth
Loughary, Ivan Hill	Agri.	Jr.	Monmouth
Loveland, Harold	Agri.	Fr.	Pomona, Calif.
Lowe, Leta Gwyneth	H. E.	Fr.	La Moure, N. Dak.
Lowe, Thomas Julian	Agri.	Fr.	Nyssa
Lowell, Arthur	Agri.	Soph.	Wasco
Lowell, Carlton	Agri.	Voc.	Wasco
Lowell, James Moores	Agri.	Spec.	Roy, Wash.
Lowry, Ralph William	Agri.	Soph.	Corvallis
Lucas, Elva Alice	Opt.	.....	Corvallis
Luescher, Rosalie	H. E.	Voc.	Fairview
Lundeen, Arthur Robert	L. E.	Jr.	Rock Island, Ill.
Lundgren, Carl Oliver	Agri.	Fr.	Puyallup, Wash.
Lutz, Arthur William	Agri.	Sr.	Santa Ana, Calif.
Luxton, William Lee	Com.	Spec.	Idaho Falls, Idaho
Lyster, Kathleen	H. E.	Sr.	Corvallis
McBurney, Mrs. Hazel Powers	H. E.	Sr.	Corvallis
McCallister, Roland Chester	Min.	Fr.	Prineville
McClellan, Thomas Richard	Agri.	Jr.	Turner
McCoffrey, Lawrence Martin	L. E.	Fr.	Corvallis
McCollum, John	L. E.	Soph.	Salinas, Calif.
McCormick, Anna	H. E.	Jr.	Lebanon
McCormick, Harl Craig	I. A.	Jr.	Drain
McCormick, Alice	H. E.	Fr.	Marcola
McCormack, Eugene	Agri.	Fr.	Klamath Falls

Name.	Course.	Rank.	Home Address.
McCoy, Arthur Wallace	Agri.	Jr.	Puyallup, Wash.
McDermott, Katherine	H. E.	Sr.	Portland
McDermott, Mary	H. E.	Sr.	Portland
McDonald, Allie	H. E.	Sr.	Corvallis
McEween, Dan Franklin	Agri.	Fr.	Tillamook
McFadden, Curran Lane	Phar.	Sr.	Corvallis
McGeorge, William	C. E.	Soph.	Eugene
McGinnis, James Luther	Agri.	Sr.	Corvallis
McGogy, Donald Harker	E. E.	Soph.	McMinnville
McHenry, Bertha	H. E.	Spec.	Corvallis
McHenry, Muriel Esther	Com.	Jr.	Corvallis
McHugh, Sanford	L. E.	Fr.	Corvallis
McIntosh, Fern	H. E.	Voc.	Union
McIntyre, Frank	Com.	Spec.	Hartford, Conn.
McKay, James Douglas	Agri.	Fr.	Portland
McKim, Stanley	Agri.	Fr.	Oakland, Calif.
McMaster, Cedric Stuart	Agri.	Fr.	Corvallis
McMinds, Elvin	Agri.	Fr.	Lorane
McMinn, Bryan Towne	M. E.	Fr.	Portland
McMinn, Grace Blanche	Opt.	.....	Portland
McMinn, Ray Ben	M. E.	Soph.	Portland
McNamee, George Paul	I. A.	Soph.	Portland
McNaughton, Margaret	H. E.	Voc.	Headquarters, B. C.
McPherson, Daisy	H. E.	Soph.	Pendleton
McQuaid, Zena	H. E.	Spec.	Portland
McVicar, Ward	Agri.	Fr.	Los Angeles, Calif.
McWilliams, Kenneth	Com.	Fr.	Ashland
MacDonald, Helen Louise	H. E.	Fr.	Corvallis
Macpherson, William	Agri.	Sr.	Pasadena, Calif.
Maddox, George Anthony	M. A.	T. Yr.	Roseburg
Maddux, George	Agri.	Fr.	Ontario
Maginnis, Mabel	Com.	Spec.	Abingdon, Ida.
Makinson, Ralph	Agri.	Soph.	New Plymouth, Ida.
Manary, Gertrude	H. E.	Fr.	Portland
Manning, Kenneth	Agri.	Spec.	Los Angeles, Calif.
Manock, Nathan Edwin	Phar.	Soph.	Corvallis
Manuel, Mildred	H. E.	Jr.	Oakland, Calif.
Manula, Wayne	E. E.	Jr.	Astoria
Markham, Arthur Gordan	Agri.	Sr.	Corvallis
Marsh, Lee Daniel	Agri.	Voc.	Aurora
Martin, Margaret	H. E.	Sr.	Corvallis
Martin, Porter Wilson	M. E.	Soph.	Corvallis
Marvin, Julia	H. E.	Sr.	Enterprise
Mason, Ben	M. E.	Fr.	Puyallup, Wash.
Mason, Walter Harold	I. A.	Jr.	Ione
Mateer, Ruth Mariam	H. E.	Jr.	Nampa, Idaho
Mather, Arthur Gilmore	Min.	Sr.	Clackamas
Mather, Horace	Agri.	Fr.	Geneva, Wash.
Maxwell, Claude	Phar.	Spec.	Klamath Falls

Name.	Course.	Rank.	Home Address.
Maxfield, Russell	Agri.	Voc.	Payette, Idaho
May, Lula Litten	H. E.	Fr.	Monkland
Mayhew, Spencer	Agri.	Jr.	Joseph
Medler, Evelyn	H. E.	Voc.	Wasco
Meek, Margaret	H. E.	Soph.	Oakland, Calif.
Mehl, Paul	Agri.	Sr.	Chicago, Ill.
Meier, Albert	Agri.	Fr.	Hillsdale
Meiser, Mrs. Bessie	Com.	F. Yr.	Tygh Valley
Mendenhall, Marie	H. E.	Fr.	Everett, Wash.
Mercer, Helen	H. E.	Soph.	Salem
Meshier, Sophie	H. E.	Fr.	Portland
Metzger, Floyd Sanford.....	Com.	Soph.	Gresham
Metzler, Ivan	Com.	Fr.	Corvallis
Meyers, Cornelius William.....	Min.	Soph.	Portland
Meyers, Cyril Lawrence.....	Min.	Soph.	Portland
Meyers, Joseph Donald	Com.	Sr.	Salem
Mickel, George	Phar.	F. Yr.	Corvallis
Michelbrook, Roy	M. E.	Jr.	McMinnville
Middlekauff, Donald	Agri.	Jr.	Lewiston, Idaho
Middlekauff, Harold	Agri.	Jr.	Lewiston, Idaho
Middlekauff, Mark Humbert.....	Agri.	Jr.	Corvallis
Miles, Edward	Com.	F. Yr.	Evans
Millar, Alexander John	Min.	Fr.	Clayburn, B. C.
Miller, Eva	H. E.	Jr.	Fillmore, Ill.
Miller, Gail	Agri.	Spec.	Forest Grove
Miller, Harold Aubrey	Com.	S. Yr.	Corvallis
Miller, Harry Dale	Agri.	Voc.	Corvallis
Miller, Harvey	Min.	Soph.	Lexington
Miller, Hellen	H. E.	Soph.	Corvallis
Miller, Hope Beatrice	Opt.	.....	Portland
Miller, Julia	H. E.	Sr.	Amity
Miller, Leo Waldemore	E. E.	Fr.	Portland
Miller, Marjorie	H. E.	Voc.	Union
Miller, Roy Edmund	Agri.	Sr.	Spokane, Wash.
Miller, William Franklin.....	Com.	Fr.	Newberg
Milliken, Damon	Agri.	Jr.	Ontario
Mills, Edna	H. E.	Sr.	Forest Grove
Mills, Harold Milton	Min.	Soph.	Denzer
Minsinger, David	Com.	Jr.	Portland
Mintonye, Clare	Agri.	Voc.	Coquille
Mitchell, Grace Elizabeth	H. E.	Sr.	Medford
Mitchell, Lloyd	Agri.	Fr.	Boise, Idaho
Mitchell, Thomas	Agri.	Voc.	Langlois
Mix, Ira Delbert	Com.	Soph.	Independence
Moberg, James	E. E.	Fr.	Astoria
Moe, Forrest Lester	Agri.	Sr.	Hood River
Monger, Walter Victor	E. E.	Jr.	Parkplace
Moody, Charlotte	H. E.	Fr.	Pasadena, Calif.
Moore, Frank Waltz	Com.	Spec.	Corvallis

Name.	Course.	Rank.	Home Address.
Moore, Gladys Mae	H. E.	Voc.	Moro
Moore, Jesse	Agri.	Sr.	Harrisburg
Moore, Leland Bernard	Agri.	Soph.	Gresham
Moore, Merle	M. E.	Jr.	Corvallis
Moore, Myra	H. E.	Fr.	Corvallis
Moore, Willetta	H. E.	Jr.	Eugene
Morback, George	E. E.	Fr.	Sherwood
Morgan, Beulah Inez	H. E.	Fr.	Corvallis
Morgan, Ralph Lester	Agri.	Soph.	Corvallis
Morgan, Silas Bailey	Agri.	Fr.	Medford
Morgan, Victor	Agri.	Jr.	Edenbower
Morgan, Walter John	Agri.	Soph.	Portland
Mornhinweg, Charles	For.	Fr.	Brownsville
Morris, Homer	M. E.	Fr.	Yamhill
Morris, Joseph Theodore	Opt.	.....	Gettysberg, Pa.
Morris, Ruth	H. E.	Fr.	Enumclaw, Wash.
Morris, Sarah	H. E.	Sr.	Rainier
Morrison, Clarence	S. E.	Fr.	Grass Valley
Morrison, Eugene Franklin	Min.	Fr.	Williams
Morrison, Ruth	H. E.	Jr.	Hood River
Morse, Wilmetta	H. E.	Jr.	West Lafayette, Ind.
Morton, Ruth	H. E.	Fr.	Hood River
Mosley, David Clayborn	C. E.	Soph.	Corvallis
Moss, Thompson West	M. E.	Fr.	Payette, Idaho
Motley, Jesse William	I. A.	Sr.	Cove
Motz, Frederick Allen	Agri.	Soph.	Rock Island, Ill.
Muck, John Edgar	M. E.	Sr.	St. Johns
Mudge, Frank	Com.	F. Yr.	Knappa
Mulkey, Oren	E. E.	Jr.	Myrtle Creek
Munford, Ruby Elizabeth	H. E.	Jr.	Vancouver, Wash.
Murneek, Andred Edward	Agri.	Jr.	Talsen, Russia
Murray, George	Agri.	Voc.	Boise, Idaho
Murphy, Clara May	H. E.	Soph.	Portland
Murphy, Foster McKinley	Agri.	Sr.	Evanston, Ill.
Murphy, Franklin Thos.	Agri.	Soph.	Alhambra, Calif.
Myers, Clarence	Agri.	Jr.	Moneta, Calif.
Myers, Francis	M. E.	Fr.	Corvallis
Myers, Ruth	Opt.	.....	Corvallis
Myers, Stanley	E. E.	Fr.	Corvallis
Nash, Jack Walker	C. E.	Jr.	Albany
Neal, Mrs. E. T.	H. E.	Spec.	Corvallis
Neal, Martina	H. E.	Fr.	Corvallis
Negberg, Grace Claire	H. E.	Spec.	Seattle, Wash.
Neil, Angeline	H. E.	Voc.	Ashland
Nelson, Kenneth	Agri.	Sr.	Eugene
Nelson, Willard Young	C. E.	Jr.	Lafayette
Nesbitt, Clarence Scott	Agri.	Fr.	New Plymouth, Ida.
Nestelle, Fred Washington	Agri.	Fr. So.	Bellingham, Wash.
Newcombe, Gilbert Rockwell	For.	Fr.	Campbell, Calif.

Name.	Course.	Rank.	Home Address.
Newell, Joseph Webster	Agri.	Soph.	Portland
Newins, Geraldine	H. E.	Jr.	Patchogue, N. Y.
Newman, Erbine	Agri.	Fr.	Salem
Newman, Meier	Com.	Spec.	Portland
Newmyer, Ruth	H. E.	Jr.	Salem
Newton, Bessie	H. E.	Voc.	Gold Hill
Niblen, Amy	H. E.	Fr.	Portland
Niblin, Ruth	H. E.	Fr.	Portland
Nichols, Fred	Agri.	Fr.	Glendale, Calif.
Nichols, Harold	Agri.	Fr.	Tacoma, Wash.
Nichols, Tressa Elizabeth	H. E.	Spec.	Corvallis
Nolan, Victor	Com.	Soph.	Corvallis
Noles, Carl Robert	Com.	Soph.	Dundee
Nordling, David	M. E.	Soph.	Mulino
Noren, Carl Albin	Agri.	Sr.	Reedley, Calif.
Norman, Ruth	Com.	Soph.	Milton
Norris, William Thomas	Agri.	Voc.	Ft. Klamath
Norton, Lola	H. E.	Soph.	Vacaville, Calif.
Norton, Mabel	H. E.	Jr.	Vacaville, Calif.
Norton, Walter Bert	Agri.	Soph.	Corvallis
Nutting, Hazel	H. E.	Voc.	Silverton
Oakes, Charles Ernest	E. E.	Sr.	Corvallis
Oakes, Ed.	For.	Fr.	Corvallis
Oakes, Mary	H. E.	Jr.	Grants Pass
O'Harra, Herman	Agri.	Fr.	Weston
O'Neill, William James	L. E.	Soph.	Chippewa Falls, Wis.
Oliver, Alfred	Agri.	Fr.	Salem
Olmsted, Irl Louis	E. E.	Sr.	Enterprise
Olsen, Jens	Agri.	Sr.	Milwaukee
Ono, Robert Tokiso	Agri.	Jr.	Niida Mura, Japan
Opstad, Melvin Otto	Agri.	Voc.	Blaine, Wash.
Orem, Elsie	H. E.	Jr.	Klamath Falls
Osborne, Gifford Lawson	M. A.	F. Yr.	Aurora
Osburn, Orren Edgar	E. E.	Fr.	Mosier
Ostrander, Aubrey	Agri.	Fr.	Portland
Otis, Ralph Grey	Agri.	Jr.	Newberg
Overholser, Leroy	Com.	Jr.	Albany
Owens, Mrs. Elizabeth	H. E.	Spec.	Corvallis
Page, Charles Culver	Agri.	Spec.	Crookston, Minn.
Paine, Edward Allen	E. E.	Soph.	Portland
Paine, Howard	Agri.	Sr.	Portland
Palmer, Charles	Phar.	F. Yr.	Baker
Palmer, Ralph Russell	Phar.	Jr.	Corvallis
Palmer, Thomas Edward	Agri.	Voc.	Fossil
Palmer, Walter	Phar.	Fr.	Grand Junction, Colo.
Palmquist, Raymond Albert	E. E.	Soph.	Gresham
Parker, Lorene	H. E.	Sr.	Salem
Paroni, Romeo	Agri.	Fr.	Berkeley, Calif.

Name.	Course.	Rank.	Home Address.
Parpala, Taimie	Agri.	Jr.	Nasel, Wash.
Parr, Fern	H. E.	Jr.	Woodburn
Parrish, Fairfax Hayes	H. E.	Sr.	Corvallis
Parrish, Philip Hammond	Agri.	Soph.	Corvallis
Parrish, Robert Arthur	Agri.	Soph.	Corvallis
Partin, Rae	H. E.	Fr.	Summer Lake
Passmore, Dorothy	H. E.	Jr.	Tualatin
Patterson, Margaret	H. E.	Fr.	Ashland
Patterson, Winifred Emma	H. E.	Sr.	Corvallis
Patton, Harry	L. E.	Soph.	Macleay
Paull, James Gregory	Agri.	Fr.	Los Angeles, Calif.
Paulsen, Edmond	L. E.	Soph.	Portland
Payne, Lois	H. E.	Voc.	Corvallis
Payne, William	Agri.	Fr.	North Platte, Nebr.
Peabody, Natalie	Opt.	.....	Castle Rock, Wash.
Pearce, Pearl	Com.	F. Yr.	Roseburg
Pearcy, Harry Leland	Agri.	Jr.	Portland
Pearson, Roderic	C. E.	Jr.	Portland
Pechin, William Grover	Com.	Soph.	Forest Grove
Peterson, Inez	H. E.	Fr.	Corvallis
Peterson, Ira	Agri.	Fr.	Corvallis
Pettis, Edward Valentine	Agri.	Fr.	San Francisco, Calif.
Pettycrew, Earl Milton	Agri.	Fr.	Salem
Phelps, Merle	Com.	Spec.	Hermiston
Phetteplace	Phar.	Spec.	The Dalles
Phillips, Walter	Com.	Fr.	Ashland
Philippi, Albert Roy	Agri.	Spec.	Early
Philippi, Leora	H. E.	Sr.	Early
Pierce, Loyd Byran	Agri.	Fr.	La Grande
Pietzker, Henry Fred	E. E.	Soph.	Portland
Pimm, Charles	E. E.	Soph.	Corvallis
Pickney, Dunbar	Agri.	Spec.	Aberdeen
Pine, William Douglas	Agri.	Fr.	Berkeley, Calif.
Pinkerton, Harry Bennett	Agri.	Fr.	Moro
Pirtle, Mary Louise	Opt.	.....	Albany
Pitman, John Elijah	Agri.	Jr.	Moneta, Calif.
Pitney, Mary Eleanor	H. E.	Fr.	Junction City
Plank, Esther	H. E.	Soph.	Woodburn
Planta, Clive Montgomery Fran- cis	Agri.	Spec.	Nanaimo, B. C.
Platt, Dwight Gilbert	M. E.	Soph.	Idaho Falls, Ida.
Plue, Vilas Leone	Com.	Soph.	Rainier
Polk, Clifford George	C. E.	Sr.	Corvallis
Polson, Nellie	H. E.	Fr.	Mt. Vernon, Wash.
Porter, Dale	E. E.	Fr.	McMinnville
Porter, Harry Baxter	M. E.	Jr.	Corvallis
Porter, Ted	Com.	Fr.	Halsey
Post, Clara Olga	Com.	Soph.	Blackly

OREGON AGRICULTURAL COLLEGE

Name.	Course.	Rank.	Home Address.
Post, Elmer Oren	Agri.	Soph.	Blackly
Potter, Genevieve	H. E.	Jr.	Salem
Potter, Roy Wadsworth	Agri.	Spec.	Salem
Powell, Charles Kelly	Agri.	Jr.	Corvallis
Powell, Frank Braxton	Agri.	Jr.	Monmouth
Powell, Lydia	H. E.	Fr.	Monmouth
Powell, Walter Irving	Com.	S. Yr.	Bellingham, Wash.
Powell, William Lester	For.	Spec.	Azusa, Calif.
Prather, Mildred	H. E.	Voc.	Corvallis
Prentice, H. S.	Agri.	Voc.	Madison, Ohio
Price, Ray Eugene	Com.	Spec.	Corvallis
Price, Lloyd	M. E.	Spec.	Scappoose
Prill, Alice	H. E.	Jr.	Sparta, Wis.
Prindle, Ray	E. E.	Soph.	Payette, Idaho
Proctor, Will	Agri.	Fr.	Everett, Wash.
Probstel, John	Com.	S. Yr.	Big Pine, Calif.
Psychom, Constantine	Min.	Fr.	Ahmadocampos, Greece
Pugh, Linden Wallace	Com.	Voc.	Corvallis
Quisenberry, Perry Dwight	Phar.	F. Yr.	Monmouth
Raber, Morris	Com.	S. Yr.	Corvallis
Ragsdale, Gordon	Agri.	Fr.	Joseph
Ralston, Ruth Ann	H. E.	Spec.	Portland
Rand, Earl	Agri.	Soph.	Irrigon
Ratcliff, Elsie	Com.	Spec.	Scottsville, Kan.
Rawlings, Madeline	H. E.	Jr.	Albany
Ray, Howard	Agri.	Fr.	Roslyn, Wash.
Rea, Laura	H. E.	Fr.	Miltonvale, Kan.
Reber, Albert Roy	Agri.	Fr.	Kansas City, Kan.
Redmond, Agnes	H. E.	Fr.	Portland
Reed, Ada	H. E.	Fr.	Portland
Reed, Charles	Com.	F. Yr.	Gold Hill
Reed, Malcomb	E. E.	Fr.	Portland
Reed, Maurice Albert	Agri.	Fr.	Fresno, Calif.
Reese, Neilson Walker	Hi. E.	Fr.	Portland
Reese, Mrs. Ruth	Com.	Spec.	Corvallis
Reichart, Emanuel	Agri.	Soph.	New York, N. Y.
Reichart, Robert Roy	Com.	Soph.	Corvallis
Renfro, Charles	E. E.	Jr.	Eugene
Reynolds, Hugh Milton	Agri.	Soph.	Los Angeles, Calif.
Reynolds, Lee Edward	Agri.	Sr.	La Grande
Rice, Clarence DePuy	Agri.	Fr.	Prineville
Rice, Olive Gladys	H. E.	Spec.	Corvallis
Rice, Seaton Alanson	Min.	Fr.	Lebanon
Richards, Dale Everett	Agri.	Jr.	Kalispel, Mont.
Richards, Lorene	Com.	Soph.	Corvallis
Richardson, Rose	H. E.	Fr.	Tacoma, Wash.
Richey, Lester	For.	Fr.	Corvallis
Richman, Parnell	E. E.	Soph.	Sutherlin

Name.	Course.	Rank.	Home Address.
Richter, Henry	Agri.	Jr.	Salem
Rigdon, Harriett	H. E.	Jr.	Salem
Rippa, Wainard	Min.	Soph.	Portland
Riley, Chester Arthur	Com.	Sr.	Enterprise
Riley, Lorene	Opt.	.....	Baker
Rippen, Vernando Cecil	Agri.	Fr.	Portland
Ritchie, Douglas	Agri.	Fr.	Corvallis
Robbins, Charles Wiles	E. E.	Soph.	Corvallis
Robbins, Urban	Agri.	Spec.	Warm Springs
Roberts, Clyde	For.	Fr.	Portland
Roberts, Glen	Agri.	Sr.	Cove
Roberts, Jessamy	H. E.	Fr.	Portland
Roberts, Melvin Parker	Agri.	Fr.	Arcata, Calif.
Robinson, Paul Winfield	Phar.	Spec.	Corvallis
Robinson, Temple	Agri.	Spec.	Chicago, Ill.
Robson, Allan Edwing	M. E.	Jr.	Corvallis
Rock, John	Agri.	Voc.	Oretown
Rockhill, Ferne	Com.	Fr.	Riddle
Rodgers, Gladys	H. E.	Soph.	Gardena, Calif.
Rodgers, Hugh	Agri.	Fr.	San Jose, Calif.
Roehrig, Fredrick Austin	E. E.	Fr.	Pasadena, Calif.
Rogers, Mary	H. E.	Fr.	Corvallis
Rogers, Wilbur Leslie	M. E.	Fr.	Corvallis
Rohde, George Robert	Phar.	Soph.	Portland
Rohr, Frank Charles	M. E.	Jr.	Astoria
Rollins, John	E. E.	Soph.	Corvallis
Romig, Frank Vernon	M. E.	Jr.	McCoy
Roofer, William	Com.	Voc.	Antelope
Roseman, Charles Hammer	Agri.	Jr.	Corvallis
Roseman, Edward	Agri.	Jr.	Corvallis
Rowntree, Kenneth	Min.	Fr.	Hillsdale
Royse, Albert Lee	For.	Fr.	Dayton, Wash.
Rundell, Hugh Dean	M. E.	Fr.	Newberg
Runyan, Wilbur	Hi. E.	Fr.	Portland
Russell, Anna Boyd	H. E.	Sr.	Portland
Russell, Frank	L. E.	Soph.	Portland
Russell, Henry Woodruff	Com.	Sr.	Beaver Hill
Rutledge, Anna	H. E.	Sr.	Corvallis
Ryan, William Douglas	Hi. E.	Fr.	London, England
St. Martin, Willard	Phar.	Spec.	Corvallis
Samuelson, Carl	M. A.	S. Yr.	Colton
Sanders, Lewis Claude	I. A.	Soph.	Ashland
Sanderson, Maysel	H. E.	Jr.	Klamath Falls
Sather, John Adolph	Com.	Sr.	Bend
Sato, Juemon	Agri.	Spec.	Sado, Japan
Savage, Robert	M. E.	Sr.	Salem
Sawyer, Doris	H. E.	Fr.	Salem
Schafer, Bernice	H. E.	Fr.	Portland
Schmidt, Ernest Carl	Com.	F. Yr.	Corvallis

OREGON AGRICULTURAL COLLEGE

Name.	Course.	Rank.	Home Address.
Schmidt, Max	Agri.	Voc.	Shaniko
Schneider, Nicholas	Agri.	Fr.	Portland
Schooley, Paul Tafel	Agri.	Spec.	Santa Ana, Calif.
Schoth, Albert Joseph	Agri.	Fr.	Oregon City
Schott, Rena	H. E.	Fr.	Salem
Schram, Lloyd Chester	E. E.	Jr.	Oregon City
Schreiber, Martin Andrew	Agri.	Jr.	McMinnville
Schrepel, Oliver Henry	Agri.	Jr.	Corvallis
Schrieber, Mrs. W. C.	Opt.	.....	Corvallis
Schrodt, Philip	Agri.	Voc.	Vancouver, B. C.
Schroeder, Bertha	H. E.	Jr.	Portland
Schubert, Ben	L. E.	Jr.	Silverton
Schubert, George	Com.	S. Yr.	Corvallis
Schultz, Elsie	H. E.	Jr.	Gresham
Schuster, Earl	Phar.	Soph.	Corvallis
Scofield, Amos	Agri.	Sr.	Asusa, Calif.
Scott, Albert Miles	Agri.	Soph.	Ada
Scott, Clarence Vincent	Agri.	Soph.	Chicago, Ill.
Scott, Leo	Agri.	Spec.	Inicana, Canada
Scott, Loyal Edgar	Phar.	S. Yr.	Creswell
Scott, Mary Ritchie	Agri.	Spec.	Corvallis
Scrivner, Ina	H. E.	Jr.	Boise, Idaho
Sears, Briton Wallis	M. E.	Soph.	Portland
Seely, Elmer Glen	Agri.	Jr.	Wilsonville
Seeley, June	H. E.	Sr.	Independence
Seibert, Harry	E. E.	Jr.	Pendleton
Selby, Halbert	Agri.	Soph.	Bellingham, Wash.
Seley, Frances Miriam	H. E.	Fr.	Newport
Selph, Raymond	Agri.	Fr.	Los Angeles, Calif.
Sendlinger, William	Agri.	Voc.	Mosier
Sessions, Philip	Com.	Spec.	Portland
Shank, Arthur	Agri.	Fr.	Seattle, Wash.
Shankland, Albert	I. A.	Fr.	Estacada
Shaw, James	Agri.	Sr.	Aberdeen, Wash.
Shaw, Ralph	Agri.	Fr.	Portland
Shedd, Bertha Lucile	H. E.	Fr.	Shedd
Shepard, Fred Cecil	Agri.	Jr.	Roosevelt, Wash.
Sherwood, Rose	H. E.	Jr.	Portland
Shields, Harley	Phar.	Jr.	Amity
Shirley, James Carlton	Phar.	Sr.	McMinnville
Sieberts, Adolph	Com.	Soph.	Portland
Sigfrit, Edwin Leo	Min.	Fr.	Mitchell
Sigurdson, Anna	H. E.	Fr.	Warrenton
Simpson, John, Jr.	M. E.	Soph.	Portland
Sims, Andrew Raymond	Min.	Fr.	Woodburn
Sinclair, Freeman William	Com.	Soph.	Pasadena, Calif.
Singh, Mahadeo	Agri.	Fr.	Dadnpore, India
Sinks, Victor	E. E.	Jr.	Portland
Skelton, Albert Gordon	C. E.	Soph.	Corvallis

Name.	Course.	Rank.	Home Address.
Skelton, Mary	H. E.	Jr.	Corvallis
Skidmore, Maude	H. E.	Voc.	Curtin
Smilie, Robert Stanley.....	L. E.	Fr.	Oakland, Calif.
Smyth, Darius	Phar.	Jr.	Burns
Smock, John	For.	Soph.	Portland
Smith, Clifton	Min.	Jr.	Salem
Smith, Elizabeth	H. E.	Jr.	Corvallis
Smith, Elva	H. E.	Fr.	Portland
Smith, Harvey	Agri.	Fr.	Gardena, Calif.
Smith, Howard	Agri.	Soph.	Gardena, Calif.
Smith, Mitchell	Agri.	Spec.	Blalock
Smith, Kathryn	H. E.	Spec.	Marshfield
Smith, Leone	H. E.	Fr.	Forest Grove
Smith, Margrette Irene.....	Com.	Fr.	Medford
Smith, Mimeon	Phar.	Sr.	Portland
Smith, Vincent	Com.	Soph.	Portland
Smith, Wallace	Agri.	Voc.	Corvallis
Soden, Mildred	H. E.	Sr.	Portland
Soderstrom, Victoria	H. E.	Fr.	Halsey
Sodhi, Charn Singh	Com.	Soph.	Quitta, India
Somers, Eugenia	Agri.	Jr.	Corvallis
Somers, George Brooks.....	Min.	Fr.	Ft. Wayne, Ind.
Soo, Taki Herbert	Agri.	Jr.	Hong Kong, China
Soth, Rodney	Agri.	Spec.	Pendleton
South, Lawrence Gardiner.....	Com.	S. Yr.	Juntura
Southwick, Ralph	Agri.	Fr.	Salem
Spalding, Donald	For.	Fr.	Lowell, Mass.
Spalding, Clifford	L. E.	Jr.	Salem
Sapuling, Hubert Albert	Agri.	Jr.	Portland
Spencer, Lucile	H. E.	Fr.	Puyallup, Wash.
Spindler, Walter Arthur	Agri.	Soph.	Portland
Sprague, Hazel	H. E.	Jr.	Corvallis
Stambach, George Mahlon	Agri.	Sr.	Pasadena, Calif.
Standley, Josie	H. E.	Voc.	Myrtle Point
Stark, Arline	H. E.	Fr.	Eugene
Stark, Leslie	Com.	Fr.	Holdredge, Nebr.
Steiner, John Godfrey	M. E.	Soph.	Portland
Steinmetz, Avery Harold.....	Agri.	Sr.	Portland
Stevenson, Ernestine	Com.	Soph.	Corvallis
Steusloff, May	H. E.	Sr.	Salem
Stevens, Horace James	Agri.	Jr.	Tustin, Calif.
Stidd, Charles Leland	For.	Soph.	Corvallis
Stidd, Erma Phoebe	Com.	Spec.	Corvallis
Stimpson, Etta	H. E.	Fr.	Corvallis
Stinson, Richard Brodick	M. E.	Fr.	Ridgefield, Wash.
Stirling, Janet	H. E.	Sr.	Burns
Stokes, Iva	H. E.	Sr.	Eugene
Stone, Herman Al	L. E.	Fr.	Woodburn
Stoneburg, Hugo	Agri.	Jr.	Coburg

Name.	Course.	Rank.	Home Address.
Stoppenbach, Donald	E. E.	Jr.	Portland
Story, Carl	Com.	Jr.	Airlie
Storz, Charles	Phar.	Jr.	Portland
Storm, Earl	For.	Fr.	Milton
Stout, Erwin Cory	Agri.	Spec.	Indianapolis, Ind.
Stow, Wm. Raymond	Agri.	Fr.	Salinas, Calif.
Strain, Clayton Preston	Agri.	Sr.	Pendleton
Straughn, James Albert	I. A.	T. Yr.	Pendleton
Straughn, Orson	Agri.	Fr.	Pendleton
Streiff, Albrecht	E. E.	Soph.	Hillsdale
Strome, Carey Lloyd	Agri.	Jr.	Corvallis
Strome, Glenn Smyth	Agri.	Fr.	Eugene
Struble, Frank Howard	I. A.	Fr.	Corvallis
Struck, Martha	H. E.	Soph.	Hood River
Stubblefield, Nellie	H. E.	Sr.	Enterprise
Struwe, Herman Carl	M. A.	S. Yr.	Aurora
Suffron, Fay Oakley	C. E.	Sr.	Paso Robles, Calif.
Supple, Joe	Agri.	Soph.	Oakland, Calif.
Sutherland, Frank Gilette	Agri.	Soph.	Honolulu, Hawaii
Sutherland, Margaret	H. E.	Soph.	Portland
Sutherland, May	H. E.	Sr.	Honolulu, Hawaii
Sutton, Harry Allen	Min.	Jr.	Aumsville
Swartout, Ivan Albert	Phar.	Fr.	Hood River
Sweeney, Anna Grace	H. E.	Sr.	Murphy
Tadlock, Hulbert	E. E.	Sr.	Corvallis
Tadlock, Laura	H. E.	Fr.	Corvallis
Tagg, Elvia Wain	H. E.	Sr.	Warrenton
Tagg, Lystra	Opt.	.....	Warrenton
Tagg, Verna Mary	Com.	Sr.	Warrenton
Tamerlane, Rex	M. E.	Jr.	Portland
Tanner, Clifford Gilbert	Agri.	Soph.	Morro, Calif.
Tartar, Nicholas Linn	Phar.	Sr.	Corvallis
Taylor, Armand	For.	Spec.	Medford
Taylor, Everett	I. A.	Soph.	Corvallis
Taylor, Harold Roy	Agri.	Jr.	Baker
Taylor, Jesse LaVerne	C. E.	Sr.	Oregon City
Thayer, Harold William	Agri.	Fr.	Rainier
Theobald, Wanda	H. E.	Fr.	Silverton
Thomas, George Randolph	E. E.	Sr.	Portland
Thomas, George	Agri.	Fr.	Auburn, Ind.
Thomas, Ralph William	C. E.	Jr.	Corvallis
Thomas, Robert	Agri.	Voc.	Anlauf
Thompson, Cecil Adelbert	Agri.	Fr.	Missoula, Mont.
Thompson, Earl Harstad	Agri.	Jr.	Pasadena, Calif.
Thompson, Elmer	Agri.	Soph.	Le Roy, Minn.
Thompson, Gertrude	H. E.	Fr.	Portland
Thoms, Harold Wayne	Min.	Fr.	Jefferson
Thornburg, Oren Rex	Com.	S. Yr.	Powell, Wyo.

Name.	Course.	Rank.	Home Address.
Thrailkill, Jay Everett	M. E.	Fr.	Weiser, Idaho
Thrift, Belle	H. E.	Sr.	Coquille
Throne, Robert Franklin.....	M. E.	Soph.	Ashland
Tidball, Lynn Hudson.....	M. E.	Soph.	Corvallis
Tillery, Merle	Com.	Soph.	Corvallis
Tillery, Orley Dewitt	Agri.	Voc.	Rock Creek
Tillery, Walker Boutelle	For.	Soph.	Arcata, Calif.
Tillotson, Ruth	H. E.	Voc.	Lebanon
Tinker, Harold William	Agri.	Sr.	Corvallis
Titus, Zelda	H. E.	Fr.	Lebanon
Tomlinson, Arthur Raymond.....	C. E.	Jr.	Albany
Towne, Elbert Louis	Agri.	Fr.	Carrolton
Tracy, Alice Merle	H. E.	Jr.	Salem
Trempp, Jess Clarence	For.	Soph.	Berkeley, Calif.
Trigg, Leslie Porter.....	Agri.	Voc.	Ferndale, Calif.
Trudel, Edward	M. A.	F. Yr.....	Eureka, Wash.
True, Mrs. Elsie	H. E.	Jr.	Sherwood
Tucker, Elmer	Phar.	Sr.	Weston
Tucker, Jay Wilbur	Opt.	.....	Gardena, Calif.
Tulley, Stewart	Agri.	Jr.	Wallowa
Turnbull, James Lockhart.....	Min.	Soph.	Mooreville
Turner, Arthur Edward	E. E.	Jr.	Corvallis
Turner, Harold Willard.....	I. A.	Soph.	Eugene
Turner, Jesse Oland	Agri.	Jr.	Heppner
Turned, Winnifred	H. E.	Jr.	Corvallis
Tuttle, Errett	Com.	Soph.	Boulder, Mont.
Tuttle, Le Roy	For.	Fr.	Cumberland, Wis.
Tuttle, Lulu Oleta	H. E.	Sr.	Boulder, Mont.
Tuttle, Ruth	H. E.	Fr.	Portland
Tweed, Robert	Agri.	Jr.	Ashland
Underwood, Edward	Agri.	Jr.	Boyd
Underwood, Joseph Marion	Min.	Fr.	Pasadena, Calif.
Underwood, Zetta.....	Com.	Sr.	Lebanon
Uyei, Nao	Agri.	Jr.	Ohyodo, Japan
Van Buskirk,	Agri.	Fr.	Portland
Van Couvering, Martin	Min.	Jr.	Riverside, Calif.
Vanderwall, Roy	Agri.	Sr.	Haines
Van Norden, Freeman	Agri.	Fr.	The Dalles
Van Orsdel, Clark	For.	Spec.	Dallas
Van Nuys, Edwin	Agri.	Voc.	Turner
Van Wyngarden, John	Hi. E.	Fr.	Caldwell, Idaho
Vaughn, Blanche	Com.	F. Yr.....	Smithfield, Ill.
Vedder, Harold Troxell	M. A.	S. Yr.	Grants Pass
Venstrand, Carl Peter	Min.	Sr.	Portland
Vestal, Edgar	Agri.	Jr.	Payette, Idaho
Vierhus, Albert Victor	Min.	Fr.	Oregon City
Vilas, George Warren	Com.	Soph.	Medford
Vilas, Ned Platt	Agri.	Jr.	Medford

OREGON AGRICULTURAL COLLEGE

Name.	Course.	Rank.	Home Address.
Vincent, George Sylvester	C. E.	Jr.	Sherwood
Vincent, Oliver Merrill	Agri.	Soph.	Corvallis
Virgil, Fannie	H. E.	Fr.	Klamath Falls
Visel, Nelson	Agri.	Soph.	Santa Ana, Calif.
Von Lehe, Herbert	Agri.	Fr.	Corvallis
Waddell, Robert	Agri.	Sr.	Long Beach, Calif.
Wade, Tracy William	E. E.	Sr.	Portland
Wagner, Henrietta	H. E.	Fr.	Laurel, Ind.
Wahlberg, Elizabeth	H. E.	Voc.	San Francisco, Calif.
Wakeman, Wm. James	For.	Soph.	Portland
Walker, Claude Gilbert	Agri.	Fr.	Fairbanks, Alaska
Walker, David Elra	M. A.	Spec.	McCoy, Ky.
Walker, Eva Estelle	H. E.	Jr.	Florence
Wallace, Glen William	Agri.	Voc.	Stanfield
Walton, Fremont Winston	Agri.	Soph.	Salem
Warner, Katherine	H. E.	Sr.	Portland
Washburne, James	Agri.	Fr.	Junction City
Wascher, Frank	Agri.	Soph.	Portland
Waterfall, Chales Hardy	Com.	Soph.	Vancouver, B. C.
Waterman, Fay	Phar.	Jr.	John Day
Watson, Georgia	H. E.	Fr.	Coquille
Watson, Irvin	Agri.	Fr.	Coquille
Watson, Lawrence Erle	Agri.	Fr.	Bremerton, Wash.
Wattenburger, Ina	H. E.	Fr.	Echo
Watters, William Harp	Min.	Soph.	St. Helen
Weaver, Clifford	Phar.	Spec.	Springfield
Weaver, Verna	H. E.	Soph.	Portland
Weller, Stanley	Agri.	Jr.	Corvallis
Weller, Theodore Warford	Agri.	Sr.	Corvallis
Wellman, Homer Leslie	Agri.	Fr.	Baker
Wendover, Royce Franklin	For.	Sr.	Stockton, Kan.
Weniger, Wanda	H. E.	Sr.	Corvallis
Werner, Richard John	Agri.	Soph.	Los Angeles, Calif.
Werth, Conrad	E. E.	Fr.	Newberg
West, Ralph Lovell	Agri.	Spec.	Westport
Wetteland, Rolf Theodore	M. E.	Jr.	Camas, Wash.
Wheeler, Alfleda	H. E.	Fr.	Corvallis
Wheeler, Alvin Wilbur	Agri.	Jr.	Ashland
Wheeler, Harold Edward	Com.	Fr.	Portland
Whipple, Gladys	H. E.	Soph.	Portland
Whitby, Clarence	Phar.	Fr.	Tacoma
Whitby, Harold	Agri.	Sr.	Corvallis
Whitby, J. Harris	Com.	Jr.	Corvallis
White, Cleo	H. E.	Jr.	McMinnville
White, Mary Jane	H. E.	Jr.	Corvallis
Whitehouse, Walter Robert	Agri.	Jr.	Sommerville, Mass.
Whitehouse, Wm. Edwin	Agri.	Sr.	Sommerville, Mass.
Whittlesey, Ludella Miriam	H. E.	Fr.	Springbrook

Name.	Course.	Rank.	Home Address.
Whitham, Earle	Agri.	Spec.	Corvallis
Wicks, Forest Thrift	M. E.	Soph.	Albany
Wiest, Margaret	H. E.	Sr.	Bend
Wiglesworth, Myra	Com.	Fr.	Union
Wilcox, George Burrell	Agri.	Spec.	Almont, Mich.
Wilcox, Lyle	Agri.	Jr.	Milton
Wilcox, Ralph	Com.	Soph.	Portland
Wilkes, Clair	Agri.	Soph.	Hillsboro
Wilkes, Rhea	H. E.	Jr.	Hillsboro
Wilkes, Ward	M. E.	Soph.	Hillsboro
Wilkins, Mitchell	Agri.	Sr.	Coburg
Wilkins, Wm. Elmer	Com.	Fr.	Clem
Willey, Earl Clark	M. E.	Fr.	Coquille
Williams, Claire Stanwood	M. A.	F. Yr.	Corvallis
Williams, Ivan	M. E.	Spec.	Aqutuck, N. Y.
Williams, John Floyd	Agri.	Sr.	Cove
Williams, Llewellyn Morris	Com.	Fr.	Corvallis
Williams, Miriam Blanche	H. E.	Jr.	Ft. Landerdale, Fla.
Williams, Philip Leonard	Agri.	Voc.	Portland
Williams, Richard Congle	Agri.	Spec.	Corvallis
Williams, Robert Franklin	Agri.	Fr.	Cove
Williams, William	E. E.	Jr.	Portland
Williamson, Charles Jacob	Com.	Sr.	Corvallis
Williamson, Louise Adelle	Com.	Fr.	Medford
Williamson, Pearl	H. E.	Jr.	Albany
Wilmot, Richard Kenneth	L. E.	Fr.	Portland
Wilt, Clarence Oliver	M. A.	F. Yr.	Corvallis
Wilson, David McKinnon	For.	Jr.	Linnton
Wilson, Isaac James	Agri.	Spec.	Corvallis
Wilson, Jalmar	M. E.	Fr.	Astoria
Wilson, James Albert	Agri.	Sr.	North Powder
Wilson, John	Agri.	Soph.	Corvallis
Wilson, Josepha	H. E.	Jr.	Meadville, Pa.
Wilson, Olive	H. E.	Soph.	Yoncalla
Wingert, Jacob Arthur	Agri.	Voc.	Harstine, Wash.
Wisdom, Everett Stanton	Agri.	Sr.	Portland
Wise, Clarence	Com.	Fr.	Corvallis
Witter, George Henry	M. E.	Spec.	Kent
Witzig, Ivy	H. E.	Jr.	Corvallis
Wolfe, Ira	Agri.	Soph.	Mt. Vernon, Wash.
Woodburn, Howard	L. E.	Soph.	Portland
Woodcock, Arthur James	Phar.	Fr.	Portland
Woodcock, Carol Wesley	M. E.	Soph.	Kerby
Woods, Le Roy	For.	Soph.	Cottage Grove
Woodworth, Grace	H. E.	Soph.	Portland
Woolley, Ivan Medhurst	Opt.	.....	Portland
Wootton, Wm. Barker	Opt.	.....	Astoria
Wortman, Everett	Com.	Spec.	Portland
Wright, Byron Charles	Agri.	Sr.	Portland

Name.	Course.	Rank.	Home Address.
Wright, Dorothy	H. E.	Fr.	Portland
Wright, Ethel	H. E.	Jr.	La Grande
Wright, Mark	For.	Soph.	Forest Grove
Wright, Ralph Van Fossen.....	Agri.	Sr.	Croton, Ohio
Wright, So Relle	Agri.	Fr.	San Gabriel, Calif.
Yates, Ethel	H. E.	Sr.	Salem
Yates, Eva	H. E.	Fr.	Corvallis
Yates, Lloyd	For.	Soph.	Corvallis
Yates, Olin	For.	Voc.	Chiloquin
Yates, Richard	Agri.	Soph.	Corvallis
Yeager, Francis De Witt	Agri.	Jr.	Centralia, Wash.
Yeatman, Sara	H. E.	Jr.	Oakland, Calif.
Yost, Dana Kenneth	Agri.	Fr.	Meridian, Idaho
Young, Earl	M. E.	Sr.	Portland
Young, Ellsworth	L. E.	Fr.	Portland
Young, Faith	H. E.	Sr.	Boring
Young, Nathan Lytle	Agri.	Spec.	Portland
Young, Vida	H. E.	Soph.	Salem
Zimmerman, Edward	Min.	Sr.	Yamhill
Zimmerman, Wilson Stuart.....	M. E.	Spec.	Portland
Zwicker, Arthur	Agri.	Sr.	Portland

SUMMER SCHOOL STUDENTS.

(Abbreviations indicate major courses as follows: Coll., College, including agriculture, home economics, manual training, etc.; Meth., methods in teaching industrial and other subjects in public schools; Prep., preparation for teachers' examinations; Agri., Boys' Agricultural Course; Mus., Special Music. Most students were registered in two or more of these courses.)

Name.	Course.	Home Address.
Abegg, Fred	Coll.	Portland
Alexander, George	Coll.	Minneapolis, Minn.
Alexander, Jean	Coll.	Los Angeles, Calif.
Allen, Ethel	Coll.	Corvallis
Allen, Rea	Coll.	Corvallis
Allworth, Helen Rae	Coll.	Crawford, Wash.
Alvard, Charles William.....	Coll.	Corvallis
Anderson, Ida	Meth.	Oneida, Wash.
Atherton, Leona Crawford.....	Coll.	Corvallis
Balcom, Judith	Meth.	Gold Hill
Bates, Margaret	Meth.	Redmond
Beals, Elvina Lovina	Coll.	Corvallis
Beck, Pearl	Coll.	Albany
Backwith, Harold	Agri.	Portland
Beebe, Nora	Meth.	Central Point
Beers, Ruby	Coll.	Corvallis
Benson, Mrs. J. S.	Meth.	Cottage Grove
Berchtold, Florence	Coll.	Corvallis
Boies, Etta	Coll.	Corvallis
Boies, Thurza	Coll.	Corvallis
Bolton, Verne	Agri.	Dufur
Bossinger, Mrs. Hazel	Coll.	Portland
Bouchet, Herman	Agri.	Condon
Boyd, Victor	Meth.	Roseburg
Brett, Sereno Elmer	Coll.	Portland
Brewer, Grace	Meth.	Portland
Brockman, Mildred	Coll.	Weiser, Ida.
Bryce, Daisy	Coll.	Corvallis
Burns, T. L.	Coll.	Corvallis
Burton, Mrs. Mabel Stevens.....	Coll.	Corvallis
Burton, Rupert	Agri.	Corvallis
Butterfield, Jessie	Mus.	Lebanon
Cain, Grace	Coll.	Corvallis
Calvin, Ben	Coll.	Corvallis
Calvin, George	Coll.	Corvallis
Cecil, Louise	Meth.	Portland
Chamberlain, Ruth	Meth.	Portland
Chenault, Ralph Garfield	Coll.	La Grande
Chioco, Juan	Coll.	Sto. Domingo, P. I.
Cohen, Benjamin Bernard.....	Coll.	Portland
Coleman, Lawrence	Coll.	Corvallis
Copeland, Mildred Frances.....	Coll.	Astoria

Name.	Course.	Home Address.
Corbett, Ruth Lillyn	Meth.	Corvallis
Cowgill, Helen	Meth.	Corvallis
Crockett, Edith	Coll.	Pendleton
Crower, Rae	Coll.	Corvallis
Cummings, Mrs. Hugh	Coll.	Corvallis
Dakin, Earl	Agri.	Portland
Darling, Jessie Ruth	Coll.	Thorne, N. Dak.
Darling, Lois Winnifield	Coll.	Thorne, N. Dak.
Davis, Percy Everett	Coll.	Corvallis
Davis, Robert	Meth.	Hillsboro
Dietsch, Frank	Coll.	Days Creek
Dryden, Winfield	Coll.	Corvallis
Ellsworth, Hazel Alma	Prep.	Boulder, Colo.
Enright, Mrs. L. H.	Meth.	Eugene
Enright, Marguerite	Coll.	Eugene
Fawcett, Hortensia Hazel	Meth.	Heppner
Finney, Gerald	Agri.	Gervais
Fisher, Marie Jean	Coll.	Portland
Fitts, Grace	Mus.	Corvallis
Fletcher, Allan Taylor	Coll.	Buell
Fraker, Katherine	Meth.	Oregon City
Gardner, Evelyn	Meth.	Lakeview
Gardner, Hattie	Meth.	Eugene
Garrett, Frances	Coll.	Eugene
Garrett, Lida Oakes	Meth.	Eugene
Garvin, Coral	Coll.	Corvallis
Garvin, Pearl Ethelyn	Prep.	Corvallis
Gates, Pearl	Coll.	Corvallis
Gilbert, W. B.	Coll.	Corvallis
Given, Harry	Agri.	Salem
Glaser, Franklin	Agri.	Lebanon
Goddard, Jackson	Meth.	Cottage Grove
Gruenig, Helen	Coll.	Corvallis
Ham, Oliver	Coll.	Corvallis
Hampton, Maggie Luella	Meth.	Rocca
Hansen, Beneta Kareen	Coll.	Corvallis
Hansen, Manette	Meth.	Corvallis
Hart, Otha	Meth.	Corvallis
Hart, Scott Park	Coll.	Albany
Hawley, Mary	Coll.	Corvallis
Hawley, Willa	Coll.	Corvallis
Haight, Rachel	Mus.	Corvallis
Hemphill, John	Agri.	Albany
Heath, Laura	Coll.	Corvallis
Hodgson, Marion Elizabeth	Coll.	Ashland
Holt, Ada	Coll.	Holliston, Mass.
Holt, Hazel	Coll.	Corvallis
Hooper, Maude	Meth.	Cottage Grove
Humason, Matilda	Coll.	Portland

Name.	Course.	Home Address.
Hurley, Alton	Coll.	Seattle, Wash.
Huston, Helen	Coll.	Corvallis
Imrie, Lillian Mildred	Coll.	Melrose
Jackson, Leona	Meth.	Monmouth
Jacobs, Cora	Coll.	Corvallis
Janes, Marjorie	Coll.	Portland
Johnson, Darrel De Los	Coll.	Corvallis
Johnson, Lillian	Coll.	Corvallis
Jordan, Melvin	Coll.	Corvallis
Johnson, Nicilina	Coll.	Los Angeles, Calif.
Jones, O. H.	Prep.	Irving
Kan, Frank Fan	Coll.	Canton, China
Keech, Edwin	Agri.	Stayton
Keiser, Lura	Meth.	Corvallis
Kennedy, Faith	Coll.	Salem
Kennedy, Ruby	Coll.	Salem
Kerr, Genevieve	Coll.	Corvallis
Kerr, Lynette	Coll.	Corvallis
Kleinwachter, Bertha	Meth.	Atlanta, Ga.
Knight, Florence	Coll.	Port San Louis, Calif.
Knutsen, Emma	Meth.	Astoria
Kaelewyn, Jacoba	Mus.	Dover, Ohio
Lane, Dorothy	Coll.	Corvallis
Lane, Robert	Coll.	Corvallis
Lantz, Charles	Meth.	Woodburn
Leweaux, Victor	Coll.	Corvallis
Lindgren, Anna	Meth.	Melrose
Lindsay, Alexander Lewis	Coll.	Hilo, Hawaii
Logan, Arthur Evan	Coll.	Escondido, Calif.
Lombard, Ruth Elaine	Meth.	Eugene
Long, Yick	Coll.	Canton, China
Lowe, H. H.	Coll.	McMinnville
McCulloch, Anna	Mus.	Gaston
McCullough, Elsie	Meth.	Gaston
McCullough, Ruth	Meth.	Gaston
McDonald, Arthur	Meth.	Salem
McFarlane, Mary Whiting	Coll.	Salem
McGuire, Ida	Meth.	Spokane
Markham, Arthur Gordon	Coll.	Corvallis
Marks, Mrs. Helen	Coll.	Portland
Martin, May Isabel	Prep.	Forest Grove
May, Grace	Coll.	Monkland
Meyers, Donald	Prep.	Salem
Miller, Eva	Coll.	Corvallis
Miller, Helen	Coll.	Corvallis
Moore, Genevieve	Coll.	Corvallis
Morse, Wilmetta	Coll.	Lafayette, Ind.
Newell, William Frederick	Meth.	Le Grand, Calif.
O'Connell, Laree	Coll.	Lincoln, Nebr.

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Name.	Course.	Home Address.
Orleman, Ada	Prep.	Sutherlin
Parcel, Albert	Coll.	Corvallis
Parpala, Taimie Armas.....	Coll.	Nasel, Wash.
Parr, Fern	Coll.	Woodburn
Peavy, Bradley	Agri.	Corvallis
Peeler, Leta	Prep.	Butte Falls
Persinger, Clanton	Coll.	Corvallis
Powers, Fred	Meth.	Oakland
Pratt, Laura Frances.....	Coll.	Corvallis
Prill, Alice	Coll.	Corvallis
Purvance, Ernest	Meth.	Cottage Grove
Quint, Alice	Meth.	Aloha
Ralston, Mabel	Coll.	Corvallis
Ramsdell, George James.....	Coll.	Portland
Raypholtz, Grace	Meth.	Medford
Ream, Rebecca	Meth.	Metzger, Wash.
Reed, Maurice	Coll.	Fresno, Calif
Ridenour, Elinor	Coll.	Corvallis
Rider, Benjamin	Agri.	Salem
Riley, George	Coll.	Menlo Park, Calif.
Robins, John	Agri.	Canby
Rodgers, Wentworth	Coll.	Anacortes, Wash.
Rose, Robert	Prep.	Cottage Grove
Russ, Edna Mae	Meth.	Corvallis
Russell, Atha	Agri.	Hillsboro
Rutledge, Anna	Coll.	Corvallis
Sant, W. S.	Coll.	Akola, India
Scott, Alvia	Meth.	Rogue River
Scott, Othor	Agri.	Lebanon
Seeley, Hazel	Meth.	Independence
Sexton, Ellen	Meth.	Pendleton
Sheridan, Rose	Meth.	Shedd
Sigman, Grace Maude	Coll.	Portland
Sigurdson, Runa	Mus.	Warrenton
Skelton, Mary	Coll.	Corvallis
Skipton, Lawrence	Coll.	Corvallis
Smith, Mrs. Grace	Mus.	Portland
Soderstrom, Victoria	Coll.	Halsey
Somers, Eugenia	Coll.	Corvallis
Spalding, Donald	Coll.	Corvallis
Stokes, Iva	Coll.	Eugene
Stout, Esther	Coll.	Oregon City
Strachan, Lexie	Meth.	Dufur
Stratton, Arletta	Meth.	Seattle, Wash.
Strue, Kathryn	Coll.	Medford
Sutherland, May	Coll.	Honolulu, Hawaii
Sweeney, Anna Grace	Coll.	Murphy
Taylor, Erna	Coll.	Faribault, Minn.
Thompson, Agnes	Coll.	Albany

Name.	Course.	Home Address.
Tong, Te	Coll.	Shanghai, China
Troedson, Elva	Meth.	Morgan
Troedson, Lillian	Coll.	Morgan
Turley, Mariam	Coll.	Corvallis
Underwood, Zetta	Coll.	Lebanon
Vedder, Harold Troxell	Meth.	Grants Pass
Walker, Eva	Coll.	Florence
Waldrip, Glenn Irwin	Meth.	Myrtle Creek
Weniger, Wanda	Coll.	Corvallis
Whitby, Harris	Coll.	Corvallis
White, Pauline	Meth.	Portland
Whitehill, Ellen	Meth.	Portland
Whitehouse, Earl	Coll.	Corvallis
Whitehouse, Walter	Coll.	Somerville, Mass.
Williams, Miriam	Coll.	Ft. Lauderdale, Fla.
Williamson, Charles Jacob	Coll.	Corvallis
Williamson, Martha	Coll.	Corvallis
Wilson, Mabel Effie	Coll.	Eugene
Wright, Ralph Van Fossen.....	Coll.	Butte Falls

SPECIAL MUSIC STUDENTS.

Name.	Course.	Home Address.
Appleman, Ruth Marguerite.....	Piano	Corvallis
Arbuthnot, Mrs. Hattie C.....	Piano	Corvallis
Bedynck, John Placidus	Violin	Corvallis
Belknap, Mrs. Inez	Voice	Corvallis
Blackburn, Emil Lloyd.....	Drums	Albany
Boies, Blanch	Violin	Corvallis
Briggs, Verne	Clarinet	Albany
Broders, Chester Ogburne.....	Piano	Corvallis
Buckingham, Lottie May.....	Piano	Blodgett
Burton, Mrs. Mabel	Voice	Corvallis
Caine, Grace Iva	Piano	Corvallis
Churchill, Mrs. Francis.....	Voice	Corvallis
Clark, Cathryn	Piano	Corvallis
Collens, Mrs. Hellier	Voice	Corvallis
Conley, Maurice	Clarinet	Corvallis
Cooper, Altha Opal	Voice	Corvallis
Corrie, Bernice	Piano	Corvallis
Corrie, Eva	Piano	Thorn, N. D.
Darling, Jessie Ruth	Piano	Corvallis
Davis, Norma	Piano	Corvallis
Eachus, Roy Milton	Voice	Alpine
Eaton, Helen	Piano	Independence
Edwards, Mrs. J. H.....	Voice	Corvallis
Fischer, Aleece	Piano	Corvallis
Gaton, Helen	Piano	Independence
Gerding, Lulie	Violin	Astoria
Glos, Karl Frederick	Saxophone	Corvallis
Graves, Mrs. Grace	Voice	Corvallis
Gray, Glenva	Violin	Corvallis
Grimm, Hazel	Voice	Corvallis
Hamlin, Louis Ward	Violin	Corvallis
Hamlin, Lucile Anna	Voice	Corvallis
Hardman, Eleanor	Piano	Corvallis
Hart, Ruth Genevieve	Violin	La Grande
Hyde, Sara Esther	Voice	Corvallis
Jones, Frieda Beryl	Piano	Corvallis
Kerr, Geneve	Violin	Corvallis
Kerr, Marion	Piano	Corvallis
Kerr, Moyt	Trombone	Corvallis
Kimberk, Irene	Voice	Monroe
Korschgen, Rolland	Voice	Corvallis
Lewis, Lucy	Voice	Corvallis
Lewis, Ruth Mary	Violin	Kalispel, Mont.
Lyon, Cora Ada	Voice	Corvallis
McIntosh, Harlan	Violin	Corvallis
Mixer, Vera	Piano	Albany

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Name.	Course.	Home Address.
Moore, Dorothy	Piano	Corvallis
Morgan, Maud	Piano	Corvallis
Moses, Everett	History	Corvallis
Norgren, Olga Otelia	Piano	Vancouver, Wn.
Oakes, Sylvia Alice	Piano	Portland
Osborne, James	Voice	Corvallis
Prather, Marie, Alma	Piano	Corvallis
Schubert, Placidus	Violin	Corvallis
Sheehan, Irene	Mandolin	Duluth, Minn.
Shriber, Earl	Violin	Corvallis
Skipton, Lawrence	Violin	Corvallis
Smith, Eleanor Carol	Piano	Corvallis
South, Esther	Voice	Juntura
Tucker, Mrs. Roy	Piano	Corvallis
Turley, Maud	Voice	Corvallis
Ueland, Cora Lorraine	Voice	Roseburg
Vance, Catherine	Voice	Corvallis
Von Lehe, Arthur	Violin	Corvallis
Von Toble, Mrs. Florence.....	Voice	Corvallis
Watson, Margaret	Piano	Corvallis
Waugh, Elma Elizabeth	Piano	Toledo
Welch, Litta Christine	Harmony	Corvallis
Willett, Marie Roseburg.....	Voice and Piano.....	Roseburg
Williams, Mrs. Richard.....	Voice	Corvallis
Williamson, Mary	Piano	Corvallis
Yates, Irma	Voice	Corvallis
Yates, Leata	Piano	Corvallis

WINTER SHORT COURSE STUDENTS.

Name.	Home Address.
Abraham, Miss Ida	Halsey
Abraham, W. W.	Halsey
Allingham, C. T.	Warm Springs
Anderson, J. A.	Medford
Annata, T. J.	Hood River
Atkinson, E.	Sand Lake
Atwood, J. R.	Chicago, Ill.
Atwood, Mrs. J. R.	Chicago, Ill.
Baker, W. G.	Corvallis
Baker, Mrs. W. G.	Corvallis
Bannard, Miss Edith	Grants Pass
Bartlett, W. F.	Portland
Barton, Miss Hazel	Salem
Beech, V. D. C.	Portland
Beals, Mrs. W. M.	Corvallis
Bell, J. H.	Medford
Black, Mrs. G. R.	Corvallis
Boney, M. M.	Eugene
Boies, I.	Corvallis
Bossen, H. S.	Langlois
Bosshart, J.	Warrenton
Bowman, Dr. S. A.	Salem
Bracker, Mrs. E. M.	Corvallis
Broer, F. E.	Salem
Brooks, A. G.	Jamieson
Brown, J. R.	Empire
Burnham, W. R.	Monroe
Burt, P. C.	Bend
Burt, Mrs. P. C.	Bend
Bartlett, W. F.	Portland
Campbell, Miss Nancy	Corvallis
Campbell, Miss Sarah	Oregon City
Canby, W. W.	Grants Pass
Card, Mrs. Mary E.	White Salmon, Wash.
Card, C. S.	White Salmon, Wash.
Carlton, F.	Shedd
Carstens, Miss Eva	Banks
Carstens, P.	Banks
Cartan, F. J.	Banks
Chaplain, W. W.	Corvallis
Clark, Mrs. H. B.	White Salmon, Wash.
Clark, H. B.	White Salmon, Wash.
Cleland, E. J.	Portland
Coburn, A. D.	Seattle, Wash.
Colvin, H. P.	Haines
Connor, Miss Dorothy	Medford

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Name.	Home Address.
Conklin, A.	Grants Pass
Conklin, Mrs. Bess	Grants Pass
Conner, Mrs. C. H.	Medford
Conner, Miss Evangeline	Corvallis
Conover, E. F.	Portland
Cook, T. L.	Quincy, Wash.
Cooter, Mrs. Arabel	Corvallis
Denniston, J. W.	McMinnville
Dicky, C. A.	Corvallis
Eagy, C. H.	Albany
Eastham, G.	Portland
Eberling, H.	Corvallis
Eldridge, E. G.	Alton, N. Y.
Evans, Miss Eva	Canby
Evans, L. R.	Mosier
Fautz, E.	Rock Spur
Feary, E. G.	Newberg
Forbes, G.	Portland
Forbes, Mrs. G.	Portland
Franklin, A. G.	Mill Town, Wash.
Fullenwider, G. H.	Portland
Gardner, Miss Callie	Corvallis
Gardner, Mrs. V. R.	Corvallis
Geary, H. L.	Seattle, Wash.
Gilbert, V. Z.	Corvallis
Gillinwater, C. C.	Hillsboro
Glines, Mrs. J. H.	Waldport
Glines, J. H.	Waldport
Goldsbury, J.	Parkdale
Graf, Miss Anna	Portland
Gravesson, G. C.	Coles Valley
Gray, Mrs. F. O.	Corvallis
Green, H. H.	Parkdale
Greene, Miss Pearle	Corvallis
Groenig, E. G.	Corvallis
Hammer, Miss Margaret	Lents
Hand, C. S.	Holler
Hauge, J. A.	Woodburn
Hanson, C. O.	Gardiner
Hanson, G. E.	Oregon City
Hansen, H. V.	Corvallis
Hansen, Mrs. Ruby	Oregon City
Harlan, L.	Corvallis
Harmon, R. C.	Corvallis
Harry, Mrs. T. F.	Corvallis
Harry, T. F.	Corvallis
Hawkins, H. F.	Salem
Hayden, Miss Jessie	Alsea
Henshall, H.	Goldfield, Nev.

Name.	Home Address.
Heyle, A. W.	Kansas City, Mo.
Hoerlein, Miss Gretchen	Hood River
Hoffard, A.	Woodburn
Hogan, E.	Corvallis
Holloway, Mrs. W. L.	Medford
Horner, Mrs. Isabelle	Corvallis
Hughes, R. J.	Butteville
Hughson, Mrs. J. D.	Corvallis
Hurd, G. L.	Stanfield
Irving, B.	Corvallis
Jamieson, J. A.	Portland
Jensen, O.	Glenburn, Calif.
Johnson, J.	Portland
Johnston, R. M.	Corvallis
Kafaury, A. A.	Turner
Kameto, R.	Gresham
Kennedy, C. M.	Corvallis
Kuppenbender, E.	Nehalem
Lamb, S. F.	Corvallis
Lankenau, W. H.	New York, N. Y.
Larsen, Miss Mabel	White Salmon, Wash.
Larsen, O.	Mt. Angel
Love, H. K.	Underwood, Wash.
Lury, C. R.	Portland
McBride, F.	Albany
McClaine, Miss Eleanor	Silverton
McDonald, L. A.	Corvallis
McHewen, D. S.	Corvallis
McMortensen, D.	Corvallis
McPherson, J. D., Jr.	Alpine
Mackenzie, J. C.	Corvallis
Mackenzie, R. S.	Clem
Marsh, L. D.	Aurora
Martinson, A.	Alsea
Mears, R. J.	Shedd
Melby, H.	Mt. Angel
Miller, A. J.	Hood River
Morse, S. H.	Corvallis
Morris, H. W.	Corvallis
Morgan, W. E., Jr.	Medford
Moore, R. G.	Underwood
Moore, R. A.	Elkton
Morris, D.	Corvallis
Morrison, M.	Williams
Moses, Rev. P. A.	Corvallis
Munson, C. W.	Medford
Myer, R.	Corvallis
Neal, Mrs. E. T.	Corvallis
Ollis, R. A.	Corvallis

Name.	Home Address.
Owens, Mrs. Elizabeth	Corvallis
Paeschke, E.	Junction City
Pamment, C.	Dufur
Patten, A. H.	Kelowna, B. C.
Patterson, S.	Medford
Patton, Mrs. Hamilton	Medford
Patton, Hami	Medford
Peterson, Mrs. Emelia	Corvallis
Peterson, E.	North Bend
Peterson, F. J.	Corvallis
Peterson, N. T.	North Bend
Philippi, A. R.	Early
Phillips, J. P.	Medford
Potter, Mrs. E. L.	Corvallis
Pratt, E. M.	Haines
Richey, G. H.	Gresham
Reimmer, E.	Talent
Rietmann, A.	Ione
Rohner, C. F.	Baker
Rohner, W. H.	Baker
Roseman, F. M.	Corvallis
Rosencrants, Mrs. Mabel	Corvallis
Rough, C. A.	Seattle, Wash.
Rueck, W.	Dairy
Ruth, Mrs. C. C.	Corvallis
Rutledge, Mrs. E. N.	Corvallis
Scarbrough, C.	Creswell
Schadwitz, M.	Corvallis
Schantin, T. M.	Gresham
Short, E. R.	Wilbur
Sinke, C. M.	Corvallis
Shelton, A. L.	Pomeroy, Wash.
Smith, Mrs. M. E. H.	Corvallis
Stegerwald, A.	Corvallis
Stevenson, A. L.	Corvallis
Stevenson, Mrs. Ola	Corvallis
Stimson, H. C.	Corvallis
Stockton, R. V.	Sheridan
Stowell, Dr. A. P.	Corvallis
Stretch, W. R.	Dayton
Sullivan, L. E.	Hermiston
Swanson, A. P.	Portland
Talcott, A. F.	Caldwell, Ida.
Tapscott, W. R.	Dallas
Tartar, Mrs. N.	Corvallis
Thomas, V.	Anlauf
Tidd, C. W.	Corvallis
Tillery, G. C.	Ballston
Tillery, G. S.	Medford

Name.	Home Address.
Valentine, C.	Montesano, Wash.
Vischer, L.	Ione
Vogel, A.	Gresham
Wagenschien, O. E.	Eugene
Waldrip, Mrs. Jessie	East Sound, Wash.
Walker, Mrs. Effie	Corvallis
Walker, E. H.	Corvallis
Welt, Mrs. Ellen	Corvallis
Webb, Miss Lillie	Portland
Wedel, Miss Mary	Aberdeen, Wash.
Weinert, S.	Portland
Wells, Mrs. J. P.	Jacksonville
Wells, J. W.	Imbler
Wheeler, W. W.	Corvallis
Whitmore, R. M.	Corvallis
Williams, J. H.	Hermiston
Wilson, F.	Cloverdale
Wilson, J. O.	Corvallis
Wilson, Mrs. Lily	Portland
Wittenberg, M.	Portland
Witter, G. H.	Kent
Woodcock, M. S.	Corvallis
Workinger, F.	Shedd
Wright, Mrs. L. N.	Corvallis
Yates, Miss Laura	Salem
Yates, W. M.	Corvallis
Young, F. A.	La Grande

NOTE.—In addition to the above listed names, out of a total of 2671 students registered in the Farmers' Week and in the special Domestic Art courses, the names of 2119 students who were registered in these courses, but in no other College courses, do not appear.

HONOR STUDENTS.

Honor students, at graduation, are selected on a basis of pre-eminence in both class work and student activities. All courses are represented by honor students, the representation being on the basis of one honor student to every ten seniors in each degree course. No student, however, will be named in the honor list whose merit grade is below seventy-five. The selection is made jointly by faculty and students.

Selection for June, 1914.

IN AGRICULTURE

Charles Lester Hill	Albert Freeman Mason
D. C. Howard	Francis Edwards Neer
Frank Walter Kehrl	Ralph Merrill Rutledge

IN DOMESTIC SCIENCE AND ART

Alice Rosamond Butler	Lillian Thordarson
Esther Ruby Smith	Mildred Marie Wilson
Cordelia Hawley Goffe	

IN ENGINEERING

Civil Engineering—Henry Odeen
Electrical Engineering—Victor Eugene Weber
Mechanical Engineering—Virgil Arthur Rawson
Mining Engineering—Thomas Alfred Rice

IN FORESTRY

Lynn Foster Cronemiller

IN COMMERCE

Russell Marion Howard

IN PHARMACY

Rose Coffman Mason

IN MUSIC

Lena Belle Tartar

CLARA H. WALDO PRIZES.

The Clara H. Waldo Prizes are awarded on a basis of both scholarship and general achievement as follows: (a) Proficiency in literary and scholastic attainments; (b) Success in student activities; (c) Qualities of womanhood; (d) Qualities of leadership. The selection is made by a joint arrangement between faculty and students. To the senior woman selected, a prize of forty dollars is awarded; to the junior woman, thirty dollars; to the sophomore woman, twenty dollars; and to the freshman woman, ten dollars. Students receiving second and third place in each class are given Honorable Mention.

Selection for June, 1914.

SENIOR
Lillian Thordarson

SOPHOMORE
Della Jackson

JUNIOR
Abbie Coon

FRESHMAN
Lorna Callamore

The students in each class receiving second and third place, entitling them to Honorable Mention, are:

SENIORS
Mildred Wilson
Lottie Milam

SOPHOMORES
Geraldine Newins
Helen Horning

JUNIORS
Inez Bozorth
Kareen Hansen

FRESHMEN
Marion Mateer
Eva Keatley

FORENSIC HONOR ROLL.

INTERCOLLEGIATE ORATOR

F. J. Dietsch

INTERCOLLEGIATE PEACE ORATOR

Z. A. Lansdale

INTERCOLLEGIATE DEBATERS

E. H. Reichart

G. R. Hoerner

H. M. Currey

H. W. Russell

R. R. Reichart

V. J. Gavin

E. J. Fraley, Alternate.

*CHAMPION INTERCLASS ORATOR

Nao Uyei, Sophomore. (1913-14)

*CHAMPION INTERCLASS DECLAMATION

Evelyn Spencer, Senior. (1913-14)

CHAMPIONS IN INTERCLASS DEBATE

E. Englund

A. O. Leech

T. J. Lowe

Freshmen

WINNER OF SHAKOPEAN CUP

Awarded annually to the member of the senior class
having the best record in forensics for
the whole College course.

H. M. Currey

*These contests were held too late to announce this year's winners.

SUMMARIES.*

CLASSIFIED AS TO COURSE

(All Duplicates Excluded)

Course	Men	Women	Total
Agriculture	540	7	547
Forestry	83		83
Home Economics		371	371
Engineering and Industrial Arts.....	297		297
Commerce	116	54	170
Pharmacy	54	7	61
Optional	6	21	27
Music	16	57	73
Summer School	75	133	208
Winter Short Courses	1405	934	2339
Total.....	2592	1584	4176

*The enrollment statistics include those only who have pursued work at the College; correspondence students are omitted.

CLASSIFIED AS TO RESIDENCE.

(All Duplicates Excluded)

States and Territories:

Oregon		3633
Alaska	4	
Arizona	2	
California	143	
Colorado	10	
Connecticut	2	
Florida	2	
Georgia	1	
Idaho	41	
Illinois	17	
Indiana	12	
Iowa	6	
Kansas	10	
Kentucky	4	
Maryland	1	
Massachusetts	9	
Michigan	3	
Minnesota	8	
Mississippi	1	
Missouri	2	
Montana	10	
Nebraska	5	
Nevada	1	
New Hampshire	1	
New Jersey	1	
New Mexico	2	
New York	13	
North Dakota	7	
Ohio	7	
Oklahoma	5	
Pennsylvania	5	
South Dakota	1	
Texas	4	
Utah	2	
Vermont	3	
Virginia	2	
Washington	133	
Washington, D. C.	1	
Wisconsin	3	
Wyoming	2	486

Foreign Countries:

Canada	20	
China	4	
Denmark	3	
England	1	
Greece	1	
Hawaii	8	
Holland	1	
India	5	
Ireland	1	
Japan	9	
Philippine Islands	2	
Porto Rico	1	
Russia	1	57
<hr/>		
Net total		4176

COMPARATIVE ENROLLMENT.

1888-1889	97
1889-1890	151
1890-1891	201
1891-1892	208
1892-1893	282
1893-1894	240
1894-1895	261
1895-1896	397
1896-1897	316
1897-1898	336
1898-1899	338
1899-1900	405
1900-1901	436
1901-1902	448
1902-1903	541
1903-1904	530
1904-1905	680
1905-1906	735
1906-1907	833
1907-1908	1156
1908-1909	1352
1909-1910	1591
1910-1911	1778
1911-1912	2868
1912-1913	2314
1913-1914	2435
1914-1915	4176

The great difference in the total enrollment for the two years, 1910-11 and 1911-12, was due largely to the increase in the number of students registered for the winter short courses in Agriculture. The increase in the number of regular students in the 36-weeks courses was 24 per cent.

The decrease in the number of students in 1912-13 from the year 1911-12 is due to the decrease in the short course registration. The increase in the number of regular students in the 36-weeks courses was 19 per cent.

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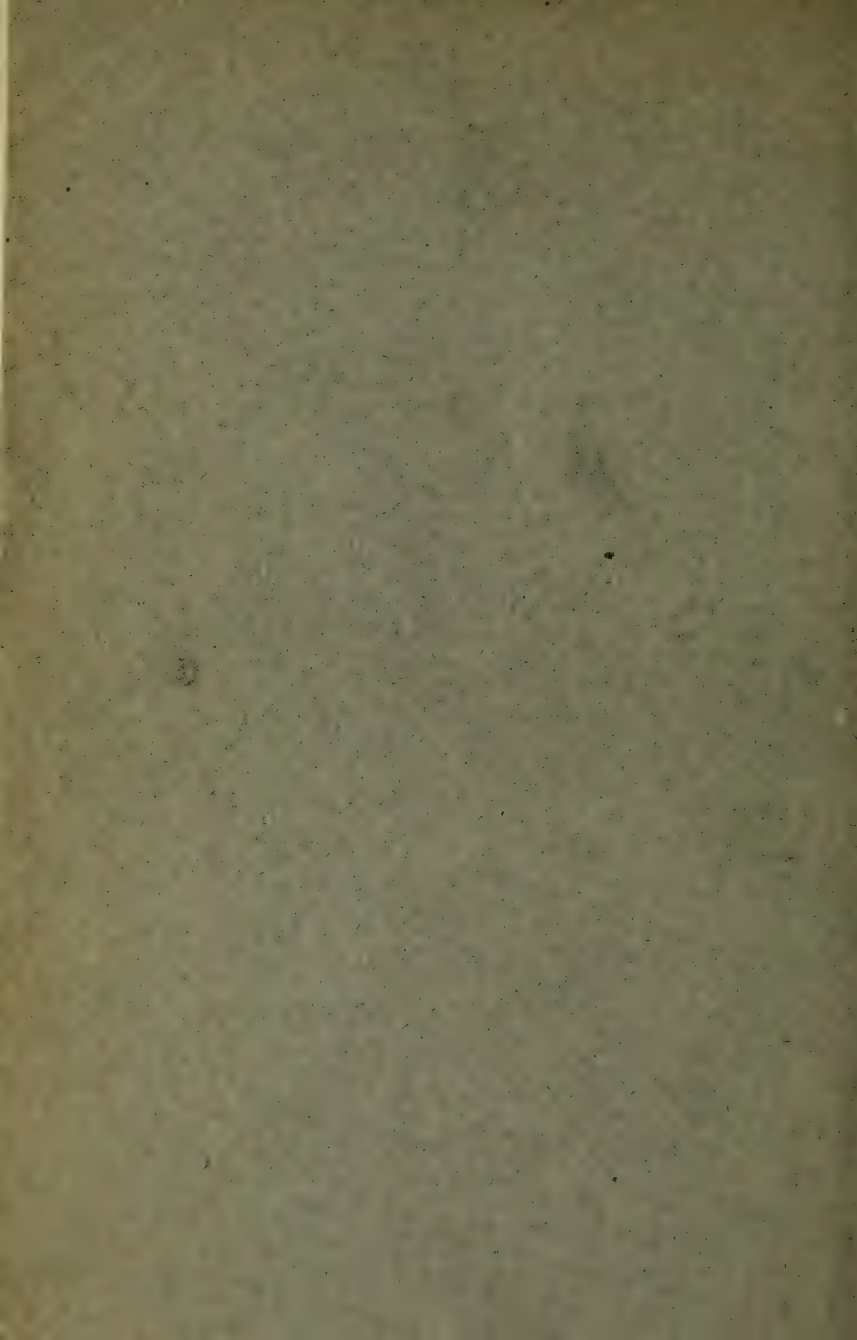
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Annual Catalogue 1916-17

WITH LIST OF STUDENTS FOR 1915-16

CORVALLIS, OREGON



CATALOGUE
OF THE
Oregon Agricultural College
FOR
1916-17

WITH LIST OF STUDENTS FOR 1915-16



CORVALLIS, OREGON

MAY 15, 1916

CORVALLIS
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COLLEGE CALENDAR, 1916-17

1916.

September 18, 19, Monday, Tuesday—Registration and examinations for admission.

September 20, Wednesday—Recitations begin.

October 6, Friday—Quarterly meeting of the Board of Regents.

November 6, Monday—Forestry Short Course begins.

November 29, 30, December 1, 2, Wednesday (noon), Thursday, Friday, Saturday—Thanksgiving recess.

December 23, Saturday (noon)—Christmas recess begins.

1917

Jan 1 - 6, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday—Farmers' and Home Makers' Week and Rural Life Conferences.

January 3, Wednesday—Quarterly meeting of the Board of Regents.

January 8, Monday—Regular exercises resumed. Winter Short course begins.

January 27, 29, 30, 31, Saturday, Monday, Tuesday, Wednesday—First semester examinations.

February 2, Friday—Winter short course ends.

February 1, 2, 3, Thursday, Friday, Saturday—Mid-year vacation.

February 5, 6, Monday, Tuesday—Second semester registration.

February 7, Wednesday—Recitations begin.

February 22, Tuesday—Washington's birthday; a legal holiday.

April 4, Wednesday—Quarterly meeting of Board of Regents.

April 13, Friday—Forestry short course ends.

May ————— Military inspection day.

May 30, Wednesday—Decoration Day; a legal holiday.

June 3, Sunday—Baccalaureate sermon.

June 4, Monday—Senior Class Day exercises.

June 5, Tuesday—Commencement exercises.

Final examinations for the second semester will be held on Tuesday afternoon, June 5; Wednesday, June 6; Thursday, June 7; and Friday, June 8.

June 11, Monday—Summer session begins.

July 21, Saturday—Summer session closes.

BOARD OF REGENTS

OFFICERS

HON. J. K. WEATHERFORD, President.....	Albany
HON. N. R. MOORE, Secretary.....	Corvallis
HON. C. L. HAWLEY, Treasurer.....	McCoy

EX-OFFICIO MEMBERS

HON. JAMES WITHYCOMBE, Governor of the State.....	Salem
HON. BEN W. OLCOTT, Secretary of State.....	Salem
HON. J. A. CHURCHILL, Supt. of Public Instruction.....	Salem
HON. CHARLES E. SPENCE, Master of State Grange.....	Oregon City

APPOINTED BY THE GOVERNOR

	Term Expires
HON. J. T. APPERSON.....	Parkplace, 1918
HON. J. K. WEATHERFORD.....	Albany, 1918
HON. C. L. HAWLEY.....	McCoy, 1918
HON. WALTER M. PIERCE.....	La Grande, 1921
HON. H. VON DER HELLEN.....	Wellen, 1921
HON. GEO. M. CORNWALL.....	Portland, 1921
HON. CLARA H. WALDO.....	Portland, 1924
HON. N. R. MOORE.....	Corvallis, 1924
HON. JEFFERSON MYERS.....	Portland, 1924

STANDING COMMITTEES

EXECUTIVE COMMITTEE

J. K. Weatherford, Chairman; J. T. Apperson, C. E. Spence, W. M. Pierce, J. Myers.

FINANCE COMMITTEE

J. T. Apperson, Chairman; W. M. Pierce, C. L. Hawley.

COLLEGE COMMITTEE

J. A. Churchill, Chairman; W. M. Pierce, N. R. Moore.

STATION COMMITTEE

W. M. Pierce, Chairman; H. Von der Hellen, C. E. Spence.

FORESTRY

Geo. M. Cornwall, Chairman; Ben W. Olcott, J. Myers.

EXTENSION COMMITTEE

J. Myers, Chairman; C. L. Hawley, C. E. Spence, H. Von der Hellen.

OFFICERS OF ADMINISTRATION AND INSTRUCTION

(Arranged in groups in the order of seniority of appointment)

ADMINISTRATIVE COUNCIL

WILLIAM JASPER KERR, D. Sc.,
President.

ARTHUR BURTON CORDLEY, M. S.,
Dean of the School of Agriculture; Director of the Agricultural
Experiment Station.

GRANT ADELBERT COVELL, M. E.,
Dean of the School of Engineering and Mechanic Arts; Professor
of Mechanical Engineering.

JOHN ANDREW BEXELL, A. M.,
Dean of the School of Commerce; Professor of Business
Administration.

EDWIN DEVORE RESSLER, A. M.,
Director of the Summer School; Professor of Industrial Education.

RALPH DORN HETZEL, A. B., LL. B.,
Director of Extension Service.

HENRY MARTIN PARKS, B. S., E. M.,
Dean of the School of Mines.

GEORGE WILCOX PEAVY, M. S. F.,
Dean of the School of Forestry.

MARY ELIZA FAWCETT, A. M.,
Dean of Women; Chairman Executive Committee School of
Home Economics.

COLLEGE COUNCIL*

FREDERICK BERCHTOLD, A. M.,
Professor of the English Language and Literature.

JOHN B. HORNER, A. M., Litt. D.,
Professor of History.

GORDON VERNON SKELTON, C. E.,
Professor of Civil and Highway Engineering.

JOHN FULTON, M. S.,
Professor of General and Analytical Chemistry.

CLAUDE ISAAC LEWIS, M. S. A.
Professor of Horticulture; Vice-Director and Chief in Horticulture,
Experiment Station.

CHARLES LESLIE JOHNSON, B. S.,
Professor of Mathematics.

JAMES DRYDEN,
Professor of Poultry Husbandry; Chief in Poultry Husbandry,
Experiment Station.

HENRY DESBOROUGH SCUDDER, B. S.,
Professor of Soils and Farm Management; Chief in Soils and Farm
Management, Experiment Station.

WILLIAM FREDERIC GASKINS, B. S.,
Professor of Music.

WILLIAM ARTHUR JENSEN,
Executive Secretary.

FARLEY DOTY McLOUTH, B. S.,
Professor of Art.

LOUIS BACH, M. A.,
Professor of Modern Languages.

* The College Council is composed of members of the Administrative Council and other members of the staff with the rank of professor, associate professor, or assistant professor.

OREGON AGRICULTURAL COLLEGE

IDA ANGELINE KIDDER, A. B., B. L. S.,
Librarian.

ERMINE LAWRENCE POTTER, B. S.,
Professor of Animal Husbandry; Chief in Animal Husbandry,
Experiment Station.

THEODORE DAY BECKWITH, M. S.,
Professor of Bacteriology; Chief in Bacteriology, Experiment
Station.

HELEN BRYCE BROOKS,
Professor of Domestic Art.

MIRIAM THAYER SEELEY, A. B.,
Professor of Physical Education for Women.

HECTOR MACPHERSON, Ph. D.,
Professor of Economics; Director of the Bureau of Organization
and Markets.

ULYSSES GRANT DUBACH, Ph. D.,
Professor of Political Science.

ROY RALPH GRAVES, M. S.,
Professor of Dairy Husbandry; Chief in Dairy Husbandry,
Experiment Station.

IRA ABRAHAM WILLIAMS, M. S., A. M.,
Professor of Ceramic Engineering

HENRY CLAY BRANDON, A. M.,
Professor of Industrial Arts; Director of Shops.

RICHARD HAROLD DEARBORN, M. E.,
Professor of Electrical Engineering.

GEORGE FRANCIS SYKES, A. M.,
Professor of Zoology and Physiology.

BENNETT THOMAS SIMMS, D. V. M.,
Professor of Veterinary Medicine; Chief in Veterinary Medicine,
Experiment Station.

THOMAS ANDERSON HENDRICKS TEETER, B. S.,
Professor of Irrigation Engineering.

SAMUEL HERMAN GRAF, M. S.,
Professor of Experimental Engineering.

ADOLPH ZIEFLE, B. S., Ph. C.,
Professor of Pharmacy.

WILLIAM BALLANTYNE ANDERSON, Ph. D.,
Professor of Physics.

AVA BERTHA MILAM, Ph. B., A. M.,
Professor of Domestic Science.

VICTOR RAY GARDNER, M. S.,
Professor of Pomology; Pomologist, Experiment Station.

EDWARD MICHAEL DUFFY,
Manager of Business Office.

HAROLD MANLEY TENNANT,
Registrar.

ULYSSES GRANT McALEXANDER, Major U. S. A.,
Professor of Military Science and Tactics; Commandant of Cadets.

HOWARD PHILLIPS BARSS, A. B., M. S.,
Professor of Botany and Plant Pathology; Chief in Botany and
Plant Pathology, Experiment Station.

WILLIAM HAWES COGHILL, E. M.,
Professor of Mining and Metallurgy.

PAUL VESTAL MARIS, B. S.,
State Leader County Agriculturists, Extension Service.

EZRA JACOB KRAUS, B. S.,*
Professor of Research in Horticulture, Experiment Station.

* On leave of absence.

GEORGE ROBERT HYSLOP, B. S.,
Professor of Farm Crops; Chief in Farm Crops, Experiment Station.

WILBUR LOUIS POWERS, M. S.,
Professor of Irrigation and Drainage; Chief in Irrigation and
Drainage, Experiment Station.

ALFRED D. BROWNE, M. D.,
Director of Physical Education.

JOSEPH AMOS PIPAL,
Professor of Physical Education.

MARK CLYDE PHILLIPS, B. M. E.,
Associate Professor of Mechanical Engineering; Superintendent of
Heating.

ARTHUR LEE PECK, B. S.,
Associate Professor of Landscape Gardening and Floriculture;
Superintendent of Campus and Greenhouses.

EDWIN THOMAS REED, B. S., A. B.,
College Editor.

HERMAN VANCE TARTAR, B. S.*
Associate Professor of Agricultural Chemistry; Chief in Chemistry,
Experiment Station.

RENTON KIRKWOOD BRODIE, M. S.,
Associate Professor of General Chemistry.

HAROLD STEPHENSON NEWINS, Ph. B., M. F.,
Associate Professor of Forestry

ELMER JAY BROWN, Ph. D.,
Associate Professor of Economics.

WINFRED McKENZIE ATWOOD, Ph. D.,
Associate Professor of Botany.

EDWARD BENJAMIN BEATY, B. S., M. A.
Associate Professor of Mathematics.

* On leave of absence.

IDA BURNETT CALLAHAN, B. S.,
Associate Professor of English Language and Literature.

LESTER LOVETT, B. S.,
Associate Professor of Entomology; Chief in Entomology,
Experiment Station.

NICHOLAS TARTAR, B. S.,
Assistant Professor of Mathematics.

ARTHUR GEORGE BOUQUET, B. S.,
Assistant Professor of Vegetable Gardening; Vegetable Gardening
Specialist, Experiment Station.

MILO REASON DAUGHTERS, A. M.,
Assistant Professor of Organic Chemistry.

OTTO GERALD SIMPSON, B. S.,
Assistant Professor of Dairy Manufacturing; Dairy Manufacturing
Specialist, Experiment Station.

EDWARD BLODGETT FITTS,
Assistant Professor of Dairy and Animal Husbandry,
Extension Service.

WALTER SHELDON BROWN, A. B., M. S.,
Assistant Professor of Horticulture and Crop Pests,
Extension Service.

JOHN ELMER LARSON, B. S.,
Assistant Professor of Agronomy, Extension Service.

RALPH ELMER REYNOLDS, M. S.,
Assistant Professor of Animal Husbandry, Extension Service.

REX EARL EDGECOMB, B. S.,
Assistant Professor of Civil Engineering.

FAY HARRY ROSENCRANTS, B. S.,
Assistant Professor of Mechanical Engineering.

SIGURD HARLAN PETERSON, B. A.,
Assistant Professor of English.

CARL NELSON KENNEDY, B. S.,
Assistant Professor of Animal Husbandry; Secretary Stallion
Registration Board.

FRANK HENRY SHEPHERD, A. M.,
Assistant Professor of Industrial Education.

CHARLES VLADIS RUZEK, B. S. A.,
Assistant Professor of Soils; Assistant in Soils, Experiment
Station.

LAWRENCE FISHER WOOSTER, B. S.,
Assistant Professor of Electrical Engineering; Superintendent
of Light and Power.

WILLIAM ALFRED BEVAN, B. S.,
Assistant Professor of Physics.

GODFREY VERNON COPSON, M. S.,
Assistant Professor of Bacteriology.

WILLIAM EVANS LAWRENCE, B. S.,
Assistant Professor of Botany.

SARAH LOUISE LEWIS,
Assistant Professor of Domestic Science.

CHESTER COLLINS MAXEY, M. A.,
Assistant Professor of Political Science.

ALICE MARKS DOLMAN, M. S.,
Assistant Professor of Household Administration.

BERT WALTER HARRIS, B. Com. Sc.,*
Assistant Professor of Office Training and Stenography.

* On leave of absence.

WILLIAM JAMES GILMORE, B. S. A. E.,
Assistant Professor of Farm Mechanics.

WILLIS ARCHER BARR, B. S.,
Field Dairyman, Extension Service.

MERRILL OSGOOD EVANS, B. S.,
Assistant State Leader of County Agriculturists,
Extension Service.

HELEN JULIA COWGILL, B. S.,
Assistant State Leader of Industrial Clubs, Extension Service.

BERT PILKINGTON, B. S.,
Assistant in Chemistry, Experiment Station.

HARRY CASE SEYMOUR,
State Leader Industrial Clubs, Extension Service

ANNA MAE TURLEY, B. S.,
Assistant Professor of Home Economics, Extension Service.

JAMES GEORGE ARBUTHNOT, B. S.,
Assistant Professor of Physical Education.

GEORGE ROY SAMSON, B. S., A. B.,
Assistant Professor of Animal Husbandry; Assistant in Animal
Husbandry, Experiment Station.

GEORGE EDWARD GOODSPEED, Jr., B. S.
Assistant Professor of Geology .

RAYMOND ADAMS DUTCHER, M. S., A. M.,
Assistant Professor of Agricultural Chemistry

LAWRENCE EUGENE ROBINSON, B. S.,
Assistant Professor of Rural Architecture.

OREGON AGRICULTURAL COLLEGE

HERBERT TOWNSEND VANCE,
Assistant Professor of Office Training.

LUCY MAY LEWIS, A. B., B. L. S.,
Assistant Librarian.

WENDELL J. PHILLIPS, M. D.,
Medical Adviser.

INSTRUCTORS AND ASSISTANTS

HARRY LYNDEN BEARD, B. S.,
Instructor in Mathematics; Director of Cadet Band.

LOREN BURTON BALDWIN, A. M.,
Instructor in English

WILLIAM McCAULLY PORTER,
Instructor in Forging.

CARL LAFAYETTE KNOFF, M. E.,
Instructor in Experimental Engineering.

GENEVIEVE BAUM-GASKINS,
Instructor in Pipe Organ and Piano.

GERTRUDE EWING McELFRESH, A. B.,
Instructor in English

ALICE LEORA EDWARDS, B. S.,*
Instructor in Zoology and Physiology.

MAY BABBITT-RESSLER,
Instructor in Piano.

SAMUEL MICHAEL PATRICK DOLAN, C. E.,
Instructor in Civil Engineering.

AMBROSE ELLIOTT RIDENOUR, B. S.,
Instructor in Foundry Practice.

CHARLES GEORGE WILTSHIRE,
Instructor in Plumbing and Steam Fitting.

CHARLES ELMER OWENS, M. A.,
Instructor in Botany.

ERWIN BERTRAN LEMON, B. S.,
Instructor in Commerce.

* On leave of absence.

OREGON AGRICULTURAL COLLEGE

JOSEPH BENJAMIN YODER, B. S.,
Instructor in Mechanical Drawing.

GILBERT BRUCE BLAIR, A. M.,
Instructor in Physics.

CHARLES CHAUNCEY LAMB, B. S.,
Instructor in Poultry Husbandry, Extension Service.

REGINALD HEBER ROBINSON, M. S.,
Assistant in Chemistry, Experiment Station.

DARWIN GREENE THAYER, B. S.,
Instructor in Woodworking.

CHARLES JARVIS McINTOSH, B. S.,
Instructor in News Writing; Editor of Press Bulletins.

JOHN HARRISON BELKNAP, B. S.,
Instructor in Physics.

BARABRA MOORE, B. S.,
Instructor in Domestic Art.

GRACE CHRISTINE ROSAAEN,
Instructor in English

ASA CHANDLER, Ph. D.,
Instructor in Zoology and Physiology.

CHARLES JUNIUS CONOVER, M. S.,
Instructor in Forestry.

JOHN EDWARD COOTER, B. S.,
Instructor in Soils.

HELEN PEER,
Instructor in Domestic Art.

CHARLOTTE LEWIS NELSON,
Instructor in Physical Education for Women.

RUSSELL MARION HOWARD, B. S.,
Instructor in Accounting and Economics.

CHRISTIE MOORE, B. S.,*
Instructor in Domestic Science.

CORINNE BLOUNT, B. M.,
Instructor in Piano.

EDWARD HELLIER-COLLENS,
Instructor in Stringed Instruments; Director of College Orchestra.

RAY BOALS, B. S.,*
Instructor in Experimental Engineering.

LILLIAN MABEL GEORGE,
Cataloguer in Library.

IRVINE HILL BLAKE, A. M.,
Instructor in Zoology and Physiology.

ORAN MILTON NELSON, B. S.,
Instructor in Animal Husbandry; Assistant in Animal Husbandry,
Experiment Station.

MILTON JOHN SEELEY, Ph. C.,
Instructor in Chemistry.

EDNA MAY FLARIDA,
Instructor in Art.

BERTHA DAVIS, M. S.,
Instructor in Domestic Science.

DEXTER RALPH SMITH, B. S.,
Instructor in Civil Engineering.

CORA ELIZABETH PLATT
Instructor in Domestic Art.

* On leave of absence.

OREGON AGRICULTURAL COLLEGE

WILLIS DHU AINE PEASLEE, E. E.,
Instructor in Electrical Engineering.

RALPH MADISON PAVEY, B. S. C.,
Instructor in Physical Education for Men.

WALTER FRANKLIN MADDISON,
Instructor in Machine Shop.

RALPH McBURNEY, B. S.,
Instructor in Bacteriology.

ROBERT ANDREW DUNCAN, A. B., A. M.,
Instructor in Chemistry.

D. C. HOWARD, B. S.,
Instructor in Dairy Husbandry.

HOWARD SPURR HAMMOND, A. B., M. A.,
Instructor in Botany.

ALDEN FORREST BARSS, M. S.,
Instructor in Horticulture; Assistant in Horticulture, Experiment
Station.

RALPH FINNEY BEARD, B. S.,
Instructor in Chemistry; Assistant in Chemistry,
Experiment Station.

FRANK WALTER KEHRLI, B. S.,
Field Dairyman, Extension Service.

ETHA MABEL MAGINNIS,
Instructor in Stenography.

ALMA GRACE JOHNSON, B. S.,
Instructor in Domestic Science.

MELISSA MARGARET MARTIN,
Instructor in Modern Languages.

JUNE SEELEY, B. S.,
Instructor in Domestic Art.

LILLIAN FRANCIS, B. S.,
Instructor in Domestic Science; Secretary Y. W. C. A.

FRED MERLE MILLER, B. S.,
Instructor in Experimental Engineering.

IRWIN LEONARD BETZEL, B. S.,
Instructor in Pharmacy.

LAURA CHENEY, B. S.,
Instructor in Domestic Science.

GRACE PATTON GILLETT, B. S.,
Instructor in Domestic Art.

ANNA CASTLEBERRY,
Instructor in Domestic Art

ARTHUR CLIFFORD McCULLOCH, B. S. A.,
Instructor in Poultry Husbandry.

ROY EDGAR MARSHALL, M. S.,
Instructor in Horticulture.

NEWELL HOWLAND COMISH, M. S.,
Instructor in Economics.

IRENE TELFORD,
Instructor in Physical Education for Women

BERTHA GERALDINE BOLES,
Instructor in Physical Education for Women.

SYLVESTER BOYER, A. B.,
Instructor in Chemistry.

GEORGE ELWIN STOWELL, B. S.,
Instructor in Mining.

OREGON AGRICULTURAL COLLEGE

EDITH FREEMAN SHERMAN,
Instructor in Art.

WILLARD JOSEPH CHAMBERLAIN, B. S.,
Instructor in Entomology. Assistant in Entomology,
Experiment Station.

MARION BERTICE McKAY, M. S.,
Assistant in Botany and Plant Pathology, Experiment Station.

PAUL STANLEY LUCAS, B. S. A.,
Instructor in Dairy Manufactures.

CHARLOTTE NEVIL HURD, A. M.,
Instructor in Zoology.

JESSE FRANKLIN BRUMBAUGH, A. M., LL. B.,
Instructor in Psychology.

MINNIE KALBUS, B. S.,
Instructor in Domestic Science.

RACHEL WEBB HAIGHT,
Assistant in Library.

BERTHA HERSE, B. S.*
Assistant in Library.

CYRUS FRANKLIN DUGGER,
Assistant in Military Science.

BERT THEW JORDAN, B. S.,
Assistant in Chemistry.

LILA GRACE DOBELL, B. S.,
Assistant in Library.

GUILFORD LANSING HURD,
Field Organizer, Bureau of Organization and Markets.

* On leave of absence.

JOHN ROBERT MAGNESS, M. S.,
Assistant in Horticulture, Experiment Station.

GEORGE FRANKLIN MOZNETTE, B. S.,
Assistant in Entomology, Experiment Station.

DENIS HAYES,
Assistant in Military Science.

HENRY ODEEN, B. S.,
Assistant in Experimental Engineering.

HARRY AUGUST SCHOTH, M. S.,
Assistant in Farm Crops, Experiment Station.

HOWARD MARSHALL WIGHT, B. S.,
Teaching Fellow in Zoology.

HENRY CLARK GILBERT, B. S.,
Teaching Fellow in Botany.

OTTO HERMAN ELMER, B. S.,
Fellow in Plant Pathology, Experiment Station.

SAMUEL KILBOURN WHITE, Jr., B. S.,
Teaching Fellow in Horticulture.

LEON HAWKINS, B. S.,
Laboratory Assistant; Foreman College Orchards.

EDGAR MONTELL, B. S.,
Laboratory Assistant; Foreman Experiment Station Orchards.

OREGON AGRICULTURAL COLLEGE

COUNTY AGRICULTURISTS

HAROLD ROLAND GLAISYER, B. S.,
Klamath County.

ROY CLAUDE JONES, B. S.,
Tillamook County.

JAY LATTIMER SMITH, B. S.,
Coos County.

AMOS EDWIN LOVETT, B. S.,
Crook County.

WALTER WILLIAM HOWARD, B. S.,
Malheur County.

CLAUDE CLIFTON CATE, B. S.,
Jackson County.

ORLANDO HARDY, B. S.,
Lake County.

SYLVESTER BENJAMIN HALL, B. S.,
Multnomah County.

MANNES SEYMOUR SHROCK,
Yamhill County.

ARTHUR CHASE, B. S.,
Wasco County.

PAUL HERMAN SPILLMAN, B. S.,
Union County.

CHARLES THOMPSON, M. S.,
Josephine County.

NEWELL ROBB, B. S.,
Lane County.

CLARENCE LLOYD JAMISON, B. S.,
Wheeler County.

OTHER OFFICERS

ELMER POLIC JACKSON, B. S.,
Superintendent of Buildings.

SIBYLLA HADWEN,
Housekeeper Women's Dormitories, Preceptress of Waldo Hall.

CHARLES LEWIS PARRISH,
Auditor.

KATHERINE BARBARA HAIGHT,
Preceptress of Cauthorn Hall.

HELEN LUCILE HOLGATE, B. S.,
In Charge of College Exchange.

NORMA WADDLE, B. S.,
Assistant in Seed Testing Laboratory.

DAVID MASTERTON,
Foreman Campus and Greenhouses.

FRANK HARRISON CASE,
Foreman College Print Shop.

INEZ VALENTIA BOZORTH, B. S.,
Secretary School of Home Economics.

CLYTIE MAY WORKINGER,
Secretary to Director of Experiment Station.

HAZLITT VICKERS,
Secretary Extension Service.

JOHN HOWARD PAINE, B. S.,
Foreman Poultry Plant.

DALE EVERETT RICHARDS, B. S.,
Acting Farm Superintendent.

JOSEPH HOLT EDWARDS,
ELLSWORTH ERWIN,
Janitorial Superintendents.

SUPERINTENDENTS OF BRANCH EXPERIMENT STATIONS

EASTERN OREGON BRANCH EXPERIMENT STATION

Robert Withycombe, B. S.,
Union.

UMATILLA BRANCH EXPERIMENT STATION

Ralph Wilmer Allen, B. S.,
Hermiston.

EASTERN OREGON DRY-FARM BRANCH EXPERIMENT
STATION

David Edmund Stephens, B. S.,
Moro.

SOUTHERN OREGON BRANCH EXPERIMENT STATION

Frank Charles Reimer, M. S.,
Talent.

HARNEY VALLEY BRANCH EXPERIMENT STATION

Leroy Breithaupt, B. S.,
Burns.

JOHN JACOB ASTOR BRANCH EXPERIMENT STATION

Glen Howard Roberts, B. S.,
Astoria.

HOOD RIVER BRANCH EXPERIMENT STATION

Le Roy Childs, A. B.,
Entomologist, Experiment Station.
Gordon George Brown, B. S.,
Horticulturist, Experiment Station.
Hood River.

GENERAL INFORMATION

FOUNDATION AND ENDOWMENT

In pursuance of an Act of Congress, approved by President Lincoln, July 2, 1862, a grant of land to the amount of thirty thousand acres, or its equivalent, was made to each state in the Union for each senator and representative in Congress to which the state was entitled by the apportionment of the census of 1860. The proceeds under this Act were to constitute a perpetual fund. The principal of this fund was to remain forever undiminished; but the interest arising from the fund was to be inviolably applied by each state that should avail itself of the benefits of the Act, to the support and maintenance of a "College where the leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." Ninety thousand acres of land were apportioned to Oregon; and by an Act approved October 9, 1862, the Legislative Assembly of Oregon accepted the provisions of the Congressional law.

The Land-Grant Fund. The subsequent sale of this land has netted the College approximately \$200,000. This at present is invested in securities bearing six percent interest. The Act of Congress of 1862 explicitly demands that no part of the funds so appropriated, or the interest arising therefrom, shall be used for the purchase, erection, or maintenance of any building or buildings.

The Hatch Fund. Under an act of Congress, approved March 2, 1887, the College receives \$15,000 a year for the maintenance of an Agricultural Experiment Station, "to aid in acquiring and diffusing among the people useful and practical information on subjects connected with agriculture."

The Morrill Fund. On August 30, 1890, an act was passed by Congress "to apply a portion of the proceeds of the public land to the more complete endowment and support of the colleges

for the benefit of agriculture and the mechanic arts established under the provisions of the Act of 1862." This act provides that in 1890, \$15,000 should be paid to each of the land-grant colleges, and that the amount so appropriated should be increased by the sum of \$1,000 annually for ten years, and that thereafter the amount annually appropriated should continue to be \$25,000. Under an act of Congress, approved March 4, 1907, known as the Nelson Amendment, this fund was increased by the sum of \$6,000 for the fiscal year ending June 30, 1908, and by an additional \$5,000 for each succeeding year until the total annual amount, in 1912, reached \$50,000.

The Adams Fund. An act of Congress, approved March 20, 1906, appropriated an initial \$5,000 for that year, and \$2,000 additional for each year thereafter until the annual amount should reach \$15,000. This fund is "to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry" of the State, and therefore supplements the Hatch Fund in the maintenance of the Experiment Station.

The Smith-Lever Fund. This fund was established by the Smith-Lever Agricultural Extension Act approved by Congress May 8, 1914. By its provisions the Oregon Agricultural College received \$10,000 from the Federal Government to apply towards the support of the Extension Service for the fiscal year ending June 30, 1915. This sum will be increased annually for seven years until the total amount of \$30,200 is reached. This amount will continue as a permanent appropriation as long as an equal sum be "appropriated for that year by the legislature" of the State, "or provided by State, county, college, or local authorities, or individual contributions within the State for the maintenance of the co-operative agricultural extension work provided for in this Act."

Summary of College Funds. The College, therefore, receives annually from the National Government the following income: (a) interest on the land-grant sales fund, \$12,000; (b) the Hatch fund, \$15,000; (c) the Morrill fund, \$50,000; (d) the Adams fund, \$15,000; (e) the Smith-Lever fund, (1915-16) \$14,446.36.

In addition to this income derived from the National Government, the College is dependent upon the income from the millage-tax, as provided by the State legislature of 1913, which became operative April first, 1915.

HISTORY

As there were no State colleges in Oregon in 1868, the legislature of that year, which provided for the location of the land received under the Act of 1862, gave the interest on the funds derived from the sale of the land to the Corvallis College, a private institution in Benton County, which was then under the control of the Methodist Episcopal Church, South. For a number of years, none of the land granted was sold, and the legislature made small annual appropriations for the support of the school.

In 1885, the church voluntarily relinquished its claim on the funds of the College, and the State assumed entire control of the institution. The legislature of that year provided for the "permanent location of the State Agricultural College at Corvallis, in Benton County," on condition that the citizens of said county should, within four years, erect on the "farm containing thirty-five acres in the immediate vicinity of said city, known as the Agricultural College Farm, brick buildings for the accommodation of said State Agricultural College at a cost of not less than \$20,000." During the summer of 1887, the corner stone of the building erected by the citizens of Benton County was laid by the Governor of Oregon amid imposing ceremonies.

This structure, now known as the Administration building, was the nucleus around which other buildings soon began to cluster, as necessity and growing interest demanded. For a year or two there was ample room; but, as the institution grew, more land was needed and provided, and the institution now owns, instead of the thirty-five acres originally comprising the campus and grounds, three hundred and forty-nine acres; and instead of one structure, thirty-six. There has also been a marked increase in the attendance, from ninety-seven to over four thousand students. Twenty years ago, most of the students came from Benton and neighboring counties. Today, every county in Oregon, 32 other states, and 14 territories and foreign countries are represented. The increase in the number of students called for an increase in the number of the faculty. This body, from the number of five in 1884, has grown until it now closely approaches two hundred. Other features usually found in connection with progressive educational institutions have grown in equal ratio. The courses have been strengthened, the standards, both for entrance

and graduation, have been advanced, and other improvements have been made from time to time, which have added to the thoroughness and efficiency of the work.

ORGANIZATION

The Oregon Agricultural College is organized into the three grand divisions that characterize the work of the land-grant colleges throughout the country; namely, Resident Instruction, Experiment Station, and Extension Service. Resident Instruction, which includes all work of teaching students at the institution, is the most distinctive feature of the College life. It has always been regarded as of first importance, and will doubtless continue to be so regarded, in spite of the increasing usefulness of extension work. The Experiment Station, through systematic experiments, investigation, and research, is engaged in a search for fundamental truth. Its work is of great importance; for without it, the work of the other two grand divisions would soon become sterile and ineffective. The Extension Service, which is the newest of the three grand divisions of the College, includes all means of imparting the message of the College to the people in their own communities. It is virtually an effort to make practical and more or less immediate application throughout the State of the available truths worked out by the Experiment Station or used for resident instruction.

GOVERNMENT

The general government of the College is vested primarily in the Board of Regents, and, under their control, in four other administrative bodies—the Administrative Council, the College Council, the Faculty, and the Experiment Station Staff. These bodies, in the exercise of their respective duties, determine the questions of policy and regulate all matters relating to the interests of the institution.

The Board of Regents consists of thirteen members, of whom the Governor, the Secretary of State, the Superintendent of Public Instruction, and the Master of the State Grange, are ex-officio members. The nine other members are appointed by the Governor with the approval of the State senate, and hold office for a term of nine years. Under a law of the State legislature, passed in 1885, the Board of Regents constitutes a body corporate, under the name

of "The Board of Regents of the State Agricultural College, * * * with power to sue and be sued, and to make contracts," and to enact such regulations as may be necessary for the maintenance and development of the College.

The Administrative Council consists of the President of the College, the Director of the Experiment Station, the Director of Extension, the Deans of the different Schools, and the Director of the Summer School. The function of this Council is to consider and determine the larger questions of policy and administration.

The College Council is composed of the President of the College and all officers of administration and instruction with the rank of professor, associate professor, or assistant professor. This body considers all general questions relating to the educational work and policy of the College; arranges and correlates the courses of study, and determines the requirements for admission and graduation. The different committees of the College Council, representing the several schools of instruction, have charge of the enrollment and progress of students in the respective schools, and investigate the records of all candidates for graduation.

The College Faculty comprises members of the Administrative Council and the College Council and all other instructors, including members of the Experiment Station and Extension Service Staffs. It considers routine questions of method and discipline, a function for which it is particularly well adapted, being in close contact with all that pertains to student interests and student life.

The Experiment Station Staff includes the President of the College, the Director of the Experiment Station, the heads of the various departments of the School of Agriculture, and all assistants, engaged in research and experimental work. The members of this staff are engaged in the investigation of problems encountered in the development of the agricultural interests of the State. They also distribute, by means of correspondence, circulars, and station bulletins, information regarding their investigations.

The Extension Service Staff includes the President of the College, the Director of Extension Service, the Secretary of Extension Service, the State Leader and County Agents, the officers in charge of Boys' and Girls' Club Work, Extension Field Specialists in Horticulture, Dairy Husbandry, Agronomy, Animal Husbandry, Poultry Husbandry, Organization and Markets, Highway Engineering, Home Economics, Farm Management Demonstrations,

and members of the Resident Instruction Staff and Experiment Station Staff who assist in extension work.

The Students. The College does not undertake to prescribe in detail either its requirements or prohibitions. Students are met on a plane of mutual regard and helpfulness. Since the advantages of the institution are provided at public expense, the students are under special obligation to perform faithfully all their duties, not only to the College, but also to the community and to the State. Whenever the deportment of any student is such that his influence is inimical to the interests of the institution, he will be relieved from further attendance.

PURPOSE AND SCOPE

The purpose of the College is to provide, in accordance with the acts of Congress under which it is maintained, a liberal, thorough, and practical education—an education that will afford the training required for efficient service in different branches of industry. The distinctive technical work covers the three great fields of production, manufacture, and commerce. Special attention is given to the application of science. All the practical work in the laboratories, in the shops, in the orchards, and on the farm, is based on scientific principles. While the industrial or technical work is emphasized, the importance of a thorough general training, of mind development, and of culture, is recognized in all of the work throughout the institution. The object is to meet the demand for a broad and general education, supplemented by special technical training.

The work, therefore, covers a broad field, including technical courses along the different lines of agriculture, forestry, home economics, engineering, mining, commerce, pharmacy, industrial education, and industrial arts; with the necessary training in the basic subjects of mathematics and the natural and physical sciences; and also the general training in language, literature, history, economics, political science, civics, military tactics, and physical education, which constitutes an essential part of a liberal education.

In all the work of the institution, the object is to train the mind, the eye, and the hand to act in unison; to unfold and co-ordinate the faculties of mind and body; to develop a symmetrical manhood and womanhood, and a just appreciation of clean, upright citizenship.

LOCATION

The seat of the Oregon Agricultural College is Corvallis, a city of six thousand inhabitants, situated at the head of navigation on the Willamette River. As the name implies, it is in the heart of the far-famed Willamette Valley. It is readily accessible by steam and electric railway from all parts of the State; it has free mail delivery; there are many churches and no saloons, and the moral tone is equal to that of any city within the boundaries of the State. It is a city of homes, and its people are justly proud of the great institution in the midst of them, and jealously guard its good name.

Situated on high, well-drained land, open to the invigorating sea-breeze, Corvallis is one of the most healthful cities in the State. It has never been visited by any dangerous epidemic disease, and the possibilities of such visitation in the future appear remote; for the city has a complete modern sewerage system and first-class gravity water system, supplied from springs high up the slope of Mary's Peak, the tallest mountain in the Coast Range, some fifteen miles away to the westward. The city and its environs are conducive to wholesome student and home life. It has an ample supply of pure mountain water for all domestic and sanitary purposes. The atmosphere is purified and the climate ameliorated by almost constant ocean breezes—warm in winter and cool in summer. The surrounding landscape elicits praise from all who behold its delightful charms as viewed in the extensive area of fertile fields, gardens, and orchards. The wooded glens of the near-by foothills, and the lively mountain brooks, or the more pretentious streams frequented by canoe, row-boat, and launch parties, are fruitful sources of recreation; while the magnificent distant views to the eastward, where the fir-clad Cascade Mountains, with their wealth of trees and the perennially snow-capped sentinels—Hood, Jefferson, and the Three Sisters—present a constant panorama of picturesque mountain scenery. With such an environment, the city is truly an ideal location for a college and a home.

GROUNDS AND BUILDINGS

The College Grounds comprise three hundred forty-nine acres. That part of the grounds, ninety-one acres in extent, lying immediately about the several buildings, east of Cauthorn Avenue, and

usually designated as the lawns and campus, is tastefully planted with both native and exotic ornamental trees, shrubs, and herbs. The one hundred and forty-three acres used for the farm, garden, and orchard operations, is so plotted and planted as to meet the demands of the various lines of work and still conform to a general scheme of landscape embellishment. This portion occupies a slightly elevated and gently undulating site wholly within the western limits of the city of Corvallis. In addition to the above plot, one hundred and fifteen acres, comprising the College stock farm, together with the horticultural and poultry tracts, lies just south of the city limits. Broad drives and walks traverse the campus in all directions, thus rendering every objective point easily accessible. The numerous specimen trees, groups of shrubbery, and massed borders are a source of enjoyment as well as of instruction to all those who frequent the grounds. The scheme of planting has been such as to give an air of peaceful activity, orderly effort, earnest purpose, and quiet refinement. Daily association with such scenes for a period of years, during the time when men and women are forming the habits of thought and action that will be theirs through life, is certain to have a deep-seated and enduring influence for good in molding the character of future citizens.

The following brief descriptions will convey a general idea of the principal buildings and the purposes for which they are used:

The Administration Building is a three-story brick structure, 90x120 feet, containing recitation rooms, the library, the offices of the President, the Registrar, the Business Manager, and the Director of the School of Music. Centrally located and on a slight eminence, it commands an unsurpassed view of the campus, the city of Corvallis, and the picturesque Cascades.

Science Hall, situated southeast of the Administration building, and constructed of gray granite and sandstone, covers a ground space of 85x125 feet, has three stories and basement, and contains fifty-five rooms. It is one of the most serviceable buildings on the grounds, and within it, at present, are the School of Forestry, and the departments of Pharmacy and Chemistry, with their various laboratories, recitation rooms, and lecture halls, together with the offices and laboratories of the Experiment Station chemists. The School of Forestry, however, will be moved from this building to the new Forestry building before the opening of the college year 1916-17.

Agricultural Hall, standing southwest of the Administration Building, is the largest structure on the campus. It is an imposing edifice of brick and sandstone, consisting of the central or Administrative building, the north or Agronomy wing, and the south or Horticultural wing.

The central or Administrative building is 66x140 feet, four stories and basement, and contains conveniently arranged and well-lighted class rooms, laboratories, and offices. On the first floor are the offices of the Director of the Experiment Station and Dean of the School of Agriculture, the Professor of Poultry Husbandry, the Director of Extension Service, the State Leader of County Agriculturists, the State Leader of Industrial Clubs, the Editor of Publications, the Editor of Press Bulletins, and the College Exchange. The second floor is occupied by the department of Animal Husbandry, and the department of Industrial Education; the third floor, by the departments of Zoology and Entomology with their respective museums; and the fourth floor, by the departments of Bacteriology and Art.

The north or Agronomy wing is 72x130 feet, three stories high. It is thoroughly modern in all its equipment, and while intended solely for the work in Agronomy, at present accommodates, temporarily, two departments. The first and second floors occupied by the department of Agronomy, contain in addition to the offices of the Agronomy department, rooms variously devoted to laboratory and class purposes in Agrostology, Soil Physics, and kindred subjects. The third floor is used by the School of Commerce.

The south or Horticultural wing is 72x130 feet, three stories high. In the basement are located laboratories for plant propagation, spraying, vegetable preparation, and fruit packing. The basement also contains the general storage rooms for the department, and rooms which are especially adapted for the storage of fruits. The first floor contains the offices of the division of Horticulture, the research laboratory, systematic pomology laboratory, and three large lecture rooms. The second floor contains the offices and museums of the department of Botany and Plant Pathology, recitation rooms, and student laboratories. The third floor contains the horticultural museum and horticultural herbarium, photograph room, large student lecture room, draughting rooms, lecture rooms, and office of the Landscape Gardening section. These rooms are all especially well lighted and contain every convenience for conducting the work with efficiency.

Greenhouses. A new range of greenhouses, modern in every respect, has recently been constructed with a view to aiding the student in his studies in commercial greenhouse work. The range is made up of five even-span houses, three ninety feet long by twenty feet wide, and two thirty-three feet long by twenty feet wide, making the total area under glass 6,720 square feet. A modern hot-water heating apparatus has been installed, with valves and pipes so arranged that different temperatures can be maintained in every separate thirty feet of house in the three long houses. Each of the large houses has been divided into sections thirty feet long, so that the entire space in each may be given up to a single crop. Of the two smaller houses, one is given up to research work, and one to the propagation of plants in general. The central building is large and conveniently arranged for all work that is to be met with in greenhouse establishments. Such crops as carnations, chrysanthemums, violets, palms, ferns, general pot plants, and forced vegetables, like tomatoes, lettuce, and cucumbers, are grown in these houses.

Dairy Building. About sixty feet to the northward of the Agricultural building is located the Dairy building. The general scheme of both outside and inside finish is similar to that of the Agricultural building. The structure is 54x141 feet, three stories high. On the first floor are located the offices of the Dairy department and commodious laboratories for butter-making, cheese-making, and market milk instruction, including a well-equipped boiler and engine room and student lockers. On the second floor are the testing laboratory, advanced laboratory, farm dairy and shop rooms, veterinary laboratories, etc. The third floor is temporarily occupied by the department of mathematics, with the exception of a general lecture room, extending across the south end of this floor, and having a seating capacity of two hundred.

The Forestry Building, which is now being constructed, will be ready for occupancy with the opening of the college year 1916-17. Its outside dimensions will be 80x140 feet. The basement floor will be devoted to laboratories containing equipment for logging, milling, and timber preservation, as well as a working collection of manufactured wood products. The first floor will contain the laboratories for forest mensuration and forest protection as well as the offices of the School of Forestry. The second floor will provide space for a large drafting room, laboratories in timber technology, dendrology and silviculture, lecture room, class rooms, reading room, and seminar room.

Home Economics. The first wing, 68x120 feet, of the new Home Economics building is occupied by the departments of Domestic Science and Domestic Art. The building is located directly west from the Dairy building. It consists of three stories above a high basement, and is finely built of brick and stone. The most modern type of heating and ventilating systems are installed, and all provisions are made for the comfort and convenience of the young women carrying the work in Home Economics. Offices for the Professors of Domestic Science and Domestic Art and the assistants in both Domestic Science and Domestic Art, are on the first, second, and third floors.

The food laboratories are on the first and second floors, while the Domestic Art department has all of the third floor of the building and part of the second floor. Ample locker and dressing rooms are provided for the convenience of the students, and hot and cold water is supplied in all parts of the building. The housing and equipment of the School of Home Economics, in short, are thoroughly modern and adequate.

The Mines Building, which is 65x81 feet in dimensions, is located about 100 yards northwest of the Administration building, and is one of the newer buildings on the campus. This building forms the northern boundary of the quadrangle which is planned in the new building scheme on the College campus. It is a fine four-story structure, constructed of brick, trimmed with stone, and similar in type to Agricultural Hall. The first floor of the building contains the main offices, assaying, metallurgical and ore-dressing laboratories. The basement contains the crushing and sampling rooms, the ceramic laboratory, and the stock rooms. On the second floor will be found the Bureau of Mines laboratory and lecture and class rooms. On the third floor is the geological museum, the mineralogical and petrological laboratories, and draughting room. All the laboratories are provided with water, gas, electric lights, and steam heat.

Mechanical Hall, situated about one hundred and fifty yards northeast of the Administration building, is 90x120 feet, two stories high, and constructed of Oregon gray granite and sandstone. It is an attractive, substantial building, well arranged and admirably adapted to the purposes for which it is used. Besides recitation and lecture rooms for the classes in Industrial Arts, Mechanical, Electrical, Civil, Highway, Irrigation, and Experimental Engineering, it contains the Physical and Engineering laboratories.

Mechanical Arts Building is a modern, well-lighted structure of brick, with cement foundations, 52x52 feet, two stories high, flanked by a one-story wing on the east, 40x220 feet, and a similar wing on the south, 40x200 feet. The central portion contains the office of the Dean, a display room for student work, a tool room for the machine shop, and a finishing room for the wood shop. On the second floor is a general draughting room, 30x50 feet, with a commodious blue-print room and a dark room adjoining. The south wing contains the main woodworking shop, 40x97 feet, a stock room, 30x40 feet, a carpenter shop, 20x40 feet, and the College printing plant, 40x50 feet. The east wing contains the machine shop, 40x80 feet, the blacksmith shop, 40x100 feet, store room for coal and iron, lockers, and toilet rooms.

The Foundry, which is located immediately south of the blacksmith shop, is built of brick. It contains one 22-inch Colliau cupola for melting iron, one brass furnace, one portable core oven, one stationary core oven for larger work, one twelve-hundred-pound crane ladle, one eight-hundred-pound crane ladle, and several smaller ladles. It contains also one crucible brass furnace, one two-ton jib crane, one post crane, one No. 2 Delano pulley molding machine, one tumbling barrel for cleaning castings, and a liberal supply of smaller tools, flasks, etc.

The Women's Gymnasium is situated about two hundred yards south of the Administration building, and is erected against a gently sloping bank on Jefferson street. The structure, 70x120 feet, is built of stone and wood, and comprises a high, airy basement, or first floor, facing east, with the main floor above it, having a bank entrance on the west end. The first floor of the building is devoted to locker rooms, dressing rooms, bathrooms, and offices, together with a rest room and a special room for corrective gymnastics. The second floor consists chiefly of one large gymnasium room, which is also frequently used as a lecture hall, assembly room, and social center for moderate-sized gatherings. This room, which comprises 8,000 feet of floor space, is surmounted by a balcony running track, suspended from the trusses. It affords facilities, in a court of 79x54 feet dimensions, for basketball, indoor baseball, tennis, and various winter and indoor games. The building affords ample accommodations for the physical training of all the women of the institution.

The Men's Gymnasium is situated immediately west of Waldo Hall on Jefferson street, adjoining the main athletic field. The structure is to consist of four units, the central part being 90x150 feet, with each wing 52x96 feet in dimensions. The fourth unit will provide a swimming pool 50x100 feet, of modern design and finish. Only two units were completed during 1914, the main hall and the east wing. The main hall is used as a lecture and assembly room, or a place for entertainments when large audiences are to be accommodated. The showers and the baths are of modern design, providing hot and cold water throughout the year. The floor of the main hall with its 13,500 square feet of surface, provides space for three basketball courts, indoor baseball diamond, and space for various winter and indoor games. The east wing provides boxing and wrestling rooms, and an auxiliary gymnasium with special apparatus for use of the individual and for corrective gymnastics. When completed, the building will have accommodations for upwards of 2,000 men.

The Armory is situated about three hundred yards south of the Administration building. It is one of the largest of its kind in the United States and is built of concrete and steel, 126x355 feet. The drill hall portion has an unobstructed area of 36,000 square feet. The arms room, offices, and drill hall afford facilities for the accommodation of 1,000 men.

The New Heating Plant, located at the south end of the Armory, is a one-story reinforced concrete building, with a concrete tunnel and conduits leading to the various buildings on the south side of the campus. It contains three boilers, one two-hundred-ninety, one two-hundred-fifty, and one one-hundred-fifty-five horsepower, with the necessary equipment for heating the buildings connected with it.

The Power Plant, a one-story brick building in the rear of Mechanical Hall, contains the requisite equipment for supplying the various buildings with heat, light, and power. The apparatus installed in this building serves the purpose also of demonstration equipment in these special lines.

Waldo Hall, one of the two halls of residence for women, occupies a commanding site one hundred and fifty yards west of the Armory. It is a large building of striking appearance, with a cement foundation and basement wall, and a cream-colored, pressed-brick superstructure, three stories high. The dimensions

are 96x240 feet; and it contains one hundred and twenty-five rooms for students, besides a kitchen, dining room, and parlors. It is modern in all its appointments and finished throughout in natural grain Douglas fir, stained to conform to the color scheme.

Cauthorn Hall, the second of the women's halls of residence, is a well-proportioned frame building, situated on a commanding spot in the western part of the campus. It is 160x50 feet, has three stories and basement, and contains sixty-two rooms, besides a large kitchen, dining room, and reception rooms. Its furnishings and appointments are adequate, modern, and in harmony with its use. Each floor is supplied with hot and cold water, baths, electric light, and steam heat.

Shepard Hall, the student building under the auspices of the Y. M. and Y. W. C. A., was completed at a cost of something over \$22,000. This building contains in the basement a swimming pool, shower baths, lockers, banquet room, kitchen, wood room, and accessories. The first floor contains a large lobby which is used for a reading room, game room for social events, and general assembly. It also contains offices for the General Secretaries, a public office, a cabinet and check room combined, and a room for the Y. W. C. A. The second floor contains six rooms for the use of the literary societies, the Athletic Association, and the staffs of the different College papers. The third floor is devoted for the present to dormitory purposes. The building, known as Shepard Hall, is a fitting tribute to the memory of Clay Shepard, who gave his life to the cause of cleaner, higher, and truer citizenship as exemplified in student life.

Farm Buildings. The College Farm is now well equipped with farm buildings, and modern facilities for conducting practical and scientific work in animal husbandry.

The Dairy Barn is commodious, modern, and attractive in design. It is a frame building, with cement foundation and brick pilasters. The main part is 50x100 feet, two stories high, with two wings extending to the south, each 46x80 feet, one story in height. There is also a milk room, an engine room, and a fuel room. The building is utilized as a general barn, and will accommodate nine horses and seventy cattle, with sufficient space for the storage of feed. On the first floor of the main portion are located the horse stalls, bins for storing the various grains and mill feeds, a seed room, and space for vehicles. The concrete basement

is of sufficient dimensions to permit the storing of about one hundred tons of roots. The second floor has a storage capacity for one hundred tons of loose hay. A prominent feature of the barn is the cow stable. This is strictly modern, well lighted and ventilated, with concrete floor, thirty individual, tubular-iron adjustable stalls, and three commodious box stalls. The aisles are wide, and thus not only furnish an abundance of air space for the animals, but also afford visitors an excellent opportunity to view the stock. The milk and engine rooms are conveniently situated, but sufficiently isolated for proper sanitation. This building is lighted by electricity, well supplied with water, thoroughly sewered, and furnished with an elaborate system of bell traps. Adjoining this stable is a stave silo, built several years ago, and a new concrete silo, completed in 1914, for use of the Dairy Husbandry department.

The old barns were moved and remodeled so as to harmonize with the new structure. They contain rooms for housing machinery, and a commodious piggery.

The New Cattle Barn. The department of Animal Husbandry is fortunate in having been able to erect a modern beef-cattle and sheep barn. It is located just west of the old barns, and has a floor space of 52x120 feet for sheltering stock. The hay loft has a storage capacity for 300 tons of hay and straw. Adjoining the barn are several concrete-floored exercise lots and a new stave silo. Especial conveniences are provided for the feeding, watering, weighing, and handling of live stock. The west half of the barn is at present devoted to beef cattle and the east half to sheep, although it is planned that the entire barn will eventually be used for beef cattle.

The Stock-Judging Pavilion. The Animal Husbandry work of the College is greatly facilitated by a judging pavilion, which provides very comfortable and commodious quarters for all of the demonstration work with live stock. The main room is 40x90 feet, well lighted, and provided with heat. A movable partition is provided whereby this large room may be divided into two smaller ones, each large enough for all ordinary purposes. The live-stock work in the past has been very much handicapped by crowded quarters without heat or good light, but these difficulties are now past and the department is in a position to do much better work than before.

Farm Mechanics Building. A modern building has recently been completed for the Farm Mechanics work. It is an attractive, well-lighted brick building, having a large operating floor, a class room, locker room, shop, and tool room on the first floor. This operating floor is of cement and is roomy enough for demonstration and for the operation of the heavier farm machines. Within this place is reserved space for the very heavy farm tractors. A gallery surrounds this operating floor and provides space for the lighter farm implements such as tillage, haying, and harvesting machines.

The building is equipped with shafting, belting, and power for the operating and testing of the various machines, and a large well is provided for making pump tests. A very complete equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest; so that the student has constantly before him and is working with and studying the very best classes of farm machinery of all types.

Representative machines are found in the laboratory as follows: plows, harrows, pulverizers, cultivators, plant-setting machines, corn planters, potato planters, grain and grass seeders, mowers, rakes, binders, sprayers, manure spreaders, potato diggers, wagons, etc. Among the power machines are stationary gasoline engines, various types of pumps and pressure water systems, feed grinders, gasoline tractors, steam tractors, gang plows, and complete threshing machines. All of this expensive equipment is available to students in Farm Mechanics in the regular and short-course work.

The Poultry Houses. On a five-acre tract of land, lying south and west of Cauthorn Hall, there have been erected several buildings especially planned for the needs of the department of Poultry Husbandry. The main poultry building is a three-story structure and is used principally for class, laboratory, and demonstration purposes. It contains a demonstrating room with desks and other necessary equipment; a shop, with the necessary tools, benches, and equipment for practice work in building poultry-plant equipment; storage rooms, office, and wash rooms are also provided. In the basement, rooms are provided for fattening and killing fowls, an incubator room for student use, and a feed room with the necessary machinery for grinding and mixing poultry feeds. Besides the main poultry building there is an incubator house, with a capacity

of twenty-four incubators and complementary apparatus; and a feed-storage building and a brooding house. There are also colony houses for laying and breeding stock and growing chicks. The colony houses are movable and constructed upon a plan that could be adopted by any farmer. The colony brooding coops are also portable, and are used for investigations in both natural and artificial brooding.

COLLEGE ORGANIZATIONS

One of the most important factors in rounding out the results and benefits of a college course is the society, club, or association work. As a result of the diverse interests of college life and the varied tastes of the students, the following organizations, besides many others, are maintained by students and faculty:

The Student Body Assembly. This is an organization of the entire student body, working under a constitution and by-laws approved by the faculty, and having general authority over all student enterprises. In order to secure an effective administration of the business coming within its jurisdiction, there are permanent committees on athletics, publications, oratory and debate, and such special committees as the assembly may by vote determine. Officers are elected yearly, and nominations and elections are conducted in a manner similar to that of the State electorate.

Student Self-Government. A system of student self-government has been established at the College which places the general disciplinary powers of the institution in the hands of the students. The Student Council, an organization made up of thirteen students, seven of whom are seniors, three juniors, two sophomores and one freshman, has been created and vested with such powers as are necessary to enforce the rules and regulations adopted by the students. Members of the Student Council are elected annually by popular vote of the student body.

The Literary Societies. These organizations have the common purpose of promoting literary work among the students. The weekly literary programs and occasional joint meetings tend to this end. The Shakopean is essentially an honorary society, membership depending upon honors won in debate or oratory at the College. To stimulate interest in debate and oratory, there are held during the year intersociety, intercollegiate, and interstate contests. Gold medals and cash prizes are presented to the winners

in the contests, and the successful society in debate receives the "Gatch Cup." This is the silver cup that was presented in 1901 by Dr. Thomas M. Gatch, then president of the College, to the society that had received highest honors in the season's debates. Annually this cup is to go to the successful society in debates, but it is ultimately to become the property of the society winning it three years in succession. Many and determined have been the battles for its possession, but the cup is still without a permanent home.

The Christian Associations. The Young Men's Christian Association was organized in the Oregon Agricultural College as a part of the International Brotherhood in 1890. Since that time it has grown until it includes in its membership nearly one-half the men in the Student Body. The erection by the Y. M. C. A. of Shepard Hall, the student community building, which contains a swimming pool, reading, social, and game rooms, has greatly increased the scope and added to the effectiveness of the work. The Association aims to provide a high moral atmosphere and pleasant social advantages for its members and their fellow students. Members are trained in executive and committee service in work for their fellows and the community. Meetings are held in Shepard Hall each Tuesday evening; Bible, Mission, and social-study classes are regularly conducted; visitation committees call on students who are ill or disheartened; school boys of Corvallis are organized into clubs and Boy Scout patrols; regular socials are held in conjunction with the Women's Association; and extension work is conducted in vicinities near Corvallis. On registration days, committees are on hand to assist students in securing comfortable quarters in good homes and in adjusting their work satisfactorily. Those who make their way through College will find the employment bureau of the Association always ready and glad to assist them as far as possible in securing positions.

The Y. W. C. A. aims to cooperate with all the forces of the College in promoting among the women students a well-developed life. The rooms of the organization are located in Shepard Hall, the student community building. On registration days committees are appointed to meet incoming students and to help them in adjusting their work. Those who wish to earn their way through College will find the employment department ready and glad to assist them as far as possible in procuring positions. Weekly

meetings are held in Shepard Hall on Thursday, and there is a Sunday Vesper service to which all women are welcome. Bible and Mission Study classes, social service work, socials and teas, all tend to make up the program for the year's work. Three-fourths of the women in College are members of the Y. W. C. A. and more than that number are enrolled in voluntary Bible Study.

The Athletic Association. This organization, maintained by the students through the student body assembly, encourages wholesome competition in the various outdoor and indoor sports and pastimes. It has charge of all details pertaining to the conduct of intercollegiate athletics in which the College may be interested. A committee of the faculty has general supervision over the whole subject of athletics, thus insuring a sound and conservative management.

College Folk Club. This club was organized in October, 1908. Membership is open to all women of the faculty and other women employees of the institution, and to the women members of the immediate families of the faculty and other employees. The object of the club is social diversion, general culture, and the promotion of the best interests of the College and the community. The organization at this time is divided into three sections: Sociology Section, Mothers' Section, and Dramatic Section. Aside from the semi-monthly meetings of the various sections, the general club convenes on the first Saturday of each month, at which time an address is given by an outside speaker, or a musical or literary program is furnished by members of the club. In January, 1913, the organization became affiliated with the Oregon State Federation of Women's Clubs. It is the purpose so to extend the work of the club as to effect the greatest possible good to the College and to the city.

The Mask and Dagger. This club was organized for the purpose of offering special training in dramatic art. A semi-annual "try out" is held in which all students of the institution may participate, and any who possess talent in this direction may be elected to membership in the club. No student, however, will be permitted to take part in a public production who has not an average for all of his College work, at the time the play is being prepared, of 75 percent. Platform exhibitions will be given and standard plays presented during the College year.

The Oratorical Association. This body has immediate charge of all business pertaining to the competitive work in oratory and

debate. Schedules, dates, prizes, conditions of competition, and all similar matters are in its care.

Intercollegiate Debate and Oratory. Each year the Oregon Agricultural College has three intercollegiate debates, putting into the field six teams, three supporting the negative and the others the affirmative of the same question. The College sends one representative each year into the old-line State Oratorical Contest in which eight colleges take part. Gold medals are awarded to the men who represent the College in these events. Each year also the College sends a representative to the State Peace Oratorical Contest, where two prizes of \$75.00 and \$50.00 respectively are awarded for first and second place.

Local Debate and Oratory. A local peace oratorical contest is held annually, to the winner of which the Cosmopolitan Club of the College presents a cash prize of ten dollars. There are also interclass contests in Declamation, Debate, Oratory, and Extempore Speaking, prizes being awarded by the Oratorical Association to the winners of these events. These latter contests are forensic events in the annual Interclass Forensic-Athletic Championship Contest, wherein the four classes compete for individual prizes and three loving cups—the Shakopean Cup, which becomes the permanent property of the highest individual forensic point-winner of the class winning the championship; the Orange O Cup, which becomes the property of the best athlete in that class; and the Barometer Cup, which is held one year by the class winning the interclass championship.

The Sphinx. This is the senior honor society. Membership is acquired by election based on prominence in student activities and excellence in scholarship.

The Forum. This society was organized by the junior and senior classes in the spring of 1914, its primary purpose being to recognize efficiency in scholarship among junior and senior students. Election is made to the society by its own members. The fact that high standards of general excellence have been set by charter members makes it a decided honor to any student to be elected to membership.

The Cosmopolitan Club. This is an organization of foreign and American students. It is a local chapter of the Association of Cosmopolitan Clubs of the World. Its purpose is to provide social and educational advantages for its members and to promote inter-

national friendship. At present, nine nations are represented in the local chapter.

The Agricultural Club. This club was established for the purpose of advancing interest in the various phases of agriculture, and promoting the investigation and discussion of both general and special agricultural subjects. Suitable programs are prepared for each meeting, and whenever practicable, leading authorities on practical agriculture are engaged to address the members.

The Lewelling Club. This is the Horticultural Club conducted under the auspices of the Horticultural department. There is no regular organization, except an executive committee, which has power to transact such business as requires action on the part of the club. It is open to all students interested in horticulture.

The Withycombe Club. Membership in this club is open to all students taking Animal Husbandry work. The meetings of the club are devoted to discussion of Animal Husbandry topics not ordinarily covered in formal class-room instruction.

Delta Theta Sigma. There is established at the College a local chapter of this national honorary agricultural fraternity. The aim of the society is to advance the study of agricultural subjects by giving honorable recognition to students taking the lead in this work. Elections to membership are made from the junior and senior classes by the members of the local chapter.

The Forest Club. This is an association of students and instructors "formed for the purpose of promoting the forestry interests of the State." In order to carry out its purposes, it meets twice each month. The first meeting of each month is purely of a social nature, with each alternate meeting for the discussion of current forestry literature, magazine articles, news items, legislation, and general progress movements pertaining to forests, forest service, forest products, forest industries, lumbering, and the lumber trade.

The Civil Engineering Club. This is an organization within the departments of Civil and Highway Engineering. The active membership is drawn from the junior and senior classes, and the privileges of associate membership is extended to the members of the two lower classes. It meets weekly for the discussion of subjects of interest to the civil and highway engineer.

The Electrical Engineers. This is a College branch of the American Institute of Electrical Engineers. The aim of the organ-

ization is to discuss the topics contained in the monthly proceedings of the A. I. E. E., and in this way develop in the student an intimate knowledge of the activities of the national organization, thereby coming into closer touch with the practical problems in the engineering world and becoming better fitted for their life work.

The Miners' Association. This body has for its object the discussion of technical engineering subjects; the review of current mining literature; the presentation of original papers by the active members; and occasional lectures on special mining topics by men outside of the College.

Mechanical Engineers. This is a local College society of students and faculty people interested in Mechanical Engineering. The purpose of the association is to keep in touch with the practical problems of the engineering world.

Sigma Tau. This is a local chapter of the national honorary engineering fraternity, chapters of which exist at nearly all of the recognized technical schools of the United States. Membership in the fraternity is restricted to junior and senior students in Engineering and Forestry, election to membership being based principally upon excellence in scholarship.

The Home Economics Club. This is an organization for the purpose of bringing all the women of the School of Home Economics into closer touch with one another than is possible without a central organization. The aim of the club is to give, by a series of monthly meetings, a general survey of Home Economics questions not covered in regular class-room work. The aim is carried out by means of well-directed discussions and by securing outside lecturers who by virtue of their training and experience are considered authorities on subjects relating to Home Economics.

Theta chapter of Alpha Kappa Psi, a national fraternity devoted to the profession of Commerce, was organized during the school year of 1913-14. The purpose of the fraternity is to promote investigation along scientific lines in all phases of commercial work. Membership is open only to students in the junior and senior year in the School of Commerce; and in order to become a member, the student must have shown himself a leader both in scholarship and in student activities.

The Commercial Club. This is a student organization within the School of Commerce. The purpose of the club is to bring its members into close relation with current methods and events in the commercial world. This is accomplished by discussions of

topics pertaining to commerce by members of the club, and by addresses at various times during the year by men prominent in the fields of law and business. Active membership is open to all members of the School of Commerce.

The Pharmaceutical Association. The main purpose of this organization, which consists of the pharmacy students, is to bring its members into closer relation with the current events of the pharmaceutical world. This is brought about by discussions in the meetings of topics pertaining to pharmacy, and by addresses at various times during the year by prominent pharmacists and salesmen of the State.

The Easterners' Club. Membership in the Easterners' Club is open to all students and faculty people who have at any time resided in those states situated east of the Mississippi River, or in those provinces of Canada east of Manitoba. The objects of the club are to promote the interests of the College throughout the East, to encourage prospective students from the East and to offer social diversion to its members by providing occasions for the mingling of ideas on such current events as the sports and politics, which are represented by the various states included within the membership.

The Eastern Oregon Club. This is an organization effected for the purpose of promoting the mutual interests of the College and the people of the eastern part of the State. Its members are afforded many social and intellectual advantages from the regular club meetings. Membership is open to all students from Eastern Oregon.

The California Club and The Washington Club are, as the names imply, composed of students whose homes are in California or Washington. It is for the purpose of bringing "Californians" and "Washingtonians" together socially that the clubs meet.

The Portland Club is composed of all of the students registering at the College from Portland, the primary object of the club being social diversion among those students who have been associated in their high-school work in previous years.

COLLEGE PUBLICATIONS

Two classes of publications are issued from the College; one official, published by the College authorities; the other, unofficial, published by the various student organizations.

The College publications include:

The Catalogue. The General Catalogue, published in the spring, contains much general and specific information as to the courses of study, equipment, and instruction, and gives a list of faculty members and students registered up to the time of publication.

The Alumni Directory. This publication gives in each edition revised information as to the name, year of graduation, degree, present occupation, and present address of each graduate of the College. The publication is issued every other year.

The Bulletins of the Summer School. These announcements contain specific information of expenses, courses of instruction, character of the work presented, and the requirements that prospective students must meet.

The Bulletins of the Winter School. These announcements carry such information regarding the winter courses as may fully present the advantages of these courses to the public.

Extension Bulletins. These bulletins consist of monographs on the various phases of Agriculture, Domestic Science and Art, Engineering, Mining, and Commerce, together with the bulletins and circulars issued in connection with the Industrial Club work for boys and girls in the public schools. They are written in such style as to be easily understood, thus meeting the popular demand for scientific knowledge and giving it in such form that the people of the State may profit by its application to the problems of everyday life.

The Station Bulletins. These publications include reports upon research problems and upon experimental investigations in agronomy, horticulture, dairying, animal husbandry, poultry husbandry, insect pests, plant diseases, domestic science, and special subjects of interest to the husbandman, conducted at the home Station or the several branch stations.

STUDENT PUBLICATIONS

The student publications comprise:

The Barometer. In March, 1896, the literary societies of the College began the publication of a monthly periodical, the "O. A. C. Barometer." The enterprise has met with deserved success, and "the organ of the student body" is now issued as a four-page, six column semi-weekly. It publishes the "news of the College," and is of general public importance as representing the interests, char-

acter, and accomplishments of the student body at the College. By action of the Board of Regents, resulting from a unanimous recommendation of the Student Body, a portion of the regular semester student fee of \$2.50 will be devoted to the "Barometer," and every student will regularly receive the paper.

The Beaver. This is the annual publication of the junior class, and made its initial appearance as "The Orange," in 1907. It is a high-class publication, substantially bound, and fully illustrated with photoengravings, pen and ink sketches, line and wash drawings. It is a full-dress carnival of the year's life, representing the dignity, the beauty, the versatility, the gaiety, the traditions, the sentiment, and the solidarity of the Oregon Agricultural College.

The Oregon Countryman. This is an illustrated monthly magazine, published by the Agricultural and Home Economics students under the supervision of the faculties of these courses. It is designed to be of special service to the farm home. Besides dealing with the work of the various College departments in a practical manner, it contains articles of scientific value contributed by the Experiment Station workers. Successful men and women of the State contribute articles for each issue.

The Student Engineer. This is a magazine devoted to engineering and mechanic arts. Its purposes are to record the engineering progress in the Northwest; to furnish news; to discuss methods relating to the mechanic arts; to publish records of scientific work done by the students in this institution; and to publish any matter of special technical and scientific interest. Items of interest will be found for civil, mining, mechanical, and electrical engineers, for foresters and others engaged in technical pursuits. The journal is under the supervision of the faculties of the Schools of Engineering, Mining, and Forestry, but the work and responsibilities of the publication are borne by the staff, elected by the students of the school concerned.

The Commercial Print. This magazine, published each semester by the students of the School of Commerce under the supervision of the faculty of the school, is devoted to the commercial interests of the College and State. Articles of merit are contributed for each issue by students, faculty, and prominent business men of the State. One distinguishing feature of the magazine is the publication each semester of a complete directory of all the members of the institution, students, faculty, and employees.

STUDENT EXPENSES

GENERAL FEES

Tuition is free to all students, regardless of the place of residence. The regular College fees, required of all students, with the exception of special students in music who take no other College work, are as follows:

Entrance fee, payable annually on registration.....	\$5.00
Incidental (Student) fee, payable each semester....	2.50
Diploma fee on graduation.....	5.00
Binding fee for graduation thesis.....	1.00
Vocational certificate fee.....	1.00

LABORATORY FEES AND DEPOSITS

Students are charged small fees in the different laboratory courses to cover the cost of material used; and deposits are required to cover cost of breakage in laboratory courses where breakages are likely to occur. These fees are payable at the beginning of each semester. At the end of the semester, deduction is made for actual breakage, and the balance of the deposit is refunded to the student. The fees and deposits charged each semester in the different courses are as follows:

Animal Husbandry:	Fees	Dep.
Courses A, 1, 16.....	.25	
Courses 101, 102, 210, 220, 230, 240.....	.50	
Courses B, E, 2.....	1.50	

Art and Architecture:**Art**

Courses 102, 103, 204, 205, 206, 305, 306, 411, 412, 505, 506.....	.50	
Courses 600, 601, 602, 603.....	1.00	2.00
Courses 413, 414.....	1.00	

Architecture

Courses 507, 508, 509, 512, 513, 515, 519, 533, 535, 536 .....	.50	
Courses 501, 502, 510, 511, 516, 517, 601, 602, 603, 604, 701, 702.....	.75	
Courses 537, 538.....	1.00	

		Fees	Dep.
Bacteriology:			
Courses 102, 203, 204, 302, 406, 701.....		2.00	
Courses 101, 201, 202, 205, 300, 301, 401, 501, 502		3.00	
Courses 111, 112, 116.....		4.00	
Chemistry:			
All Laboratory Courses			
Fees.....	One dollar per credit hour		

Health Service. Since this portion of the catalogue was printed, arrangements have been completed for the inauguration of a student Health Service at the College, and for a more complete organization of student activities. Upon petition of the Student Body, the Board of Regents of the College at the meeting held on January 5, 1916, increased the student-body, or incidental, fee from \$2.50 to \$5.00 each semester. The payment of this fee entitles students to all the privileges of the Health Service, subscription to the Barometer (the student semi-weekly publication), and to free admission to such student contests and entertainments as all athletic games on the campus, oratorical and debating contests, and the entertainments of the lyceum course. Details concerning the health service will be announced before the opening of the College, September 18, 1916, after the arrival of Mr. Wendell J. Phillips who has been employed as Medical Adviser.

STUDENT EXPENSES

GENERAL FEES

Tuition is free to all students, regardless of the place of residence. The regular College fees, required of all students, with the exception of special students in music who take no other College work, are as follows:

Entrance fee, payable annually on registration.....\$5.00

Courses 537, 538..... 1.00

LABORATORY FEES AND DEPOSITS

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		Fees	Dep.
Bacteriology:			
Courses 102, 203, 204, 302, 406, 701.....		2.00	
Courses 101, 201, 202, 205, 300, 301, 401, 501, 502		3.00	
Courses 111, 112, 116.....		4.00	
Chemistry:			
All Laboratory Courses			
Fees.....	One dollar per credit hour		
Deposits.....	Two dollars per course		
Commerce:			
Courses B, C, 100, 101, 102, 103, 107, 404, 405, 413		1.00	
Courses 400, 401, 402, 403, 410, 411, 412,.....		2.00	
Dairy Husbandry:			
Courses 1, 6, A. P.		1.00	2.00
Courses 3, 7, B, D.....		1.00	.25
Courses C, 4.....			.25
Domestic Art:			
Courses 101, 102, 201, 202, 203, 204, 501, 502, 601, K, L, N.....		.50	
Courses 301, 701.....		1.00	
Courses 401, 404.....		4.00	
Domestic Science:			
Courses K, 510 .....		.50	
Course 120		1.00	
Course M, 190, 191, 202.....		2.00	
Course 180		2.50	
Courses C, D, 101, 102, 103.....		3.00	
Courses 104, 105.....		3.50	
Course 201		4.00	
Courses H. I.....		6.00	
Drainage and Irrigation:			
Courses A, B.....		1.00	
Courses 1, 2.....		1.00	1.00
Courses 3, 4, 8, 11.....		.50	1.00

Engineering:	Fees	Dep.
Civil		
Courses 107, 111, 511.....	.50	
Courses 222, 223, 225, 232, 233, 242, 243, 252, 254, 272, 274, 513, 514, 515, 516, 555, 557.....	1.00	
Electrical		
Courses 201, 202, 203, 204, 403.....	2.50	3.00
Experimental		
Courses 210, 238, 255, 262, 265, 272.....	2.00	
Courses 201, 202, 203, 204, 205, 206, 207, 208, 231, 232, 233, 235, 240.....	3.00	
Courses 291, 292 arranged according to work undertaken.		
Irrigation		
Courses 204, 303, 402, 501, 701, 802.....	1.00	
Mechanical		
Course 316 .....	.75	
Mining		
Courses 135, 138, 161, 171.....	1.00	
Courses 111, 112.....	3.00	
Course 401	7.50	
Courses 212, 323		2.00
Courses 301, 324, 330, 423.....		5.00
Entomology:		
Courses 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312.....	1.00	
Farm Management:		
Courses 2, 11.....	1.00	
Course 1.....	.50	
Farm Mechanics:		
Courses 1, 5.....	1.50	1.00
Courses 2, 3, 11.....	2.00	1.00
Course 4.....	1.00	1.00
Field Crops:		
Courses 101, 103, 104, 105, 106, 107, 109, 111.....	.50	
Forestry:		
Courses C, D, E, F, 201, 202, 203, 204, 506.....	1.00	
Courses 302, 304, 305, 503, 504, 601, 603, 607.....	1.50	
Courses 301, 303, 501, 502.....	2.00	

Horticulture:		Fees	Dep.
Course 123 .....		.50	
Courses 101, 103, 104, 105, 201, 401.....		1.00	
Course 125		3.00	
Soils:			
Courses A, 4.....		1.00	1.00
Courses 1, 2, 3, 5, 11.....		1.00	2.00
Courses 6, 8.....		.50	
Industrial Arts:			
Courses 106, 133, 202		1.50	2.00
Courses 152, 153		1.50	
Courses G, 105, 110, 111, 112, 113, 116, 131, 132, 134, 137, 203, 206, 207, 208, 209, 212, 213.....		3.00	2.00
Courses L, 151, 154, 155, 156, 158, 171, 173, 175, 230, 270		3.00	
Courses C1, C2, C3, D1, D2, D3, E1, E2, E3, F1, F2, F3, T1, T2, T3, U1, U2, U3.....		6.00	2.00
Courses J1, J2, J3, K1, K2, K3, M1, M2, M3, N1, N2, N3, P1, P2, P3, Q1, Q2, Q3.....		6.00	
Courses 103, 104, 135, 136, 205.....		4.50	2.00
Course 174		4.50	
Industrial Education:			
Course 165.....		1.50	
Course 164 .....		.50	
Pharmacy:			
Courses 130, 131, 140, 141, 230, 231, 240, 241.....		1.00	
Courses 118, 151, 170, 218, 251, 270.....		6.00	1.00
Courses 121, 221		3.00	
Courses 160, 161		3.50	
Physical Education:			
All courses		1.50	
(All students using the Gymnasium pay the fee of \$1.50 per semester, for which they are given use of all equipment, baths, and are furnished with towels, soap, and medical supplies for injuries.)			
Physics:			
All courses		2.00	

Poultry Husbandry:		Fees	Dep.
Courses 1, 2, A, B.....		1.00	1.00
Course 6			1.00
Veterinary Medicine:			
Courses 3, 4, 11, 14, C, B.....		.50	
Courses 2, 5, 6.....		1.00	
Course 1		2.00	
Zoology:			
Courses 101, 102, 103, 108, 109, 114, 115, 116, 201, 202, 204, 207, 208, 211.....		1.50	1.00
Courses 104, 105		2.00	3.00
Courses 110, 111		1.00	1.00
Courses 112, 113, 205, 209.....			3.00
Courses 106, 107, 120.....		.25	

BOARD AND ROOM

Women's Dormitories. Waldo Hall and Cauthorn Hall, with their large airy parlors and halls, are pleasant residences for the young women who come from distant homes. The buildings are supplied throughout with pure mountain water, both hot and cold, electric lights, steam heat, and all modern conveniences. The rooms are furnished with an iron bedstead, a mattress, a chiffonier, a table, and chairs. Such other materials as are needed to make the furnishings complete, including pillows, pillow cases, sheets, blankets, bedspread, and towels, are furnished by the student; and many of the students prefer to make the rooms more homelike by bringing rugs, curtains, pictures, sofa cushions, etc. These latter articles, however, are not at all necessary. The rooms are cheerful and comfortable without additional furniture. The bedrooms average about 12 feet by 15 feet, with one window 3 feet by 7 feet. Many of the rooms are larger, and a few of them have two windows. Most rooms are furnished with single beds, but a few double ones are available. There are a limited number of single rooms in each hall. Preference for single rooms should be indicated early. The many advantages of having a roommate should not be overlooked by the student in making her plans for college life.

The conditions of living in Waldo Hall and Cauthorn Hall are such that the College considers it a distinct advantage to the

women students to live in these halls of residence. A wholesome, busy student atmosphere is maintained. Reasonable freedom is allowed, but week nights are reserved for study. All girls entering the College are expected to live in one of the dormitories, unless their parents reside in the city, or they are given special permission from the Dean of Women to live elsewhere. This permission must be obtained from the Dean of Women previous to registration.

The expenses of living for each student in the dormitories are as follows:

Room deposit.....	\$ 3.00
Room rent for each semester—	
Single room	20.00
Double room	10.00
Board per week, payable monthly in advance	3.50
Incidentals, such as laundry fee, electric iron fee, etc., for each semester.....	2.00

The room deposit of \$3.00 must be sent to the Registrar at the time of application for a room. When the student withdraws from College, this deposit will be refunded, upon presentation of the receipt, if no damage has been done to the room or furnishings.

Women students are not expected to arrive in Corvallis until the day the Halls are opened.

The dormitories will open for students September 17, 1916, one day preceding the first registration day.

Private Board for Men Students. No dormitory accommodations are available for men students. Board and room may be secured in private families in the city of Corvallis for from \$4.00 to \$5.50 per week. Good accommodations for self-boarding, or for club-boarding, can also be secured in the city. By clubbing, or renting rooms and boarding themselves, students materially reduce the cost of living. Students, however, will not be permitted to live at places not approved by the Faculty.

Lists of private boarding places can be secured from the Secretary of the Y. M. C. A. after the student arrives at the College.

PERSONAL EXPENSES.

The personal expenses of students vary. Many students are able to go through the college year on a comparatively small income.

Questions of personal thrift, discrimination in values, and established habits are determining factors here. Each man, immediately upon registration, is required to supply himself with a military uniform, the cost of which will be approximately as follows: Suit and cap, \$11; leggins, 90c; hat band and breast cord, \$1.15; collar ornaments, 25c; gloves, 40c a pair; total, \$13.70. Tan shoes (the regulation style, costing \$3.75) and a drab shirt (costing \$2.00) are appropriate elements of the uniform. The uniform is very serviceable and is more economical than civilian clothing; with reasonable care, it should serve for two or more years.

In physical education women are required to provide themselves with a gymnasium suit, consisting of blouse-waist and bloomers of regulation style, and with regulation gymnasium shoes. Good second-hand uniforms of outgoing girls will be on sale for about \$4.00, while new uniforms cost \$5.00. These suits should be ordered at the gymnasium office at the time of registration.

Men in physical education are expected to supply themselves with a gymnasium suit and the regulation gymnasium shoes. The cost of the gymnasium uniform complete, including shoes, need not exceed \$2.75.

COST OF A YEAR IN COLLEGE

One of the most perplexing questions that confronts a prospective student is what the course is going to cost him a year. The necessary cost of a year at the College will vary slightly with the particular course pursued by the student. In general, it may be said that the necessary cost per annum averages about \$224. An estimate of this average cost for the main expense items is given below. The cost for room and board is estimated at a safe average price. The board and room items are sometimes slightly reduced, where two students occupy the same room or where boarding clubs are economically managed.

Registration fee	\$ 5.00
Incidental (Student) fee	5.00
Laboratory fees and deposits	18.00
Textbooks and supplies	26.00
Board (for eight months)	*120.00
Room rent (nine months)	30.00

*On account of Christmas and other vacations which most students spend at home, the cost of board is estimated for eight months only.

In addition to the above, would be the cost to men of the military uniform and the regulation gymnasium suit, and to women of the gymnasium suit and shoes. Uniforms, however, as already indicated, should serve for more than one year. Personal expenses such as clothing, railroad fare, laundry, etc., vary greatly with the individual.

It is not recommended that any student come to the College without sufficient funds available to purchase his books and college stationery for the entire semester, pay his first month's board and room rent in advance, and pay his first semester entrance fees. For the average student, this initial outlay will be approximately \$70.00, the balance of the annual expenses being distributed about evenly throughout the remaining months of the school year.

Persons desiring more detailed information on the question of expenses for students in various departments should write to the Registrar, Corvallis, Oregon, for a bulletin on "Student Expenses."

SELF-SUPPORT

A considerable number of students manage, in one way or another, to earn the whole or a part of their expenses while attending the College. Such opportunities occur in the line of office and laboratory assistance, personal services of numerous kinds, the management of various student enterprises, agencies for laundries, etc.

The Student Employment Bureau, in charge of the Young Men's and Young Women's Christian Associations, registers without charge all students who apply for employment. It is the purpose of the Bureau to try to supply work, regular or occasional, to all who need it. In general, the demand for work on the part of students exceeds the supply that the Bureau has available; therefore the attention of new students who intend to earn the whole or part of their living is called to the following results of past experience.

1. The applications received during summer will be given first attention; it is therefore important to apply early.

2. There is a constant over-supply of those wishing to do teaching and clerical work. None but those having superior qualifications and experience are likely to secure employment the first semester.

3. There is a considerable demand for efficient stenographers; also for men and especially women students who can do domestic labor of any kind; board and room rent may be earned by table service, dish washing, general housework, house cleaning, gardening, etc.

4. Students who can do any kind of domestic or manual labor well, and who have thoroughly good health, can earn their board by three hours' work a day, or board and room by four hours' work a day. But no student should come to the College without resources sufficient for the expenses of one semester. (See "Personal Expenses.") Work of any kind is much more readily secured after the student has had opportunity of becoming familiar with local conditions.

5. No Student should come expecting to earn money, who can do nothing well; skill is essential, as competition is quite as severe in the College community as elsewhere.

6. Opportunities for earning money during the summer vacations can usually be counted on, the demand for forest rangers, for field workers in engineering and mining, for skilled workmen in engineering shops, factories, canneries, and hop-yards, and for horticultural, farm, and forestry laborers, being most constant.

Upon arrival at the College, new students should report for information to the Information Bureau of the Young Men's and Young Women's Christian Associations.

Women students desiring work in the Dormitories should apply early to the Housekeeper of the Women's Dormitories.

The Dean of Women, will be very glad to give any information to parents and prospective students about the work of the women at the College at any time. Office, Room 107 Home Economics Building.

STUDENT LOAN FUND

Through the liberality of friends of the Oregon Agricultural College, and through the accumulation of interest on loans, an irreducible student loan fund aggregating \$4,621.05 (August 1, 1915), has been established. The purpose, as expressed by one of the donors, is "not to induce students to attend school by providing money that can be easily obtained, but rather to aid those who have determined to secure an education and are paying the cost wholly or in part from their own earnings."

The fund consists of the following contributions:

1. One thousand dollars (\$1,000) from Hon. R. A. Booth of Eugene, restricted to students studying:

(a) Agriculture in its various phases, with a view to becoming producers from the soil.

(b) Such branches of mechanics as properly relate to agriculture.

(c) Home Economics.

2. Five hundred dollars (\$500) known as the Ashby Pierce Student Loan Fund.

3. Three thousand one hundred and twenty-one dollars and five cents (\$3121.05), without restriction, from accumulated interest and from various College organizations, such as Folk Club, Philadelphian and Feronian Literary societies, the Barometer, the Oregon Countryman, the Cosmopolitan Club, the Faculty, the Christian Associations, the Winter Short Course students of 1914, the Graduating Class of 1915, Chapter A. of P. E. O., Portland, and by various individuals including Mrs. Clara H. Waldo, Portland, and Hon. Thomas Kay, Salem.

PRIZE FUND

The Clara H. Waldo Prize of one hundred dollars is an award annually made in the proportions of forty, thirty, twenty, and ten dollars respectively, to the woman of highest standing registered as a regular student in one of the degree courses in the senior, junior, sophomore, and freshman year. In the distribution of the prizes, the committee having charge of the awards is guided by the following points:

(a) Proficiency in literary and scholastic attainments.

(b) Success in student activities.

(c) Qualities of womanhood.

(d) Qualities of leadership.

ADMISSION TO THE COLLEGE.

A student who wishes to be admitted to the Oregon Agricultural College may do so in one of two ways: (1) by examination, (2) by certificate.

Students who seek admission by examination must present themselves for examination at the College on registration days, September 18 and 19.

Students who seek admission by certificate may do so in one of the following ways:

For Admission to the Vocational Courses. By presenting properly certified evidence of the completion of the equivalent of an eighth-grade course of study in the public schools, and by meeting the other requirements for admission specified in the paragraph on Vocational Courses, under Entrance Requirements.

For Admission to the Degree Courses. By presenting properly certified evidence of the completion of four years of the course of study (15 units) in an accredited or standard high school, and by meeting the other requirements for admission specified in the paragraph on Degree Courses, under Entrance Requirements.

For Admission as a Special Student. By presenting properly certified evidence of suitable preparation for the studies desired, and by meeting the other requirements specified under Special Students.

For Admission as an Optional Student. By presenting properly certified evidence of meeting all the regular entrance requirements, and by meeting the other requirements specified under Optional Students.

For Admission to Advanced Standing. By presenting properly certified evidence of the completion, in other institutions of recognized standing, of such work as is equivalent to corresponding work required in the College courses, and by meeting the other requirements specified under Advanced Standing.

For Admission to Graduate Study. By presenting properly certified evidence of graduation from this or other educational institutions of equal rank, and by meeting the other requirements for admission specified under Graduate Study.

ENTRANCE REQUIREMENTS

Vocational Courses

For admission to the vocational courses in Agriculture, Dairying, Forestry, Home Economics, and Commerce, applicants must be at least 18 years of age, and in addition to having completed the eighth-grade course of study, or its equivalent, must be of good moral character. For admission to the vocational course in Mechanic Arts, applicants must be at least 16 years of age, and in addition to having completed the eighth-grade course of study, or its equivalent, must be of good moral character. Applicants who

have not completed the eighth-grade course of study, but who are 21 years of age or over, and of good moral character, may be admitted to any of these vocational courses at the discretion of the dean of the school in which the work is to be carried on. For admission to the vocational course in Pharmacy, applicants must be at least 18 years of age, and in addition to having completed two years of high-school work, or its equivalent, must be of good moral character. For a statement of the length and character of the vocational courses, see index on Courses of Study.

Degree Courses

Applicants for admission to the degree courses must be 16 years of age or over and of good moral character. The fifteen units required for entrance, distributed in the most advantageous way for admission to the various College courses in Agriculture, Home Economics, Forestry, Engineering, Mining, Industrial Arts, Commerce, and Pharmacy, are indicated in the table entitled "Prescribed Units for Admission." If the distribution of units presented by the matriculate does not correspond to that recommended, as indicated by the table, the student will be required to carry in College the courses lacking in his secondary credits, in order to make up his deficiency.

A unit, as referred to in the table, implies one high-school subject carried for five 45-minute periods a week throughout the school year.

Prescribed Units for Admission	Agriculture	Home Economics	For. & Log. Engineering	Engineering*	Commerce	Pharmacy
English	3	3	3	3	3	3
Mathematics—						
Algebra	1	1	1½	1½	1	1
Plane Geometry	1	1	1	1	1	1
Solid Geometry	0	0	0	½	0	0
Electives	10	10	9½	9**	10	10
Total units	15	15	15	15	15	15

*Includes Mining and Industrial Arts.

**It is suggested that while physics is not prescribed as an entrance requirement in Engineering, students who are preparing to enter any of the Engineering courses take a year's work in high-school physics where this work is available.

The electives listed in the table may be selected from any of the subjects offered in the "Oregon Course of Study" for high schools.

While History and Foreign Languages are not prescribed by the College as entrance requirements, students are urged to pursue these subjects in the high school. For credit involved in this work, see Advanced Standing.

To be admitted as a conditioned freshman, a student must not lack more than two of the total number of entrance units.

In English. Admission to the English courses of the freshman year is by certification from accredited secondary schools. When an applicant cannot furnish such certification, his admission to the freshman courses is conditioned on his passing an examination in essentially the following tests:

1. To test his power of written expression, he will write one or more compositions on a subject, or on subjects, suggested by his personal, school, community, or literary interests.

2. To test his power of oral expression, he will read at sight, in the presence of the Examiner, passages of prose, or of poetry, or both, with accuracy and effectiveness. He will also be expected to talk intelligently in good English, on some assigned subject adapted to his ability.

3. To test the range and character of his reading, and his power of appreciation, he will be expected to answer a number of simple questions on standard classics and contemporary literature not previously prescribed. He will also be expected to explain the meaning of several passages of prose and of poetry of moderate difficulty, selected from books not previously prescribed.

Whether the applicant be admitted by certification or by examination, the English department will, whenever it deems such a course advisable, deal with the student as in a probationary relation.

In case the work of such student should, at the expiration of thirty days after matriculation, fail to conform to the standard set for creditable freshman work, he may be required to make up his deficiencies in English.

Candidates presenting exercise books containing compositions or other written work properly certified to by the instructor, will be given credit for such work.

In Mathematics. The entrance requirements in Mathematics for students entering any of the degree courses in College; namely, one unit in Algebra and one unit in Plane Geometry, will be satisfied by the applicant's ability to pass a satisfactory examination in the following topics:

(a) In Algebra, addition, subtraction, multiplication, and division of positive and negative numbers; use of parentheses, factoring, highest common factor, lowest common multiple, fractions, fractional and literal equations, simultaneous equations, problems involving linear equations with one or more unknown numbers, graphical representation of simultaneous linear and quadratic equations, involution, evolution, theory of exponents, radical expressions.

(b) In Plane Geometry, the five books of Wentworth's Plane Geometry, or any other standard text on the subject. That the student may be trained to think for himself and not be dependent upon the published proofs of the text, much importance is based upon the proving of original exercises. It is distinctly advised that students preparing for entrance examination in Geometry devote considerable time to the study of original exercises.

The entrance requirements in Mathematics for students in the schools of Forestry, Engineering, and Mining demand an additional semester's work in Algebra, including quadratic equations, problems involving quadratic equations with one unknown number, equations in the quadratic form, factoring of quadratic equations, solution of quadratic equations by factoring, simultaneous quadratic equations, problems involving simultaneous quadratic equations with two unknown numbers.

The entrance requirements in the School of Engineering demand also, in addition to the specifications above, one semester's work in Solid Geometry, such as that presented in Wentworth's Solid Geometry, or any other standard text on the subject.

ACCREDITED SCHOOLS

Pending the preparation of a classified list of high schools by the Oregon State Department of Public Instruction, students who have completed four years of high-school work will be admitted to the degree courses on presentation of a signed statement of the principal, showing work completed. It is recommended that the Certificate of Record blank issued by the Oregon Agricultural

College, be used. Copies will be sent by the Registrar on the application of either student or principal. These blanks must be filled out and signed by the principal or other authorized official of the school. The certificate, so authenticated, should be filed with the Registrar of the College on or before September 12, 1916. Certificates will not be rejected at a later date but acknowledgment of the receipt of such certificate will be made by the Registrar up to and including September 12 only. Students sending certificates at a later date will likely be delayed in completing registration.

SPECIAL STUDENTS

Students who have presented satisfactory evidence of suitable preparation for the studies they desire, who are 18 years of age, and of good moral character, may be admitted as special students, provided they have never applied for admission and been rejected.

Special students may be allowed to graduate in any of the courses, on condition that they complete the required work.

Special students are expected to select their studies from courses open to freshmen. If they desire to take studies to which only advanced students are regularly admitted, they must show some special preparation or special necessity for such courses.

Candidates applying for admission on the above basis should file with the Registrar before September 12, 1916, a detailed statement of their preparatory work.

OPTIONAL STUDENTS

Students who have presented satisfactory evidence of meeting all the entrance requirements for the freshman class, who are of mature years and of good moral character, may be admitted as optional students, provided they furnish satisfactory evidence that they are unable, because of poor health, or outside business, or professional duties, to take a full course. They should file with the Registrar, before September 12, 1916, a certified statement of all preparatory work.

ADVANCED STANDING

Students matriculating in the degree courses with more than the number of credits required for entrance to the freshman class, will be given advanced standing for such credits as represent work

beyond the full four years high-school course and are equivalent to the requirements of the course in which the student matriculates.

No credit will be allowed for any Science or Foreign Language carried for less than one full year.

ADMISSION FROM OTHER COLLEGES

Any student who has attended another college or university and desires to enter the Oregon Agricultural College, should file with the Registrar, on or before September 12, 1916, an official certificate from the college from which he wishes to transfer, giving evidence of: (1) his honorable dismissal; (2) a detailed statement of the entrance credits presented at the time of his matriculation at the other college; (3) a detailed statement of the work pursued while in attendance at that college; and (4) a marked copy of the catalogue of the institution, showing by conspicuous markings the courses which he completed.

REGISTRATION

All candidates for admission should file with the Registrar a certificate of their preparatory record on or before September 12, 1916. Certificates of preparatory work will not be rejected at a later date, but applicants cannot expect to receive formal acknowledgement of their receipt by the Registrar. Applicants sending in their certificates late may be delayed at registration time. Blank forms for such records may be secured from the Registrar. Such candidates should present themselves for registration at the College on September 18 or 19, 1916. Registration at a later date will be permitted only on presentation of a satisfactory reason for the delay.

Students who have not before registered at the College are advised to reach Corvallis not later than September 16, 1916, in order that they may secure a boarding and rooming place before the first day of registration.

GRADUATION

The degree of Bachelor of Science in Agriculture, in Forestry, in Logging Engineering, in Home Economics, in Civil Engineering, in Electrical Engineering, in Irrigation Engineering, in Highway

Engineering, in Mechanical Engineering, in Mining Engineering, in Ceramics, in Chemical Engineering, in Commerce, in Pharmacy, and in Industrial Arts, is conferred upon those who have satisfactorily completed the respective four-years courses which in the aggregate comprise 136 credits of College work. A graduate in any of the courses may receive the bachelor's degree in any other course by completing the studies required in that course.

The degree of Graduate in Pharmacy is granted to those students in Pharmacy who complete specified work meeting the requirements of the American Conference of Pharmaceutical Faculties.

A certificate will be granted those students who complete the Vocational Course in Agriculture, Dairying, Home Economics, Mechanical Arts, Commerce, or Pharmacy.

GRADUATE STUDY

The Oregon Agricultural College offers to its graduates and to those of other institutions of equal rank, work in Agriculture, Home Economics, and Pharmacy leading to the degree of Master of Science, and work in Engineering, Mining, and Forestry, leading to the usual professional degrees.

This work is done in the several departments of the College under the general supervision of a standing committee of the Faculty known as the committee on "Graduate Students and Advanced Degrees."

REQUIREMENTS FOR THE HIGHER DEGREES

Candidates for any one of the higher degrees will be required to complete a certain minimum of resident work, to prepare a suitable thesis, and to pass an oral examination.

The resident work is planned so that it may be completed in a single year by a student who devotes full time to his studies; it consists of a minimum of 32 credits, including the preparation of the thesis. Graduate credit from other institutions will not be accepted as reducing this minimum of 32 credits. One credit requires approximately three hours of the student's time each week for one semester. From 16 to 24 of these credits will be devoted to the thesis and to allied subjects in the same department, and will constitute the candidate's major. From 8 to 16 of these 32 credits will be selected from other departments of the College

and will constitute the minor. Undergraduate work may, at the discretion of the committee, be taken as part of the minor, but when so taken, the number of credits allowed for any course will be reduced to two-thirds of the number listed in the catalogue, the assumption being that the candidate can, in work of that grade, accomplish as much in two hours as the average undergraduate in three. No course which is contained in the curriculum of any high school of the State of Oregon, nor any course regularly covered in the Freshman and Sophomore years of this College shall be allowed as credit toward an advanced degree; and no credit shall be allowed toward the major for any regular undergraduate course. All graduate students taking regularly announced courses must attend the examinations given as part of such courses.

The thesis must embody the results of investigative, though not necessarily original, research, and a typewritten copy of the thesis, prepared according to the specifications of the committee, must be deposited with the chairman of the committee not later than two weeks prior to the date set for commencement of the year in which the degree is desired.

After the thesis has been deposited, the chairman will appoint a special examining committee and set a date for the oral examination. This special committee will consist of: (1) the one or more professors in charge of the major; (2) the one or more professors in charge of the minor; and (3) one or more members of the Committee on Graduate Students and Advanced Degrees. The report of this committee will be presented to the College Council by the chairman of the Committee on Graduate Students and Advanced Degrees. The chairman will deposit the thesis of successful students with the Librarian as soon as possible after the oral examination.

Higher degrees will be conferred only at the regular commencement exercises, but the committee many under exceptional circumstances allow the candidate to be absent from such exercises.

ADMISSION TO THE COLLEGE AS A GRADUATE STUDENT

All students who have been graduated from four-years' courses in the Oregon Agricultural College or in other colleges of equal rank, will be considered graduate students and will be registered as such by the Registrar. Graduate students will be required to

present credentials to the Registrar as specified under "Admission from Other Colleges."

FEES

Graduate students will pay the same entrance, incidental, diploma, and binding fees as undergraduates. Laboratory fees will in each case be determined by the head of the department concerned, and must be paid at the beginning of the semester in which the laboratory work is done.

OUTLINE OF COURSES OF STUDY

The Oregon Agricultural College offers the following courses of study, each of which extends over four years and leads to the degree of Bachelor of Science:

(Arranged alphabetically by schools and departments.)

In the **School of Agriculture**, major courses in—

- | | |
|--------------------------------|-------------------------------|
| (a) Agriculture (general) | (i) Entomology |
| (b) Agriculture for Teachers | (j) Farm Crops |
| (c) Agricultural Chemistry | (k) Farm Mechanics |
| (d) Animal Husbandry | (l) Horticulture |
| (e) Bacteriology | (m) Poultry Husbandry |
| (f) Botany and Plant Pathology | (n) Soils and Farm Management |
| (g) Dairy Husbandry | (o) Veterinary Medicine |
| (h) Drainage and Irrigation | (p) Zoology |

In the **School of Commerce**, major courses in—

- | | |
|-----------------------------|---------------------------------|
| (a) Business Administration | (c) Political Science |
| (b) Economics | (d) Stenography and Off. Train. |

In the **School of Engineering**, major courses in—

- | | |
|----------------------------|----------------------------|
| (a) Civil Engineering* | (d) Industrial Arts |
| (b) Electrical Engineering | (e) Irrigation Engineering |
| (c) Highway Engineering | (f) Mechanical Engineering |

In the **School of Forestry**, major courses in—

- | | |
|----------------------|-------------------------|
| (a) General Forestry | (b) Logging Engineering |
|----------------------|-------------------------|

In the **School of Home Economics**, major courses in—

- | | |
|----------------------|------------------------------|
| (a) Domestic Art | (c) Home Administration |
| (b) Domestic Science | (d) Institutional Management |

In the **School of Mines**, major courses in—

- | | |
|--------------------------|------------------------|
| (a) Ceramic Engineering | (c) Mining Engineering |
| (b) Chemical Engineering | |

In the department of **Pharmacy**, a course in—

- (a) Pharmacy

In addition to the above baccalaureate courses, provision has been made for the following:

1. A two-years course in Pharmacy leading to the degree of Ph. G., and
2. Vocational courses, varying in length from 6 months to three years, as follows:
 - A. Agriculture (one year).
 - B. Business Short Course (two years).
 - C. Dairying (one year).
 - D. Forestry (November 6 to April 13).
 - E. Home Makers' Course (one year).
 - F. Mechanic Arts (three years).
 - G. Pharmacy (two years, following two years of high-school training).

*No work below Senior grade will be given in Civil Engineering during the year 1916-17.

SCHOOLS AND DEPARTMENTS

SCHOOL OF AGRICULTURE

ARTHUR BURTON CORDLEY, Dean

The School of Agriculture offers the following courses of study: a one-year course in General Agriculture; a one-year course in Dairying; a four-weeks winter course in Farm Crops, Animal Husbandry, Dairy Husbandry, Horticulture, and Poultry Husbandry (known as the Winter Short Course); and a four-years course, with various options, which leads to the degree of Bachelor of Science.

Vocational Courses. The one-year vocational courses are not preparatory or elementary courses. They are provided especially for those who desire to obtain as quickly as possible a working knowledge of the principles of agricultural practice. They are open to young men with or without high-school preparation, and to men of mature years and practical experience, who may desire to familiarize themselves with the most modern thought on this subject. Those who pursue the one-year course in Agriculture will have the opportunity of specializing in general farm practice, live-stock husbandry, horticulture, or poultry husbandry; and those who pursue the one-year course in Dairying will have the opportunity of specializing in Dairy Production or Dairy Manufacturing.

In this State there are thousands of young men who are to become our future farmers and orchardists. It is to the interest both of the individual and of the State that these young men should keep pace with the rapid development of agriculture. Each and every one should have, if possible, the opportunity of obtaining an agricultural education. Many of these young men are so situated, however, that it is impossible for them to attend any of our regular four-years courses. There are also many mature men well past the usual school age, no doubt, who desire to acquaint themselves more fully with the more recent developments in agricultural science and practice. It is to meet the needs of such men, both young and old, that these one-year courses are offered. They are designed to provide the largest amount of practical information and training that can be given in one year.

The Degree Courses. The various degree courses in Agriculture are open only to those who have completed the equivalent

of four years of the Oregon State high-school course (see Admission to the College). The aim of these courses is to train young men to become successful farmers, stockmen, and fruit growers; to equip them to become efficient managers of orchard and ranch properties and of agricultural cooperative organizations; to prepare them to become specialists in some branch of agricultural college or experiment station work, or to fit them to become teachers of agriculture in the public schools. In short, they offer to those who have faith in the farm and in rural life, opportunities for individual development and technical training equal to those provided for the educated in other professions.

The various subjects of instruction may be conveniently arranged into three groups, as follows:

(a) **Sciences related to Agriculture;** i. e., Botany, Zoology, and Entomology; Chemistry, Physics, and Bacteriology; (b) **Technical Agricultural subjects:** Farm Crops, Soils and Farm Management, Farm Mechanics, Rural Architecture, Irrigation and Drainage, Animal Husbandry, Dairy Husbandry, Horticulture, Poultry Husbandry, Veterinary Medicine; (c) **Non-technical subjects:** i. e., English Language and Literature, Modern Languages, Political Science, Rural Economics, Rural Sociology, and similar subjects.

The subjects of the first group are designed to furnish the student with an insight into the principles of agricultural science. Those of the second group teach him the application of these principles and give him also, both theoretically and practically, various subjects of agricultural technology. The subjects of the third group tend further to develop the student's intellect, broaden his view, and train him in good citizenship.

To indicate briefly the nature of the work, it may be stated that the student studies the origin, structure, fertility, cultivation, and improvement of various soils; the history, growth, culture, improvement, and value of the different field crops; the structures, machinery, drainage, and irrigation of the farm; and the history, economics, methods, and business principles in farm management. Thorough courses in Business Administration, Rural Economics and Sociology, and Political Science for Agricultural students, are given by the School of Commerce. In the course in Animal Husbandry, consideration is given to the history and characteristics of the various breeds of live stock; the principles of breeding; the principles and practice of feeding, with particular reference

to conditions in this State. By constant practice in stock judging, the student is made familiar with the good points of the various breeds. In Horticulture the student studies the problems of the orchard and garden, such as choice of sites, soils, planting, pruning, choice of varieties, sprays and spraying, and thinning; he obtains instruction and practice in the propagation of plants by various methods; in the harvesting, picking, storage, and marketing of fruits; he may study the principles of plant breeding, or the construction and management of greenhouses, or the culture of small fruits and vegetables for market or canning purposes. In Dairy Husbandry he studies the secretion, composition, and separation of milk and cream; and obtains abundant practice in the use of the Babcock and other tests, in butter and cheesemaking, and in creamery practice. A department of Poultry Husbandry offers to students exceptional opportunities to specialize in this line. The instruction will include a study of breeds, the principles of feeding, housing, and incubation, and will be supplemented by practical work on the farm. In Veterinary Medicine the student is taught to prevent disease, diagnose existing pathological conditions, arrest outbreaks of contagious and infectious diseases among domestic animals, give medical attention in emergency cases, and take care of the sick.

In response to the demand for special teachers of Agriculture in the high schools, an opportunity is given students to major in agricultural education. Certain courses are prescribed in the junior and senior years to broaden the general agricultural training of the first two years, so that the teacher may be prepared to meet the conditions in any section of the State. Courses in Pedagogy provide the necessary principles and methods of teaching. Some election is also allowed in order that the student may specialize along the lines of his greatest interest.

Candidates for the degree of Bachelor of Science in Agriculture will pursue one of the two prescribed courses during the first two years.

Group I. (See page 77) describes the more work in technical Agricultural subjects and leads to the more advanced work in the Departments of Animal Husbandry, Dairy Husbandry, Drainage and Irrigation, Farm Crops, Soils, and Farm Management, Farm Mechanics, Horticulture, Poultry Husbandry, and Rural Architecture.

Group II. (See page 79) prescribes the more work in Modern Languages and science and prepares especially for the more advanced work in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology.

During the two remaining years of his course, each student is given the opportunity to specialize by electing major work in some one department. For graduation sixty-six credits are required in addition to the freshman and sophomore work. Junior and senior courses other than those prescribed must be selected with the approval of the head of the department in which the major is taken.*

Students who prefer not to specialize, may, with the approval of the Dean, pursue a course in General Agriculture with a wide range of electives. Junior and senior courses aggregating not less than twenty-four credits are required in the School of Agriculture. The remaining courses may be taken in any of the schools or departments of the College.

Practical Experience Required For Graduation

Those students majoring in applied Agriculture will be required to have had a certain amount of practical experience, either before entering the institution or during vacation periods, before being granted a degree. The amount of practice work necessary will be determined in each case by the head of the department in which the student is majoring.

*Major work shall consist of not less than sixteen or more than twenty-four credits in any one department.

VOCATIONAL COURSE IN AGRICULTURE

	Semester	
	1st	2nd
*Elementary Vocational English (Eng. G)	3	
*Advanced Vocational English (Eng. H)		3
Farm Accounting (Com. E)		3
Business and Social Organization (Com. I)	3	
Woodwork (Shop G)	2	
Blacksmithing Shop (Shop L)		2
Farm Soils (Soils A)	3	
Farm Crops (Farm Crops A)		3
Agronomy (Optional)—		
Farm Machines and Engines (Farm Mech. C)	3	
Practical Farm Drainage (Dr. and Irr. A)		2
Irrigation Farming Practice (Dr. and Irr. C)	2	
Animal Husbandry (Optional)—		
Stock Judging (A. H. A)	2	
Feeding and Management (A. H. B)		5
Elements of Stock Feeding (A. H. E)	2	
Diseases of Domestic Animals (V. M. 15)	3	
Horticulture (Optional)—		
Horticultural Practice (Hort. A, B)	5	5
Poultry Husbandry (Optional)—		
Practical Poultry Keeping (P. H. A, B)	5	5
**Drill (Military A, B)	1	1
**Gymnasium (Phys. Ed. 11, 12)	1½	1½

*Students who have a satisfactory knowledge of English may elect an equivalent amount of other work.

**Mature men may be excused from Military Drill and Gymnasium work.

DEGREE COURSES IN AGRICULTURE

Group I.

Freshman Year	Semester	
	1st	2nd
Modern English Prose (Eng. 81, 82)	3	3
General Chemistry (Chem. 100, 101)	3	3
General Physics (Phys. 1)	3	or 3
Agricultural Botany (Bot. 41, 42)	3	3
Crop Production (Farm Crops 1)	3	or 3
Stock Judging (A. H. 1)	2	
*Farm Surveying and Leveling (C. E. 242)	2	
Live Stock Management (A. H. 2)		3
Library Practice (Libr. 1)		½
Hygiene (Phys. Ed. 10)		½
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	½	½
	<hr/> 17½	<hr/> 17½

Sophomore Year (1917-18)

*Farm Accounts and Business Methods (Com. 109).....	2	
Principles of Economic Zoology (Zool. 108, 109).....	3	3
Agricultural Chemistry (Chem. 500, 501)	3	3
Elementary Bacteriology (Bact. 101).....	3	
Principles of Fruit Growing (Hort. 101 A)	2	
Fundamentals of Land. Gard. (Hort. 101 B)	1½	
Vegetable Growing (Hort. 201)		1½
**Soils (1, 2)	3	3
Elements of Dairying (D. H. 1)		3
Practical Poultry Keeping (P. H. 6)		2
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	½	½
	<hr/> 18½	<hr/> 17½

*Students who desire to specialize in the course in Farm Business and Rural Leadership will take Commerce 219 instead of C. E. 242.

**Students who desire to major in Animal Husbandry will take Breeds of Stock instead of Soils, taking Soils courses in the junior year.

	Semester	
	1st	2nd
Sophomore Year 1916-17		
Farm Accts. & Business Methods (Com. 109)	2	
Principles of Economic Zoology (Zool. 108, 109)	3	3
Agricultural Chemistry (Chem. 500, 501)	3	3
Elementary Bacteriology (Bact. 101)	3	
Principles of Fruit Growing (Hort. 101 A)	2	
Fundamentals of Land. Gard. (Hort. 101 B)	1½	
Vegetable Growing (Hort. 201)		1½
Elements of Dairying (D. H. 1)		3
Live Stock Management (A. H. 2)		3
*Farm Surveying and Leveling (C. E. 242)	2	
Practical Poultry Keeping (P. H. 6)		2
Blacksmithing (Ind. Arts 153)	1	
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	½	½
	<hr/>	<hr/>
Junior Year	18½	17½
Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Ins. 1, 2)	1	1
Electives	12	15
	<hr/>	<hr/>
	17	17
Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Electives	13	13
	<hr/>	<hr/>
	16	16

Students majoring in General Agriculture or Agriculture for Teachers will follow Group I, electing not less than four nor more than six credits each semester in the major department. Other subjects must be elected with the approval of the Dean of the School in the case of students in General Agriculture and the Professor of Industrial Education in the case of students in Agriculture for Teachers.

*Students desiring to specialize in the course in Farm Business and Rural Leadership will take Com. 219 instead of C. E. 242.

DEGREE COURSES IN AGRICULTURE

Group II.

Semester

Freshman Year

1st

2nd

Modern English Prose (Eng. 81, 82)	3	3
General Chemistry (Chem. 100, 101)	3	3
General Physics (Phys. 1, 2)	3	3
Principles of Economic Zoology (Zool. 108, 109)	3	3
Modern Language (German, French, first year)	3	3
Library Practice (Libr. 1)		½
Hygiene (Phys. Ed. 10)		½
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	½	½

Sophomore Year (1917-18)

16½

17½

Agricultural Botany (Bot. 41, 42)	3	3
Agricultural Chemistry (Chem. 500, 501)	3	3
Elementary Bacteriology (Bact. 101)	3	
Modern Language (German, French, second year)	3	3
Organic Chemistry (Chem. 201)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	½	½
Electives	5	5

Sophomore Year (1916-17)

Farm Accts. & Business Methods (Com. 109)	2	
Principles of Economic Zoology (Zool. 108, 109)	3	3
Agricultural Chemistry (Chem. 500, 501)	3	3
Elementary Bacteriology (Bact. 101)	3	
Principles of Fruit Growing (Hort. 101 A)	2	
Fundamentals of Land. Gard. (Hort. 101 B)	1½	
Vegetable Growing (Hort. 201)		1½
Elements of Dairying (D. H. 1)		3
Live Stock Management (A. H. 2)		3
*Farm Surveying and Leveling (C. E. 242)	2	
Practical Poultry Keeping (P. H. 6)		2
Blacksmithing (Ind. Arts 153)	1	
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	½	½
	18½	17½

*Students desiring to specialize in the course in Farm Business and Rural Leadership will take Com. 219 instead of C. E. 242.

Junior Year

Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Ins. 1, 2)	1	1
Electives	12	15
	—	—
	17	17

Senior Year

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Electives	13	13
	—	—
	16	16

In the courses in this group students may major in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology. The purpose of these courses is to provide students with preliminary training for agricultural college and experiment station positions in these various sciences; for work in the scientific bureaus of the U. S. Department of Agriculture; for positions as fruit inspectors; and for technical positions in State and government fish and game propagation work.

Students majoring in Agricultural Chemistry will follow Group II, electing not less than five credits each semester in the department of Agricultural Chemistry. Other subjects must be elected with the approval of the head of the department of Agricultural Chemistry.

Students who desire a less technical course may, with the approval of the Dean, substitute elective work for any one of the prescribed courses in each semester of the freshman year. These and other elective courses may be taken in any of the schools or departments of the College, provided only that in addition to the prescribed courses not less than twenty-four credits of junior and senior work must be taken in the School of Agriculture.

ANIMAL HUSBANDRY

ERMINE LAWRENCE POTTER, Professor
CARL NELSON KENNEDY, Assistant Professor
RALPH ELMER REYNOLDS, Assistant Professor (Ext.)
GEORGE ROY SAMSON, Instructor
ORAN MILTON NELSON, Instructor

The course in Animal Husbandry is planned to fit the student for the actual raising of live stock on the farm, so that he may produce the highest grade of stock in the most economical and business-like manner. The student is thoroughly grounded in the underlying principles in order that he may successfully continue his study after leaving school, but the practical details are thoroughly treated and a special effort is made to keep the students in close touch with the financial phases of the industry. Students who take this work as their specialty are expected not to devote their entire time to live stock; but, on the contrary, to familiarize themselves with crop production, soil fertility, and other phases of general agriculture. They are expected also to study English, Economics, Commercial Law, and kindred subjects, all of which are so essential in the training of the young man who expects to become not only an up-to-date business stockman, but a good useful citizen.

Students electing to major in Animal Husbandry must have had considerable practical experience in farming and stock raising before they will be allowed to graduate. The nature and extent of the experience required will be left to the judgment of the head of the department.

Students not majoring in Animal Husbandry but desiring to elect some work in the department, will be given careful attention to see that they get just the work fitted to their individual needs.

Equipment. The equipment of the department of Animal Husbandry consists essentially of live stock, barns, and the College stock farms. During the past year the live stock available for illustration and demonstration purposes has been very much improved in numbers and in quality. The College flocks and herds now include typical specimens of Shorthorn and Hereford cattle, Cotswold and Shropshire sheep, Berkshire, Yorkshire, Poland China, and Duroc Jersey swine, Percheron, Belgian, Clydesdale, Shire, American Saddle, and Standard-bred horses, together with the live stock used in experimental work. In addition to the live

stock regularly kept on the College farm, much good stock is loaned from time to time by the leading breeders of the State. During the winter carload lots illustrating the market classes are brought in for demonstration purposes. The department also possesses abundant maps, charts, lantern slides, stud books, a complete animal husbandry library, and other equipment for the conduct of laboratory, lecture, and recitation work.

COURSES IN ANIMAL HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Commercial Law (Com. 300, 301)	3	3
Animal Chemistry (Chem. 509)	2	
Comparative Anatomy (Vet. Med. 1)	3	
Comparative Physiology (Vet. Med. 2)		3
Soils	3	3
Forage Crops (Farm Crops 9)	2	
Drill (Military 5, 6)	1	1
Principles of Nutrition (A. H. 7)	2	
Feeds and Feeding (A. H. 21)		4
Military Science (Theo. Inst. 1, 2)	1	1
Elective		2
	—	—
	18	17

Senior Year		
National Government (Com. 320)	3	
State and Municipal Govt. (Com. 322)		3
Diseases of Live Stock (Vet. Med. 3, 4)	3	3
Principles of Breeding (A. H. 6)		3
Advanced Stock Judging (A. H. 16)	3	
Seminar (A. H. 18, 19)	1	1
Advanced Live Stock Mgt. (A. H. 110, 120)	3	3
English or similar elective	3	3
	—	—
	16	16

The following courses are offered:

A. Stock Judging. A thorough drill in the judging of beef cattle, sheep, swine, and horses, accompanied by text-book and lecture work on types and breeds of live stock.

Vocational: First semester; 2 credits; 3 laboratory periods.

Fee: \$0.25. Text: Vaughan: Type and Market Classes of Live Stock.

B. Feeding and Management. The practical details of the feeding, care, and management of all kinds of live stock, with special reference to practices common in the Northwest.

Vocational: Second semester; 5 credits; 4 recitations; 1 laboratory period.

Fee: \$1.50. Text: Potter et al: Live Stock Management.

E. Elements of Stock Feeding. The elementary principles of stock feeding, methods of balancing rations, feeding standards, and nutritive ratios.

Vocational: First semester; 2 credits; 2 recitations.

Fee: \$1.50.

1. Stock Judging. The various types of farm animals are studied by score card and comparative methods, and the student made familiar with the desirable and undesirable types of beef and dairy cattle, sheep, swine, and horses.

Agriculture: Freshman year; first semester; 2 credits; 3 laboratory periods.

Fee: \$0.25. Text: Vaughan: Type and Market Classes of Live Stock.

2. Live-Stock Management. Practical details of the care and management of live stock, stabling, grooming, sanitation, practical feeding, and kindred details of live-stock farming, all with especial reference to Oregon conditions.

Agriculture: Sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.50. Text: Live Stock Management.

6. Principles of Breeding. The principles of breeding as related to the development of our domestic animals; variation, transmission of variations and modifications, fecundity, inbreeding, crossing, and like topics.

Prerequisites: Botany 41 and 42; Zoology 108, 109.

Animal Husbandry: Senior year; second semester; 3 credits; 3 recitations.

Text: Walter: Genetics.

7. Animal Nutrition. The chemical and physiological principles of animal nutrition; the function of the various classes of nutrients when taken into the animal body; nutritive ratios; feeding standards; compounding rations; and the general significance of the chemical composition and energy value of feeds.

Prerequisites: Chemistry 500 and 501.

Animal Husbandry: Junior year; second semester; and Dairy Husbandry: First semester; 2 credits; 2 recitations.

Text: Henry & Morrison: Feeds and Feeding.

13. Research Work. The student is expected to select some line for individual investigation, either by library methods or otherwise. The object is: first, to allow the student to study some particular subject in which he is especially interested; and second, to give him training in working out problems for himself, such as he will have to undertake after leaving school. This course is open only to those who are taking Animal Husbandry as their major, or who have taken practically all of the regular courses in Animal Husbandry.

Animal Husbandry: Elective; senior year; first semester; credits and hours to be arranged.

14. Research Work. A continuation of course 13.

Animal Husbandry: Elective; senior year; second semester; credits and hours to be arranged.

16. Advanced Stock Judging. Practical judging of all kinds of live stock, with occasional trips to fairs and stock farms. Judging teams for the Pacific International Stock Show will be chosen for the most part from this class.

Prerequisites: At least four credits of stock judging.

Animal Husbandry: Senior year; first semester; 3 credits; four two-hour laboratory periods.

Fee: \$0.25.

18. Seminar. Weekly meetings in which papers on Animal Husbandry subjects are read and discussed. These papers are prepared under the supervision of the department, although considerable latitude is allowed in the selection of subjects and the manner of presentation.

Animal Husbandry: Junior or senior year; first semester; 1 credit.

19. Seminar. A continuation of course 18.

Animal Husbandry: Second semester; 1 credit.

21. Feeds and Feeding. An advanced course in the feeding of horses, beef cattle, sheep, and swine, consisting of a thorough training in the most approved methods of stock feeding. Especial study is made of the practices of the best stockmen, and of the investigations carried on by the various experiment stations. Students desiring to take only such parts of the course as relate to certain lines of live stock will be permitted to do so by arrangement with the head of the department.

Prerequisite: Animal Husbandry 7.

Animal Husbandry: Senior year; first semester; 5 credits; 5 recitations.

Text: Henry & Morrison: Feeds and Feeding.

23. Feeds and Feeding. A condensed course intended for those students who do not have the time necessary for Courses 7 and 21. While brief, the work is complete in itself and does not depend upon any other course. The feeding of beef cattle, sheep, hogs, and horses is studied with reference to both principles of nutrition and farm practice.

Prerequisite: Animal Husbandry 2.

Elective to juniors and seniors in all agricultural courses except Animal Husbandry; second semester; 3 credits; 3 recitations.

Text: Henry & Morrison: Feeds and Feeding.

24. Pork Production. Feeding and Management of hogs with especial reference to dairy farm conditions.

Prerequisite: Animal Husbandry 7.

Dairy Husbandry Elective: Junior or senior year; second semester; 3 credits; 3 recitations.

101. Live-Stock Practice. Laboratory studies devoted to such work as dipping, dehorning, hoof trimming, shearing, horse training, and other common operations of the stock farm.

Senior Animal Husbandry students only; first semester; 1 credit; 1 three-hour laboratory period.

Note.—The department reserves the right to limit the number of students in this course.

Fee: \$0.50.

102. Live-Stock Practice. A continuation of Course 101.

Animal Husbandry: Second semester; 1 credit; 1 three-hour laboratory period.

Fee: \$0.50.

110. Stock-Farm Management. An advanced course in management dealing particularly with the economic and financial phases of live-stock production.

Animal Husbandry seniors only; second semester; 3 credits; 3 recitations.

210. Types and Breeds of Horses. A study of the leading types and breeds of both light and heavy horses, beginning with the market grades and classes, followed by the breeds. Each breed is studied with reference to its early history, the environment under which developed, the foundation stock, the men who were instrumental in establishing the breed, subsequent development, and present status. Careful consideration is given to the leading families, or strains, and the most prominent animals, both in the country at large and in the Northwest. While the work is not entirely local in its application, especial effort is made to make the students familiar with the herds and the breeders with which they will come in contact when they engage in practical work after graduation. The lecture work is accompanied by comparative judging, in which particular attention is given not merely to the general merits of the animal, but to its conformity to the type or breed in question.

Prerequisite: Animal Husbandry 1.

Animal Husbandry: Junior year; first semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

Fee: \$0.50. Text: Plumb: Types and Breeds of Farm Animals.

220. Types and Breeds of Beef Cattle. A study of the types and breeds of beef cattle as outlined under Course 210.

Prerequisite: Animal Husbandry 1.

Animal Husbandry: Junior year; first semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

Fee: \$0.50. Text: Plumb: Types and Breeds of Farm Animals.

230. Types and Breeds of Sheep. A study of the types and breeds of sheep as outlined under Course 210.

Prerequisite: Animal Husbandry 1.

Animal Husbandry: Junior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

Fee: \$0.50. Text: Plumb: Types and Breeds of Farm Animals.

240. Types and Breeds of Hogs. A study of the types and breeds of hogs as outlined under Course 210.

Prerequisite: Animal Husbandry 1.

Animal Husbandry: Junior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

Fee: \$0.50. Text: Plumb: Types and Breeds of Farm Animals.

300. Pedigree Study. A laboratory study of the blood lines of the various breeds of live stock. Each student is expected to select one or two breeds as the basis for special study rather than to attempt to cover all breeds.

Animal Husbandry: Elective; senior or graduate year; second semester; credits and hours to be arranged.

400. Advanced Hog Feeding. A study of experimental data relating to hog feeding problems.

Animal Husbandry: Elective; graduate year; second semester; 2 credits; hours to be arranged.

411. Graduate Research. Graduate students will be given opportunity to carry on research work along any lines desired. The department is especially well equipped for graduate work along the lines of experimental feeding of hogs, sheep, and beef cattle, live stock management, and all forms of library work with either experiment station or general live-stock literature.

Animal Husbandry: Elective; graduate year; first semester; credits and hours to be arranged.

412. Graduate Research. Continuation of Course 411.

Animal Husbandry: Elective; graduate year; second semester; credits and hours to be arranged.

BACTERIOLOGY

THEODORE DAY BECKWITH, Professor
GODFREY VERNON COPSON, Associate Professor
RALPH McBURNEY, Instructor
_____, Instructor
MARKS HUMBERT MIDDLEKAUF, Instructor

Bacteriology, although comparatively a new field of study, has become an every-day interest and has taken a place deservedly prominent among the sciences. It is essential that every student in Agriculture, Pharmacy, or Home Economics acquire at least a general knowledge of the fundamental principles of bacteriology in order to get a thorough understanding of his work.

Since technical bacteriology is usually a totally unfamiliar field to the new student, the first courses are necessarily general in character, although every effort is made towards direct application whenever possible. The work, therefore, is both theo-

retical and practical. Courses are commenced in the Sophomore year to enable the student to continue along definite specialized lines during the junior and senior years. This thorough preparation is given along certain specific lines in bacteriology, such as Soils, Dairying, Domestic Science, Pharmacy, Sanitation, etc. The advanced work undertakes from a bacteriological point of view the problems of the major work of the student, who is trained not only in technique, power of observation, and in the principles of bacteriology, but also in power of resourcefulness, initiative, and individual responsibility.

For the proper understanding of bacteriology, it is necessary to have had at least a course in general chemistry, which is a prerequisite for all students except those in the vocational courses.

Equipment. The department of bacteriology is located on the fourth floor of the Agricultural building. It occupies two large laboratories for general class work, one for special soil bacteriology and a laboratory for combined Experiment Station and Research Work. In addition there are the offices of the members of the department, a small but well-selected library including most of the authoritative works on bacteriology, besides a good list of the leading American and foreign periodicals. A dark-room, well-equipped for work in photomicrography, a store-room and large incubator room with automatically controlled temperature, is furnished for student use. The department is well supplied with the highest grade microscopes, ample glassware, both precision and common, and lead-topped desks.

Individual wall lockers, cylindrical and square copper sterilizers, supplied with steam from the main heating plant, small and large hot-air sterilizers, a large steam-pressure, horizontal sterilizer, the latter arranged for "dry-steam" sterilization, are conveniently arranged in the general laboratory for the larger sections. Small incubators are used by the advanced students. For special work demanding an extraordinary degree of exactness, there is a large electrically controlled and heated incubator. Lead-topped tables with convenient drawers furnish ample working space. Hot water, which is supplied to all laboratories, is fed by the main water system from a large hot-water tank. Sinks are uniformly lead. A high-power centrifuge is used. All the other necessary minor equipment for work in bacteriology is at the disposal of elementary and advanced students.

Major Courses. The purpose of these courses is to train students for Agricultural College and Experiment Station positions; for work in the Scientific Bureaus of the United States Department of Agriculture; for positions as Sanitary and Milk Inspectors with various State and City Boards of Health; as Laboratory Technicians for Health and Sanitary Boards and for Hospital Service; and likewise for testing laboratories for corporations, such as creameries, and producers of various food products.

COURSES IN BACTERIOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
Junior Year	1st	2nd
Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
*Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
*Electives	13	13
	—	—
	16	16

The following courses are offered:

A. Vocational Dairy Bacteriology. This course includes the bacteriological studies of milk, butter, and cheese; examination of starters, efficiency tests of pasteurization, cooling, straining, centrifuging, etc., and the general sanitation and cleanliness of the dairy.

Vocational Dairying; second semester; 2 credits; 1 lecture; 2 laboratory periods.

Fee: \$2.00.

B. Preventive Medicine. A consideration of certain common diseases of the human body, their cause, path of entrance, path of exit, method of transmission, and preventive methods to be taken

*Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

against them; domestic water supply, pure milk, the action of germicides and antiseptics.

Vocational Home Economics; first semester; 1 credit; 2 lectures or recitations.

101. Elementary Bacteriology. A series of lectures, recitations, and experiments to familiarize students with the underlying principles of bacteriology as applied to everyday life, especially to agricultural problems; and to serve as an introduction to the more advanced courses in the subject.

Prerequisite: one year's work in chemistry.

Agriculture: sophomore year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

Fee: \$3.00.

102. Elementary Laboratory Bacteriology. A course supplementing the lecture and laboratory work of Bacteriology 101.

Prerequisite: Bacteriology 101.

Agriculture; elective; sophomore, junior, and senior year; second semester; 2 credits; 2 laboratory periods.

Fee: \$2.00.

112. Advanced Bacteriology. Beginning with the first semester of the junior year, a student may elect bacteriology for the two semesters of that year, and continue advanced work through the two semesters of the senior year.

Prerequisite: Bacteriology 101.

Agriculture; elective; junior year; first semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods.

Fee: \$4.00.

113. Advanced Bacteriology. A continuation of course 112, the laboratory work familiarizing the student with special bacteriological apparatus and its use, and then proceeding with advanced work involving questions of pure science, as well as the application of bacteriology to professions and industries.

Prerequisite: Bacteriology 112.

Agriculture; junior year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods.

116. Research in Bacteriology. A thesis may be selected in this subject, beginning with the first semester, senior year, major bacteriology, and continuing through two semesters. The laboratory is thoroughly well equipped for research in agricultural, veterinary, domestic science, or pharmaceutical bacteriology. Work

for the master's degree, either as a major or minor in the department, may be selected. The investigations are all outlined and conducted by the student in cooperation with the instructional staff of the department.

Prerequisite: Bacteriology 112 and 113.

Agriculture; elective; junior year; credits and hours to be arranged.

Fee: \$4.00.

201. Pharmacy Bacteriology. A general course in bacteriology built up around the medical aspects of pharmacy. In general structure this course parallels Bacteriology 101.

Pharmacy; senior or junior year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

Fee: \$3.00.

202. Pharmacy Bacteriology. Continuation of Pharmacy Bacteriology 201, elementary clinical diagnosis, classification of bacteria, qualitative and quantitative determinations.

Prerequisite: Bacteriology 201.

Pharmacy; senior or junior year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

Fee: \$3.00

203. Clinical Bacteriology. This course, intended primarily for students in Pharmacy, deals with practice work in the ordinary methods of clinical diagnosis in use. Typhoid, Widal, diptheria, and tuberculosis routine tests, various pus formations, bacteriological examination of urine and feces, blood counting and its differentiation into its elements, dark-ground illumination.

Prerequisites: Bacteriology 201, 202, or equivalents.

Pharmacy or Agriculture; elective; senior year; first semester; 2 credits; 2 laboratory periods.

Fee: \$2.00.

204. Clinical Bacteriology. A continuation of Bacteriology 203.

Prerequisites: Bacteriology, 201, 202, 203.

Pharmacy or Agriculture; elective, senior year; second semester; 2 credits; 2 laboratory periods.

Fee: \$2.00.

205. Immunity and Vaccine Therapy. A study of the standard methods in vogue in the various immunity and therapeutic reactions, antitoxin formation, preparation and standardization of vaccines.

Prerequisites: Bacteriology 201, 202, or equivalents.

Agriculture or Pharmacy; elective, senior or graduate year; time and credits to be arranged.

Fee: \$3.00.

300. Domestic Science Bacteriology. Deals with bacteriology in relation to home life. An introduction to the subject, therefore, is made along theoretical lines, with application to sanitation and household practices. Water supply, action of septic tanks, house sanitation, control and prevention of specific diseases, fumigation, vinegar making, methods of contamination of milk, canning, treatment of wounds, etc.

Prerequisite: one year of chemistry. In its structure, this course parallels Bacteriology 101, with application to the problems of Home Economics.

Home Economics: sophomore year; second semester; 3 credits; 1 lecture, 1 recitation; 2 laboratory periods.

Fee: \$3.00.

301. Sanitary Bacteriology. Primarily for Home Economics students in continuation of Bacteriology 300. Standard sanitary bacterial examination of water, milk, butter, cheese, meat, air, etc., certain simple clinical methods. Use and action of anti-septics and germicides.

Prerequisite: Bacteriology 300 or equivalent. Home Economics or students from other departments with equivalent preparation; elective, junior or senior year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

Fee: \$3.00.

302. Zymology and Ferments. An elective for students in Home Economics who desire a specialized course dealing with technical fermentations and microscopic structure of the yeast plant and other fermentation organisms; the preparation and manipulation of special media designed for their growth; pure culture methods used in zymology, methods of laboratory testing of commercial yeasts, both for use in breadmaking and alcohol production, the bacteriology of salt-rising bread.

Prerequisite: Bacteriology 300 or equivalent.

Home Economics, or for students of other courses of equivalent preparation; elective, junior or senior year; either semester; 2 credits; 2 laboratory periods.

Fee: \$3.00.

401. Dairy Bacteriology. History of dairy bacteriology, physiology of bacteria, chemical reactions in dairy products due to bacteriological activities; standard methods of bacterial analysis of dairy products, methods of sanitation, disinfection, diagnosis of diseases and faults of milk, control of milk-borne epidemics, preparation of commercial health drinks such as Bulgarian milk, Yoghurt, etc., discussions of milk problems.

Prerequisite: Bacteriology 101.

Agriculture: senior year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

Fee: \$3.00.

501. Agricultural Bacteriology. The history and development of bacteriology as applied to scientific agriculture, micro-organisms in relationship to soil fertility, the destruction of organic matter and humus formation, plant food requirements and bio-chemicals, of the decomposition changes supplying such food, soil nitrogen requirements, the nitrogen cycle, nitrogen fixation by legume bacteria, media for the isolation and growth of soil organisms, soil types from the bacteriological point of view, ammonification, nitrification, denitrification, nonsymbiotic nitrogen fixation.

Prerequisite: Bacteriology 101.

Agriculture; senior year; first semester; 3 credits, 1 recitation, or lecture; 2 laboratory periods.

502. Agricultural Bacteriology. A continuation of bacteriology 501. A detailed study of soil changes due to micro-organisms. The effect of liming, manuring, and various methods of tillage, irrigation, and drainage, the activities of sulfur and iron bacteria, cellulose digestion, reference work to certain government and station bulletins, followed by abstract writing of the same for class use and discussion.

Prerequisites: Bacteriology 101, 501.

Agriculture; senior year; second semester; 3 credits; 1 recitation or lecture; 2 laboratory periods.

Fee: \$3.00.

701. Poultry Disease Bacteriology. The bacterial consideration of the most common diseases of poultry, chicken tuberculosis, chicken typhoid, white diarrhoea, roup, and avian diphtheria; soil contamination, and other methods of disease transportation.

Prerequisites: Bacteriology, 101, 102 or equivalent

Agriculture; junior or senior year; second semester; 2 credits; 2 laboratory periods.

Fee: \$2.00.

BOTANY AND PLANT PATHOLOGY

HOWARD PHILLIPS BARSS, Professor
WINFRED MCKENZIE ATWOOD, Associate Professor
WILLIAM EVANS LAWRENCE, Assistant Professor
MARION BERTICE MCKAY, Assistant Professor
CHARLES ELMER OWENS, Instructor
HOWARD SPURR HAMMOND, Instructor
GILBERT BRADLEY POSEY, Instructor
GORDON KELLER VAN GUNDIA, Instructor
HENRY CLARK GILBERT, Instructor
OTTO HERMAN ELMER, Instructor

The courses offered in this department aim not only to give the student a broad knowledge of plants, their structure both external and internal, their vital activities, their relationships to their environment and their natural classification, but also to impart such fundamental and practical information in regard to plants as shall form a strong foundation for the technical work in Agriculture, Forestry, Pharmacy, and Home Economics.

The general courses are so planned as to present the principles of botany from a genuinely scientific point of view, and then to show how the knowledge thus presented applies in a practical way to the problems which the students will meet in the life-work they have chosen. In order that the different needs of students pursuing different lines of work in the institution shall be met in the best possible way, separate sections are provided and the work in each section is planned with the particular interest and needs of that section in mind.

Technical and reference books are used mainly as an aid in correlating the facts brought out by the study of the actual plant specimens in the laboratory. Living plants are used wherever possible. Drawing is made an important feature of the laboratory work, because in order to draw accurately the students must observe closely.

Exceptional opportunities are afforded students who desire to specialize in botany or plant pathology. Well-equipped laboratories and the unusually favorable location for field study and collecting, offer an attractive inducement for those interested in advanced work. Special attention will be given to students wishing preparation for teaching economic biology or botany in the secondary schools, or the teaching of botany or plant pathology in Agricultural Colleges. Training is also provided for those who wish to enter the field of investigational work in Agricultural Experiment Stations, or in the United States Department of Agriculture under

the Civil Service. Agricultural extension workers, horticultural inspectors, district agriculturists, seed analysts, and pure food experts will find special training in Botany and Plant Pathology a most valuable asset.

Equipment. The Department of Botany and Plant Pathology occupies quarters on the second floor of the Agricultural Building at the south end. There is a lecture room provided with projection lantern. There are three general student laboratories well equipped for botanical work, compound and dissecting microscopes being provided for each student. The work in plant physiology is conducted in a laboratory provided with individual lockers and equipment for each student. The laboratory is well supplied with apparatus for general course work and for special investigation, including accurate analytical balances, coarse balances, muffle furnace, electrical ovens, apparatus for the study of the respiration of fruit, meteorological instruments, chemicals, laboratory glassware, reagents, etc. Greenhouse facilities and a dark room for experimentation are also provided. The library room contains a large number of volumes of American and foreign reference works relating to botany and plant pathology, complete sets of important scientific periodicals, increased yearly by the current numbers, and a rapidly growing collection of bulletins and papers of interest to workers and students in the department. A large room is set apart for an herbarium and here accommodation is provided for students in taxonomic botany for the rapid drying and mounting of pressed plants. A number of desks in this room are available for special and graduate students and the equipment for advanced work in plant histology and microscopic technique include a large electric paraffin bath, microtomes of different types, stains, chemicals, and glassware. For advanced students in plant pathology there is available an unusually well-equipped experimental laboratory, provided with thermostatic incubators, refrigerator, inclosed culture room, transfer case, electrical dry-air sterilizer, horizontal autoclave, and steam sterilizers connected with the central steam plant. There is also a photomicrographic apparatus and an excellent equipment for photographing ordinary specimens in the laboratory or in the field. A suitable photographic dark room is provided.

For demonstration and lecture purposes, the department possesses an excellent set of charts and models, a large collection of

lantern slides, photographs, and illustrative material. A museum exhibit of botanical and plant-disease specimens of great value and interest has been got together and is easily accessible to all students.

The surroundings of the Institution are particularly favorable for botanical study. On the campus are planted an interesting variety of trees, shrubs, and ornamental plants from various parts of the world, while a great diversity of economic plants are propagated on the College farm. The country about Corvallis furnishes an interesting variety of topographic features and places within easy distance the flora of the hill and valley, plain and mountain, meadow and forest. Of interest to students in plant pathology is a small corner of the College farm which has been set out with a great variety of fruits for the study of plant diseases.

The permanent equipment of the department includes an herbarium of flowering plants and gymnosperms of many thousand specimens which, in addition to Oregon forms, contains quite extensive collections from New Mexico, California, Washington, and Michigan. The herbarium is being rapidly enlarged, particular attention being paid to the accumulation of economic material, including the forage and shade trees of North America, agricultural plants, pharmaceutical plants, weeds and grasses. The cryptogamic herbarium includes several thousand specimens of fungi from North America and Europe, being particularly rich in parasitic forms.

COURSES IN BOTANY AND PLANT PATHOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Junior Year	Semester	
		1st	2nd
Agricultural Economics (Com. 219)		3	
Drill (Military 5, 6)		1	1
Military Science (Theo. Inst. 1, 2)		1	1
*Electives		12	15
		—	—
		17	17

*Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

	Senior Year	Semester	
		1st	2nd
National Government (Com. 320)		3	
State and Municipal Government (Com. 322)			3
*Electives		13	13
		<hr/> 16	<hr/> 16

The following courses are offered:

22. Botany for Home Economics Students. The fundamental principles of botany. Growth, reproduction, structure and physiological activities in higher plants. A concise survey of the entire plant kingdom. The relations of plants to their environment, their importance in nature and their usefulness to man. Plants and plant products used as foods and food materials or employed in the manufacture of home furnishings and textiles.

The course in Home Economics; freshman year; first semester; 2 credits; 2 lectures; 1 laboratory period of two hours.

Fee: \$1.00. Text: Curtis: Nature and Development of Plants.

23. Botany for Home Economics Students. Continuation and completion of work outlined under course 22.

Prerequisite: course 22.

The course in Home Economics; freshman year; second semester; 2 credits; 1 lecture; 1 laboratory period of three hours.

Fee: \$1.00. Text: Curtis: Nature and Development of Plants.

30. Forest Botany. Provides the basis for an adequate understanding of the forest and of the underlying principles of forestry. The structure, reproduction, and physiology of seed plants. The microscopic study of wood. The identification of trees and shrubs in their winter condition. The characteristics and relationships of the four great plant groups. An introduction to the identification of higher plants. Continued throughout the year.

The course in Forestry; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

Fee: \$1.00. Text: Curtis: Nature and Development of Plants.

31. Forest Botany. Continuation and completion of work described under course 30.

Prerequisite: Botany 30.

*Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

The course in Forestry; freshman year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

Fee: \$1.00. Text: Curtis: Nature and Development of Plants.

35. Forest Pathology and Taxonomy. The first part of the semester is devoted to the fungous diseases of forest trees and structural timber. The second part is devoted to the identification of forest trees, plants of the forest floor and native plants of importance on the forest ranges.

Prerequisites: Botany 30 and 31, or 41 and 42.

The course in Forestry; sophomore year; elective for others; second semester; 4 credits; 2 lectures; 3 laboratory periods.

Fee: \$2.00. Text: Piper & Beattie: Flora of the Northwest Coast.

41. Agricultural Botany. The fundamental principles of botany underlying agricultural practice. The structure, physiology, and development of higher plants from the seed to the flower. The structure and development of fruits, grains, fleshy roots, and tubers. A survey of the plant kingdom from its lowest to its highest forms with special emphasis on the groups of agricultural importance. Particular attention directed to food plants, stock-poisoning plants, and the organisms causing disease in plants. A brief systematic study of agricultural and other economic plants with practice in identification. Continued through the year.

The course in Agriculture; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

Fee: \$1.50. Text: Curtis: Nature and Development of Plants.

42. Agricultural Botany. Continuation and completion of work outlined under course 41.

Prerequisite: course 41.

The course in Agriculture; freshman year; second semester; 3 credits; 1 lecture; 3 laboratory periods.

Fee: \$1.50. Text: Curtis: Nature and Development of Plants.

47. Weeds, Poisonous Plants and Grasses. The structure and classification of farm weeds, grasses, poisonous plants, and other plants of economic importance. Well-selected types studied in detail. Each student collects and identifies as many specimens as time will permit.

Prerequisites: Botany 20, or 30 and 31, or 41 and 42, or 70.

Elective; second semester; 2 credits; 2 laboratory periods.

Fee: \$1.50. Text: Piper and Beattie: Flora of the Northwest Coast.

50. Plant Physiology. An introductory course in experimental Plant Physiology designed to impart a knowledge of the life-processes of the plant as a basis for intelligent agricultural and horticultural practice. Plant nutrition, growth, and response to environment. The functions of the living cell, the intake by the plant of water and raw materials from the soil. The transportation of materials through the plant. The loss of water. The manufacture, digestion, and assimilation of food, and the process of respiration.

Prerequisites: Botany 20, or 30 and 31, or 41 and 42, or 70, and in addition, Chemistry 500 and 501.

The course in Pomology; and the course in Botany or Plant Pathology; junior year; elective for others; second semester; 3 credits; 2 lectures; 2 laboratory periods.

Fee: \$2.50. Deposit: \$2.00. Duggar: Plant Physiology.

51. Advanced Plant Physiology. A more advanced course than the last. Further studies in the nutritional processes of plants and their relationship to environmental factors.

Prerequisite: Botany 50.

Elective; first semester; 2 or more credits (credits and hours for lecture and laboratory to be arranged with instructor).

66. Range Botany and Plant Ecology. The first part of the semester deals with the factors relating to depletion, renewal, and maintenance of pastures and ranges, with laboratory work in the identification of grasses and poisonous plants. The second part of the semester is devoted to the study of plants and plant societies in relation to the environment including field studies in physiographic ecology. Of special interest and value to students in Forestry.

Prerequisites: Botany 30 and 31, or 41 and 42, or the equivalent.

Elective; first semester; 2 credits; 1 lecture; 1 laboratory period.

Fee: \$1.50. Text: Piper and Beattie: Flora of the Northwest Coast, and Hitchcock: Grasses.

68. Classification of Flowering Plants. Native Oregon flowers and common cultivated ornamental plants. Collecting, identifying, pressing, and mounting of specimens by each student.

Prerequisites: Botany 20, or 30 and 31, or 41 and 42, or 70.

Elective; second semester; 2 credits; 2 laboratory periods. (Additional credits may be arranged for with the instructor.)

Fee: \$1.50. Texts: Piper and Beattie: The Flora of the Northwest Coast, and Gray: Field, Forest and Garden Botany.

70. Pharmaceutic Botany. A fundamental, preparatory course for Pharmacognosy and Materia Medica. A brief survey of the plant kingdom. A careful study of the structure of higher plants. The cell and cell contents. Various types of plant tissues. Work in elementary pharmacognosy with training in the microscopic identification of drugs and drug adulterants. In the spring practice is given in the identification of drug plants. Continued through the year.

The course in Pharmacy; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods.

Fee: \$1.50. Texts: Youngken: Pharmaceutical Botany, and Greenish: Food and Drugs.

71. Pharmaceutic Botany. Continuation and completion of work outlined under course 70.

Prerequisite: Botany 70.

The course in Pharmacy; freshman year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods.

Fee: \$1.50. Texts: Greenish: Foods and Drugs. Youngken: Pharmaceutical Botany.

73. Plant Evolution and Structure. The evolution of form, structure, and methods of reproduction for all groups of plants. Evolutionary tendencies and homologies of structure and function. An advanced course dealing with fundamental principles. The detailed examination in laboratory of selected types from the lowest to the highest groups of plants.

Prerequisites: Botany 20, 30, and 31, or 41 and 42, or 70.

The course in Botany; junior or senior year; elective for others; first semester; 3 credits; 2 lectures; 2 laboratory periods.

Fee: \$2.00. Texts: Coulter et al: A textbook of Botany, Vol. 1, part 1. Coulter: Evolution of Sex in Plants.

75. Plant Histology. An advanced course. The structure, inclusions, activities, and methods of division of the plant cell; the development, structure, and adaptation to function of various types of plant tissues. The preparation of temporary and permanent microscopic mounts, including fixation, dehydration, infiltration, sectioning and staining.

Prerequisites: Botany 20, or 30 and 31, or 41 and 42, or 70 and 71.

The course in Botany or Plant Pathology; junior or senior year; elective for others; first semester; 3 credits; 1 lecture; 3 laboratory periods.

Fee: \$2.00. Text: Stevens: Plant Anatomy.

80. Seminar. Required of all graduate students in Botany and Plant Pathology. Reports on advanced botanical studies. Abstracts of articles of botanical or phytopathological interest appearing in scientific journals, experiment station publications, or the agricultural press.

Elective; senior year; first semester; 1 credit will be given undergraduates regularly attending the meetings and making satisfactory reports; 1 hour session.

81. Seminar. The same as course 80 for second semester.

Elective; senior year; second semester; 1 credit as above; 1 hour.

82. Research and Thesis. For students specializing in Botany and Plant Pathology. Investigation of special problems or taking up of advanced studies not included in regular courses.

Elective; senior year; first semester; 1 or more credits (to be arranged for with instructor).

Fee: \$0.50 per credit.

83. Research and Thesis. Work as outlined in course 82; second semester.

Elective; senior year; second semester; 1 or more credits.

Fee: \$0.50 per credit.

101. Principles of Plant Pathology. Disease in plants: the causes, symptoms, effects, methods of distribution, etc. The principles of plant disease control. Disease resistance in plants. Quarantine and inspection. Detailed examination in the laboratory of representative examples from the different groups of plant parasites. A study of various types of plant diseases, their life-histories and their microscopic appearance.

Prerequisites: Botany 20, or 30 and 31, or 41 and 42, or 70.

The courses in Pomology, Olericulture, and Farm Crops; junior or senior year; elective for others; first semester; 2 credits; 1 lecture; 2 laboratory periods.

Fee: \$1.50. Text: Duggar: Fungous Diseases of Plants.

102. Diseases of Orchard and Small Fruits. The causes, symptoms, progress, and control of the important fungous, bacterial, and physiological diseases of orchard trees, and small fruits, with particular emphasis on those of importance in the Pacific Northwest. Laboratory study of specimens showing the effects of the parasite on the tissues of the host, and the microscopic appearance of the causal organism. Frequent field excursions to demonstrate the characteristic results of different diseases under natural conditions.

Prerequisite: Botany 101.

The course in Pomology; senior year; elective for others; second semester; 2 credits; 2 lectures; 1 laboratory period.

Fee: \$1.50.

104. Diseases of Vegetable Crops. The causes, symptoms, progress, and methods of control of the important fungous, bacterial, and other diseases of truck and garden vegetables and fruits with particular attention to those which are serious in the Northwest. Careful laboratory study of typically diseased specimens with microscopic examination of the affected tissues and of the parasitic organisms. Field excursions.

Prerequisite: Botany 101.

The course in Olericulture; senior year; elective for others; second semester; 2 credits; 2 lectures; 1 laboratory period.

Fee: \$1.50.

105 Diseases of Field Crops. The causes, symptoms, progress and methods of control of the important fungous and bacterial diseases of cereals and other field and forage crops, with particular attention to those of importance in the Northwest. Typical examples of the diseases are studied in the laboratory. Microscopic examination of the affected tissues and of the causal parasites.

Prerequisite or Parallel: Botany 101.

The course in Field Crops, junior year, and Farm Management, senior year; elective for others; first semester; 1 credit; 1 laboratory period.

111. Laboratory Methods in Plant Pathology. A training course in methods of investigation in plant pathology. Record keeping; care of collections; culture work; inoculation methods; photographic work, etc.

Prerequisite: Botany 101.

The course in Plant Pathology; junior or senior year; elective for others; second semester; 2 credits; 1 lecture; 2 laboratory periods.

Fee: \$2.00.

113. Methods of Control of Plant Diseases. A lecture course on the special methods employed in the practical control of plant diseases, including the use of various fungicides for different types of diseases; the time and methods of application; surgery; sanitation; crop rotation; the development of resistant varieties; soil disinfection; seed treatment, etc.

Prerequisite: Botany 101.

The course in Plant Pathology; junior or senior year; elective for others; second semester; 1 credit; 1 lecture.

116. Advanced Plant Pathology. Special studies in the field and in the laboratory of selected plant diseases, or of plant disease problems; designed to provide training and experience in phytopathological investigations, or to extend the student's knowledge of plant diseases beyond the limits attained by the introductory courses.

Prerequisite: Botany 101.

The course in Plant Pathology; senior year; elective for others; second semester; 2 or more credits; 1 lecture; laboratory periods to be arranged with instructor.

Fee: \$2.00.

118. Mycology. The different groups of fungi; their structure; modes of reproduction; nuclear phenomena; phylogeny and classification, with particular attention to parasite forms. Practice in the identification of fungi. Each student will collect, identify, and properly prepare specimens for an herbarium.

Prerequisite: Botany 101.

The course in Plant Pathology; senior year; elective for others; first semester; 3 or more credits; two lectures; 2 or more laboratory periods.

Fee: \$2.00. Text: Stevens: Fungi that Cause Plant Disease.

Graduate Courses. Botany 51, 80, 81, 111, 113, 115, and 116 may be taken by graduate students as major or minor electives with full credit.

Opportunity will be given students to elect work in Economic Botany or Plant Pathology not offered in the above mentioned courses by registering in Botany 82 or 83, either as a major or minor subject. Students who elect Botany as a major must have

completed the work, or equivalent, required in the freshman year of the Agricultural course.

Note.—Any of the courses in Botany except 20, 30, 31, 35, 41, 42, 70, and 71, may be taken as minor electives by junior, senior, or graduate students in any course, upon consultation with the head of the department, provided the course to be elected is not regularly required in the course of study in which the student is registered.

DAIRY HUSBANDRY

ROY RALPH GRAVES, Professor
OTTO GERALD SIMPSON, Assistant Professor
EDWARD BLODGETT FITTS, Assistant Professor (Ext.)
PAUL STANLEY LUCAS, Instructor
D. C. HOWARD, Instructor

Dairy Production and Dairy Manufacturing are the courses which the Dairy department will offer.

Dairying is rapidly becoming the leading animal industry of the United States. The last census report shows that there are more than twenty million dairy cows in the United States and the annual value of their products is approximately six hundred million dollars.

Since the population of the country is rapidly increasing, as is also the per capita consumption of dairy products, it seems likely that the importance of the Dairy Industry will continue to advance.

The Pacific Northwest, on account of its even temperature and abundant growth of forage crops, is peculiarly adapted to dairying; and the rapid growth of this industry is creating splendid opportunities for young men in the various fields of dairying, such as the breeding of pure-bred dairy cattle, the management of dairy farms, and the management of creameries, cheese factories, and city milk plants. There are many other openings in government work, college work, and county advisory positions for those who do not care to enter the field of practical dairying.

The production and manufacturing courses are so arranged that the student may major in one course, and yet elect enough of the other course to enable him to have a working knowledge of that phase of the industry.

In the production work, it is the intention to give the student a thorough course in the breeding, feeding, judging, care, management, and diseases of dairy cattle.

In order to meet the needs of the industry and the demand for information, the department offers the following courses: A one-year course, designed to fit students for positions as operators of creameries and cheese factories or as managers of dairy farms. A winter short course in both Dairy Manufacturing and Dairy Production. The four-years course, designed to qualify students for agricultural college and experiment station work; for inspectors of dairy products and dairy establishments in city, state, or government service; or as managers of creameries or large dairy farms.

Equipment. The Dairy building, with its three floors and its newly remodeled manufacturing facilities, affords convenient and modern resources for the work of this department. In the manufacturing work, it is the intention to give the student theory and practice in the manufacture of dairy products. Commodious quarters are provided for this department in the Dairy building. The equipment is such as to permit handling milk and cream on a commercial scale, thus giving the student practice under actual factory conditions. On the first floor, are the offices and manufacturing rooms, the latter including a boiler room equipped with a 15 H. P. internal furnace boiler and a 10 H. P. Jewel automatic steam engine; a farm butter-making room, in which are found hand churns, butter workers, and the various types of separators found on the market; a churn room, which is equipped with modern ripeners, combined churns, various forms of butter-molding appliances, refrigerating machine, cooling room, and ice-cream freezer; a cheese room, which is equipped with cheese vats, automatic pressure cheese press, and other equipment used in the cheese factory; a cheese curing room; and a reading room.

On the second floor, are located recitation rooms, and advanced and general laboratories. The latter will accommodate two hundred students in sections of forty each, and are equipped with a full line of appliances for testing milk and milk products. In the advanced laboratory, will be found moisture tests, salt tests, curd tests, and various other forms of apparatus suited to the needs of the advanced student. A circulating hot water system connects the wash sinks in all of the laboratories. Both steam and electricity are used for power purposes.

The College dairy herd consists of sixty-one head of choice dairy cattle of the Guernsey, Jersey, Holstein-Friesian, and Ayrshire breeds. These cattle are housed in a modern dairy barn.

COURSES IN DAIRY HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

One-Year Course in Dairying.

	Semester	
	1st	2nd
Elementary Vocational English (Eng. G)	3	
Advanced Vocational English (Eng. H)		3
Dairy Accounting (Com. D)		3
Dairy Mechanics (Ind. Arts 228)	1	or 1
Dairy Mechanics (F. M. 7)	1	or 1
Testing Dairy Products (D. H. A.)	2	
Dairy Bacteriology (Bact. 406)		2
Drill (Military A. B.)	1	1
Gymnasium (Phys. Ed. 11, 12)	1½	1½
Dairy Manufacturing (Optional)—		
Butter Making and Factory Management (D. H. B.)	4	
Cheese Making (D. H. C.)		4
Ice Cream (D. H. D.)	2	
Judging Butter and Cheese (D. H. H. I.)	1	1
Cremeary Practice (D. H. E. F.)	2	2
Special Creamery Tests (D. H. P.)		2
Breeding, Feeding and Management Dairy Cattle		
(D. H. J. K.*)	2	2*
Judging Dairy Cattle (D. H. L. M.*)	1	1*
Dairy Production (Optional)—		
Diseases of Dairy Cattle (Vet. Med. 17, 18)	2	2
Farm Crops (Farm Crops A)		3
Judging Dairy Cattle (D. H. L. M.)	1	1
Breeding, Feeding and Management Dairy Cattle		
(D. H. J. K.)	2	2
Dairy Practice (D. H. N. O.)	1	1
Farm Soils (Soils A)	3	
Blacksmithing (Ind. Arts L), and Wood work (Ind.		
Arts G), and Live Stock Management (A. H. 2)		
Elective.		

*Second semester of Breeding, Feeding, and Management of Dairy Cattle and Judging Dairy Cattle are optional.

Degree Courses in Dairy Husbandry**(a) Dairy Production****Junior Year**

	1st	2nd
Agricultural Economics (Com. 219)	3	
Forage Crops (Farm Crops 9)	2	
Animal Nutrition (A. H. 7)	2	
Genetics (Zool. 120)	3	
Comparative Anatomy (Vet. Med. 1)	3	
Animal Chemistry (Chem. 509)	2	
Comparative Physiology (Vet. Med. 2)		3
Herd Management and Milk Production (D. H. 2)		5
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Electives	1	6
Junior Seminar (D. H. 21)		1
	18	17

Senior Year

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Dairy Bacteriology (Bact. 401)	3	
Breeds and Breeding of Dairy Cattle (D. H. 5)	3	
Diseases of Live Stock (Vet. Med. 3, 4)	3	3
Dairy Inspection and Dairy Farm Equipment (D. H. 6) ..	3	
Dairy Mechanics (Ind. Arts 228)	1	or 1
Dairy Mechanics (F. M. 7)	1	or 1
Buttermaking and Factory Management (D. H. 3)		5
Senior Seminar (D. H. 8)		1
Advanced Judging (D. H. 10) (Elective)	1	
Approved Electives		1
Dairy Research (D. H. 12) (Elective)		
	16	16

(b) Dairy Manufacturing

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Forage Crops (Farm Crops 9)	2	
Animal Nutrition (A. H. 7)	2	
Business Organization and Management (Com. 110).....	3	
Genetics (Zool. 120)	3	
Dairy Chemistry (Chem. 502)		3
Buttermaking and Factory Management (D. H. 3)		5
Milk Production and Herd Management (D. H. 2)		5
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	2	1
Junior Seminar (D. H. 21)		1
	—	—
	17	17
Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Cheesemaking (D. H. 4)	4	
Dairy Bacteriology (Bact. 401)	3	
Breeds and Breeding of Dairy Cattle (D. H. 5)	3	
Dairy Inspection and Dairy Farm Equipment (D. H. 6)..	3	
Ice Cream and Ices (D. H. 7)		2
Dairy Mechanics (Ind. Arts 28)	1	or 1
Dairy Mechanics (F. M. 7)	1	or 1
Seminar (D. H. 8)		1
Butter and Cheese Judging (D. H. 9)		1
Electives		7
	—	—
	16	16

The following courses are offered:

A. **Testing Dairy Products.** The testing of dairy products by the Babcock test, with special emphasis on conditions affecting the results of the test under practical conditions.

Required in one-year dairy course in Dairy Production, and in Dairy Manufacturing; first semester; 2 credits; 2 laboratory periods.

Fee: \$1.00. Deposit: \$2.00

B. Buttermaking and Factory Management. The principles of creamery buttermaking; construction, management, and care of the creamery; a comparison of the various methods commonly used in the manufacture of butter in creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; churning and packing butter.

Required in one-year course in Dairy Manufacturing; first semester; 4 credits; 2 lectures; 2 laboratory periods.

Fee: \$1.00. Deposit: \$2.00

C. Cheesemaking. The commercial manufacture of cheddar cheese, covering the process in detail; a comparison of the different methods commonly employed; a study of other varieties of cheese; factory management and construction.

Laboratory. Practice in making cheddar and other varieties of cheeses. Records are kept of the different operations to note their effect on the finished product.

Required in one-year course in Dairy Manufacturing; second semester; 4 credits; 2 lectures; 2 laboratory periods.

Fee: \$1.00. Deposit: \$2.00

D. Ice Cream. The preparation of mixes for various frozen products by different formulas; the freezing, packing, and sale of frozen products.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 1 three-hour laboratory period; 1 lecture.

Fee: \$1.00. Deposit: \$2.00

E. Creamery Practice. Work in the creamery, care of creamery machinery, repairing and cleaning apparatus, to familiarize the student with practical creamery work.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 2 three-hour laboratory periods.

F. Creamery Practice. Continuation of E; second semester; 2 credits; 2 three-hour laboratory periods.

H. Butter and Cheese Judging. Judging butter and cheese with score card; discussion of the defects of body and flavor.

Required in one-year course in Dairy Manufacturing; first semester; 1 credit; 1 three-hour laboratory period.

I. Butter and Cheese Judging. Continuation of H; second semester; 1 credit; 1 three-hour laboratory period.

Fee: \$0.50.

J. Breeding, Feeding, and Management of Dairy Cattle. The history and development of the dairy breeds; a study of the breeding of the principal families of the various breeds; the selection and use of the pure-bred dairy sire in grading up the herd; the practice of inbreeding, linebreeding, and crossbreeding in improving dairy cattle. Feeding dairy cattle for economical milk production; feeding for records; developing the dairy calf; developing the dairy heifer; care of the dairy herd; care of the cow at time of parturition; methods of testing and record keeping; care and handling of the bull; the organization and purpose of cow testing, bull and community breeders' associations; the construction of dairy barns, milk houses, manure sheds, and silos; practical problems.

Required in one-year courses in Dairy Production; first semester; 2 credits; 2 lectures.

K. Breeding, Feeding, and Management of Dairy Cattle. Continuation of J; second semester; 2 credits; 2 lectures.

L. Judging Dairy Cattle. Scoring animals by breeds and general score cards and placing classes of animals.

Required in one-year course in Dairy Production; first semester; 1 credit; 1 laboratory period.

Fee: \$0.25.

M. Judging Dairy Cattle. Continuation of L; second semester; 1 credit; 1 laboratory period.

Fee: \$0.25.

N. Dairy Practice. Practice in computing and mixing rations; tracing and compiling extended pedigrees; fitting animals for the show ring.

Required in one-year course in Dairy Production; first semester; 1 credit; 1 three-hour laboratory period.

O. Dairy Practice. Continuation of N; second semester; 1 credit; 1 three-hour laboratory period.

P. Special Creamery Tests. Advanced work in the use of the Babcock test. Short cuts and conveniences for rapid and efficient testing; rapid tests for adulterants and preservatives; curd, acidity, and sediment tests.

Required in one-year course in Dairy Manufacturing; second semester; 2 credits; 2 three-hour laboratory periods.

Fee: \$1.00. Deposit: \$2.00

1. Elements of Dairying. The secretion and composition of milk, and the causes of variation in composition; brief discussion

of dairy cattle, and the factors in milk production; the Babcock test applied to milk and other products; use of the lactometer; the various methods of creaming; the operation of cream separators; the care of milk and cream; making butter under farm conditions. The general principles of cheesemaking; marketing of milk; dairy by-products; statistics and economics of the dairy industry.

Fee: \$1.00. Deposit: \$2.00

Laboratory. The use of the Babcock test applied to milk and dairy products, with special attention to conditions that may affect the accuracy of tests; use of the lactometer; churning and working butter; a study of the construction, operation, and efficiency of various makes of cream separators; practice in ascertaining the yield of milk and fat, and the cost of production of cows in the College herd.

Required in all courses in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period.

2. Dairy Herd Management and Milk Production. Form and its relation to production; difference in the efficiency of dairy cows; improvement of dairy herds; methods of testing and record keeping; the use and importance of the pure bred dairy sire in grading up the herd. **Care of the Dairy Herd:** care of the cow at time of parturition; the dairy calf and its successful development; developing the dairy heifer; care of the bull; feeding for economical milk production and for records. **Registered dairy cattle and their management,** fitting for the show ring, advertising cattle, and sales. **Dairy Farm Economics:** the preservation and saving of manure; labor; crop systems for the dairy farm, soiling, pasturing, feeds; silage crops and the making of silage; the organization and purpose of cow-testing, bull, and community breeders' association. **Milk Production:** the production of market and certified milk; sources of infection and contamination of milk; the effect of different kinds of feed on flavor and healthfulness of milk; pasteurization of milk; contracts between milk companies and drivers.

Laboratory. Judging dairy cattle; scoring animals by breed and general score cards and judging classes of animals. Animals of the College herd will be used; and trips to local dairies, and an annual trip to prominent dairy farms in the Willamette Valley will be taken by College classes.

Prerequisite: Animal Husbandry 7.

Required in courses in Dairy Production and Dairy Manufac-

turing; junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods.

Fee: \$0.25. Text: Eckles: Dairy Cattle and Milk Production.

3. Buttermaking and Factory Management. The composition of milk and cream; the effects of condition of milk and cream on the quality and yield of butter; pasteurization; starters; ripening and churning cream; packing and marketing butter. The location, organization, and construction of creameries; creamery refrigeration and management; creamery accounting; and other studies designed to fit the student to manage and operate creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; the use of starters; churning, with special attention to factors that control the composition of butter; packing and wrapping butter; the use of the acidity, moisture, and salt tests.

Prerequisites: Dairy Husbandry 1, Bacteriology 101.

Required in courses in Dairy Production; senior year; second semester; in course in Dairy Manufacturing; junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods.

Fee: \$1.00. Deposit: \$2.00.

4. Cheesemaking. The importance of quality and composition of milk in the manufacture of cheddar cheese; composition and characteristics of common American and European cheeses; ferments and fermentations and their control; factory management and construction; the making of cheddar cheese and some forms of soft cheeses.

Laboratory. Practice work in receiving and sampling milk; the use of the various tests for acidity, ferments, fats, solids, and casein; the making and curing of cheddar and other varieties of cheeses; the computation of yields, cost of manufacture, and profit; the effect of different methods of manufacture on yield and quality.

Prerequisites: Dairy Husbandry 1, Chemistry 502.

Required in course in Dairy Manufacturing; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Deposit: \$2.00. Text: Van Slyke and Publow: Principles and Practice of Cheesemaking.

5. Breeds and Breeding of Dairy Cattle. The origin, history, and development of breeds of dairy cattle, their distribution and their characteristics. A study of the breeding of the principal

families of the various breeds. Application of the principles of Genetics to the breeding of dairy cattle.

Laboratory. Practice in the use of the breed herd books in tracing and making pedigrees. A study of methods of registering animals and advanced registry systems.

Required in courses in Dairy Production and in Dairy Manufacturing; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$2.50.

6. Dairy Inspection and Dairy Farm Equipment. A. Application of Babcock test; use of the lactometer in detecting adulterations; rapid tests for various preservatives and methods of detecting adulterations; moisture, acidity, salt, curd, casein, and sediment tests; the score-card system of dairy inspection; study of federal, state, and city laws governing the production and sale of dairy products; city milk inspection. B. Arrangement, construction, and equipment of dairy barns, milk houses, milk bottling plants, silos, manure sheds, covered exercise sheds, ice houses, and in planning and laying out dairy plants for special purposes.

Prerequisite: Elementary Bacteriology, (Bact. 101).

Required in courses in Dairy Production and Dairy Manufacturing; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.00. Deposit: \$2.50. Text: Farrington and Woll: Testing Milk and Its Products.

7. Ice Cream and Ices. A study of the preparation, packing, and marketing of ice creams, sherbets, and related frozen products.

Laboratory. Practice in selecting and aging of cream for ice cream; standardizing and preparing the mix for the various frozen products; the freezing, packing, bricking, molding, coloring, and sale of the various frozen products; judging ice cream and related frozen products by the score card.

Required in course in Dairy Manufacturing; senior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period.

Fee: \$1.00. Deposit: \$2.00.

8. Seminar. The study and review of new experiment station bulletins, and general dairy periodicals and literature. Papers are presented by the student on dairy subjects. Practice is given in outlining investigational work.

Required of all seniors and advanced students majoring in Dairy Production and Dairy Manufacturing; senior year; second semester; 1 credit.

9. Butter and Cheese Judging. Judging of butter and cheese with score cards; discussion of defects of body and flavor.

Required in course in Dairy Manufacturing; senior year; second semester; 1 credit; 1 three-hour laboratory period.

Fee: \$0.50.

10. Advanced Judging. Practice in judging dairy animals. This work, which includes trips to fairs and breeders' farms, is especially for those who desire to try for the Dairy Judging Team.

Elective; senior year; first semester; 1 credit; 2 two-hour laboratory periods.

Fee: \$0.25.

21. Seminar. Required of all juniors majoring in Dairy Production or Dairy Manufacturing. Second semester; one credit.

30. Research and Thesis Work. This work is offered for senior and graduate students majoring in Dairy Husbandry. Investigational problems are assigned that will give the student training and experience in experimental work.

Elective for seniors and graduate students; first semester; credits to be arranged.

Fee: \$2.00.

Research and Thesis Work. Effective for seniors and graduate students; second semester; credits to be arranged.

40. Dairy Herd Management. A course similar to D. H. 2, except that all laboratory work is eliminated.

Junior or senior year; second semester; 3 credits; 3 lectures.

DRAINAGE AND IRRIGATION

WILBUR LOUIS POWERS, Associate Professor
Instructor

Courses in Irrigation and Drainage hitherto have dealt with these subjects largely from the engineer's standpoint; and the disposal of water from soil or distribution of water within the farm unit has been considered of such small concern as to require nothing but a brief and more or less superficial treatment. Reclamation development has progressed so far, however, that haphazard and loose practices are no longer considered profitable. If the reclamation projects are to pay for costly development, great

care must be given to the location of tile or the distribution of water on the farm. The adoption of scientific methods of handling soils and crops under irrigation and drainage projects, is coming to be regarded as of paramount importance. With the further extension of state and federal aid to reclamation, there will be a greater demand for men who have a knowledge of how most successfully and economically to use water which the engineer's canals and reservoirs provide. These men must know the best time, amount, and method of irrigation, and the effects of irrigation upon soils and crops. They should also know the relations between soils, soil waters, and drainage, and understand how to locate and construct drains and treat the soil so as to secure the highest possible efficiency for each unit of tile employed.

In this course students combine practical and theoretical training received through lectures, laboratory exercises, and field experiments. The course offers opportunity for electing courses in general agriculture, economics, and other electives to give the student a broad training for modern irrigation farming, irrigation investigations, or the work of a drainage specialist.

Equipment. For the class and field work in Irrigation and Drainage, surveying instruments, tile, and ditching tools, weirs, flumes, hook gauges, water-stage register, electric pumping plant, etc., are available. Weather-recording instruments of different kinds supply equipment for the course in Climatology. A new laboratory fitted with desks, ovens, etc., will afford opportunity for studies of the movement and retention of irrigation water in soil, the effects of irrigation upon soils and crops, the effect of tile drainage upon soils of different types, their rate of drainage, etc. The experimental plots and field work in this course offer exceptional opportunity to study drainage and irrigation under practical field conditions. On the College farm the students build weirs, measure water, lay out distribution systems, make cement pipe for laterals, and test pumping machinery. On the drainage plots, the rate of discharge is measured and the effect of drains and soil conditions on water table is studied. Students are required to lay out, level, set grade stakes, and actually lay the tile in some part of a drainage system on the College land.

COURSE IN DRAINAGE AND IRRIGATION*

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Irrigation Farming (Drain. & Irr. 3)	3	
Climatology (Drain. & Irr. 5)		1
Topographic Surveying (C. E. 243)	2	
Elementary Bacteriology (Bact. 101)	3	
Introduc. Entomology (Ento. 301)	2	
Land Drainage (Drain. & Irr. 1)		3
Elements of Dairying (D. H. 1)		3
Crop Improvement (Field Crops 15)		3
Farm Power Machinery (F. Mech. 3)		3
Military Science (Theo. Inst. 1, 2)	1	1
Drill (Military 5, 6)	1	1
Approved Electives	2	2
	—	—
	17	17

Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Hydraulics (I. E. 101)	2	
Hydraulic Lab. (Exp. E. 265)	1	
Irrigation Institutions (Drain. & Irr. 9)	2	
Soil Fertility (Soils 7)	4	
Advanced Irrigation (Drain. & Irr. 15)	2	
Advanced Land Drainage (Drain. & Irr. 7)		3
Seminar (Drain. & Irr. 17)		1
Feeds and Feeding (A. H. 23)		3
Dairy Herd Management (D. H. 40)		3
Approved Electives	2	3
	—	—
	16	16

*In the sophomore year students specializing in Irrigation Farming are required to take Trigonometry (Math. 11, 3 credits, 1st semester), and Soil Physics (Soils 3, 4 credits, 2d semester), instead of Elementary Bacteriology (3 credits, 1st semester), and Elements of Dairying (3 credits, 2d semester).

The following courses are offered:

A. Practical Farm Drainage. The value of drainage, and the methods and cost of installing drainage systems under different soil and land conditions, district drainage, etc.

Elective in vocational course; second semester; 2 credits; 1 recitation; 1 laboratory period.

Fee: \$1.00.

C. Irrigation Farming Practices. The most effective methods of handling irrigation waters, the different crops under irrigation, and the cost and profits thereof. Organization as affecting water use and control in irrigated districts.

Vocational course; 1st semester; 2 credits; 2 recitations.

Fee: \$1.00. Text: Fortier: Use of Water in Irrigation.

1. Land Drainage. The history of drainage; road, field, and sanitary drainage on the farm; the different systems of drainage; methods of locating, installing, operating, and maintaining drainage conduits, cost, efficiency, and profits; the effect on crops and soil; laws governing. Lectures, notes, readings, and field work.

Elective; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.00. Deposit: \$1.00. Text: Elliott: Practical Farm Drainage.

3. Irrigation Farming. Methods of obtaining, distributing, and conserving irrigation waters. Handling of different crops under irrigation. Cost and profits thereof, and duty of water in various districts of Oregon. Water rights and irrigation codes. Field and laboratory studies of irrigable qualities of different soils, laying out of irrigation systems.

Elective; junior year, first semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.00. Deposit: \$1.00.

5. Climatology. Practical meteorology; observing and recording local weather and forecasting; a study of the climate of Oregon and the effect of climate upon agriculture. Class room and laboratory work.

Elective; junior or senior year; second semester; 2 credits: 1 recitation; 1 laboratory period.

Fee: \$0.50. Deposit: \$1.00. Text: Chandler: Elements of Western Water Law.

7. Advanced Land Drainage. A study of drainage problems and conditions in the field. The actual surveying, laying out, draughting of plans, estimation of cost, and installation of drainage systems at different points in the State, is required of students taking this course. A complete report of the organization of a drainage district is prepared by each class.

Prerequisite: Drainage and Irrigation 1.

Elective; senior year, second semester; 3 credits; 1 recitation: 2 laboratory periods (week end).

Fee: \$0.50. Deposit: \$1.00.

9. Irrigation Institutions. A brief history of the development of water laws. Water rights and irrigation codes in the different states, particularly in the Northwest and Oregon. Appropriation, adjudication, and administration of water. Reclamation and other government and state land acts affecting irrigation development. Organization and administration of irrigation districts and projects, water users' associations, etc. Discussion of public questions relating to irrigation.

Elective; senior year; 1st semester; 2 credits; 2 recitations.

11. Irrigation Farming Elective. Special course for Irrigation Engineering students or other students who cannot take the regular course in Irrigation Farming the first semester. This course deals with the handling of irrigation water after it reaches the farm, and of the different crops under irrigation. The irrigable quality of different soils, the duty of water in various districts of Oregon, and water rights and irrigation codes from the standpoint of the farmer, are important features of the course.

Elective; junior or senior year; second semester; 2 credits; 2 recitations.

13. Irrigation Field Practice. This course is planned to add interest to irrigation farming and develop a practical knowledge of irrigation farming conditions. Careful records are to be kept of water used on different soils and crops and of the yield obtained from definite areas. The work may be done during the summer months in connection with duties as ditch rider or other field agent. A report is required.

Prerequisite: Drainage and Irrigation 3.

Following 2nd or 3rd college year's work; 1 to 3 credits.

15. Advanced Irrigation. Irrigation literature and methods of irrigation investigation. Field and laboratory studies of irriga-

tion experiments and calculation of depth of water applied and of the most economical production thereby secured. Costs and profits connected with irrigation are determined. Analysis of data and preparation of a report is required in this course. Field examinations, where possible, will be made of some of the largest projects in the State.

Senior year; first semester; 3 credits.

Fee: \$0.50. Deposit: \$1.00.

17. Seminar. Weekly meetings are held in which papers on Drainage and Irrigation subjects are read and discussed. These papers will be prepared under supervision and will deal with special subjects of interest to students specializing in the course but which are not covered in the other work.

Required of seniors and advanced students specializing in Drainage or Irrigation.

Senior or graduate year; second semester; 1 credit.

19. Advanced Drainage or Irrigation Work. Under this head the student who has completed the courses offered may take up further study of special problems in either subject, such as the drainage of alkali lands, drainage against seepage, study of water-table fluctuations, runoff, etc.; or field studies of the duty of water for a certain district, conservation of irrigation waters, effect of irrigation on soil moisture conditions, etc.

Elective; senior or graduate year; either semester; 2 to 5 credits.

Fee: \$0.50. Deposit: \$1.00.

20. Advanced Drainage or Irrigation Work. Continuation of course 19 for students who wish to elect two semesters of the advanced work.

Elective; senior or graduate year; either semester; 2 to 5 credits.

Fee: \$0.50. Deposit: \$1.00.

ENTOMOLOGY

LESTER LOVETT, Associate Professor
GEORGE FRANKLIN MOZNETTE, Assistant Professor
WILLARD JOSEPH CHAMBERLIN, Instructor

The courses in Entomology are planned to give the student sufficient knowledge of the subject to understand the proper relation of Entomology to the different phases of Agriculture; to meet the needs of the student specializing in Entomology; and to serve

the needs of students from other departments in which certain special courses are required. Students who wish to elect Entomology as a major may, if they desire, specialize in one or more branches by choosing their research problems in definitely grouped subjects. These groups include General Entomology, Agricultural Entomology, Civic Entomology, Entomology for Horticultural Inspectors, and Forest Entomology.

The courses in General and Economic Entomology are intended to provide the student with sufficient training to enable him to identify the common insect pests, understand their habits and life-history, and to apply the most approved methods for their control.

Forest Entomology includes the practical investigation of certain areas of timber to determine the kind and extent of insect infestation, methods of making out correct reports on forest insect infestation, and an investigation of the principles underlying control methods.

Advanced students in Entomology are provided with excellent opportunities for special instruction and research work. The library facilities are unusually good; the insect fauna of the western part of the State is distinctive, offering many new and interesting features for investigation.

Scheduled courses in this department will not be given to a class of less than five students.

Equipment. This department now occupies three rooms on the third floor of Agricultural Hall—one office, one laboratory, and one class room. The entomological class room is equipped for twenty-four advanced students. It also contains the entomological collections and extension materials. The research laboratory is fully equipped with up-to-date apparatus for carrying on research problems. The entomological library is exceedingly rich in old volumes and complete sets of entomological periodicals. Through the kindness of the librarian of the U. S. Department of Agriculture, students in this department have access to entomological publications contained in the library of the Department of Agriculture and the library of Congress.

COURSES IN ENTOMOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
*Electives	12	15
	17	17
Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
*Electives	13	13
	16	16

The following courses are offered:

301. Introductory Entomology. An introduction to the study of insects by lectures, laboratory, and field exercises. Sufficient field work in collecting, and laboratory work in properly mounting and classifying insects, is provided to make the student familiar with the principal orders of insects.

Prerequisites: Zoology 101, 102, and a collection of insects consisting of at least 250 specimens.

Required in the courses in Horticulture, Plant Pathology, and Entomology; elective in other courses; junior year; first semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period.

Fee: \$1.00. Text: Sanderson & Jackson: Elementary Entomology.

302. Entomology of Orchard and Small Fruits. An intensive study of the more important insect enemies of the apple, pear, prune, cherry, plum, currant, gooseberry, bramble fruits, and strawberry, and the critical examination of the methods to be employed in combating them. Each important pest will be studied in the field and laboratory, with a view to becoming thoroughly familiar with the appearance of the insect and its work in all its stages of development. In this and succeeding courses in Entomology the rearing of economic and other forms of insects, is carried on parallel with other work, to gain familiarity with the development

*Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

and habits of insects. Each student is required to familiarize himself with the life-history, habits, and methods of controlling some insect of economic importance.

Prerequisite: Entomology 301.

Required in the courses in Pomology, Plant Pathology, and Entomology; elective in other courses; junior year; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period.

Fee: \$1.00. Text: Sanderson: Insect Pests of Farm, Garden, and Orchard.

303. Entomology of Truck and Field Crops. A course similar to 302, with special emphasis put on the intensive study of the insect enemies of celery, onion, beet, cabbage, kale, clover, vetch, potato, hop, corn, wheat, and oats.

Prerequisite: Entomology 301.

Required in the course in Vegetable Gardening; junior or senior year; elective for students in other courses; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period.

Fee: \$1.00. Text: Sanderson: Insect Pests of Farm, Garden, and Orchard.

304. Forest Entomology. A study of insect injuries to forest trees and forest products, factors influencing their occurrence and the general principles of control work.

The course in Forestry; junior year; second semester; 3 credits.

Fee: \$1.00.

305. Forest Entomology. A continuation of course 304.

The course in Forestry; senior year; first semester; 2 credits; hours to be arranged.

Prerequisite: Entomology 304.

Fee: \$1.00.

306. Advanced Entomology. This course is designed for those who desire to specialize in Entomology. The instruction includes lectures and reference reading on the biology of the principal families of insects, supplemented by laboratory studies of typical life-histories. Considerable time is devoted to studying the habits of insects, particularly injurious species in the field; to collecting, rearing, mounting, and classifying them; and to becoming familiar with Entomological methods and literature.

Required in the course in Entomology, elective in the courses in Agriculture; junior year; first semester; three credits; one lecture; two laboratory periods.

Fee: \$1.00.

307. Advanced Entomology. A continuation of course 306.

Required in Entomology, elective in the courses in Agriculture; junior year; second semester; 3 credits; 1 lecture; 2 laboratory periods.

308. Advanced Entomology. A continuation of courses 306 and 307.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; first semester; 5 credits; 2 lectures; 3 laboratory periods.

Fee: \$1.00.

309. Advanced Entomology. A continuation of courses 306, 307, and 308.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; second semester; 5 credits; 2 lectures; 3 laboratory periods.

In connection with courses 306, 307, 308, and 309, the student will be required to present a thesis detailing the results of a systematic study of some restricted group of insects, or of the biology of some particular species or group of species.

Fee: \$1.00.

310. Household Entomology. A study of insects in their relation to pharmacy and to the household. The history and development of insects in medicine, insects in relation to disease, and insect pests of dwellings and stores. Control methods will be taken up in detail. This course is intended to prepare students in Pharmacy and Home Economics intelligently to understand the bearing of insects upon the household and community, and the principles underlying methods of control.

Primarily for Pharmacy students; open to students in Home Economics and to others by special permission; no prerequisite. Two credits; two lecture periods.

Fee: \$1.00.

311. Beekeeping. A course in the theory and practice of keeping bees for profit and in relation to fertilization of orchard trees. The College has an apiary in which students will be able to become fully acquainted with modern apicultural methods.

Elective in courses in Agriculture and Home Economics; second semester; 1 credit; 1 laboratory period.

Fee: \$1.00. Text: Phillips: Beekeeping.

312. Problems in Forest Entomology. This course will include the study and application of methods of forest insect investigations. Each student will be assigned a practical problem in Forest Entomology to work out under direction.

Credits to be arranged.

Fee: \$1.00.

313. Problems in Forest Entomology. A continuation of course 312.

Prerequisite: Entomology 312.

Credits to be arranged.

314. Seminar. Senior and graduate students in Entomology. Reading, discussing, and abstracting the leading articles on Entomology as they appear in the scientific journals, horticultural press, current magazines, and experiment station literature.

Senior year; first semester; 1 credit.

Fee: \$1.00.

315. Seminar. A continuation of course 310.

Senior year; second semester; 1 credit.

Fee: \$1.00.

FARM CROPS

GEORGE ROBERT HYSLOP, Associate Professor
HARRY AUGUST SCHOTH, Instructor

This department deals with the various problems of production, improvement, marketing, manufacture, and uses of each of the field crops produced for food, forage, textile, medicinal, and special purposes. The field is a large one and deals principally with well-known and staple crops that are constantly in use and in demand. The work is closely associated with the daily food supply of man and beast, and is of importance to all students of agriculture.

The purpose of the work is primarily to teach students scientific, practical, and economical crop production, and improvement methods that may be put into actual use on the farm. In addition, the courses are so arranged that men may fit themselves for civil service or experiment station work, or for extension or teaching work. The object is to turn out men with a broad training on general lines and well finished in Farm Crops.

Equipment. The department has excellent recitation and well-lighted laboratory rooms. The laboratory is equipped with modern

desks and tables for crop study. Gas, water, and electricity are available for general use. Special equipment consists of compound and binocular microscopes, dissecting and hand lenses, for study of crop structures and crop products; analytical and torsion balances for accurate weights; seed sampler; standard and Semper's type germinators for seed studies; and large collections of cereal, grass, and miscellaneous straw and seed specimens for class use. Grain testers, a Brown-Duvel moisture tester, a drying oven, and extensive collections of standard grain grades and corn-ear samples, provide excellent facilities for grain standardization and judging work.

The Experiment Station plots offer excellent opportunities for field study and make possible extensive collection of valuable material for class work. In addition to the above, a large collection of the best books, periodicals, etc., dealing with the subject, is available.

COURSE IN FARM CROPS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Plant Chemistry (Chem. 510)		2
Agricultural Bacteriology (Bact. 501)	3	
Principles of Plant Pathology (Bot. 101)	2	
Diseases of Field Crops (Bot. 105)	1	
Introductory Entomology (Ento. 301)	2	
Cereal Crops (Farm Crops 57)	4	
Land Drainage (Drain. & Irr. 1)		3
Crop Improvement (Farm Crops 15)		3
Soil Physics (Soils 3)		4
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Elective		3
	—	—
	17	17

Senior Year	Semester	
	1st	2nd
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Agrostology (Farm Crops 11)		3
Forage Crops (Farm Crops 9)	2	
Soil Fertility (Soils 7)	3	
Farm Management (Farm Mgt. 1)		3
Advanced Crop Breeding (Farm Crops 17)	2	
Advanced Crop Work (Farm Crops 23)		2
Feeds and Feeding (A. H. 23)		3
Potato Growing (Farm Crops 13)	1	
Approved Electives	5	2
	16	16

The following courses are offered:

A. Farm Crops. A practical course dealing with soil and climatic adaptations; seed selection, care, testing, and judging; seed-bed preparation, planting, culture, and harvest; storage, market, and improvement methods for the important farm crops of various sections of Oregon. Seed treatment, practical methods of weed eradication, and control and prevention of field-crop pests.

Vocational year; second semester; 3 credits; 2 recitations, 1 laboratory period.

1. Crop Production. The beginners' course, consisting of lectures and recitations on description, adaptability, seed-bed preparation; selection, storage, treatment, testing, and planting of seed; cultural methods; habits of growth; harvest, preservation, storage, marketing, and uses of the leading cereal, forage, and special field crops. Laboratory work consists of studies of purity and germination of seed, methods of testing, seed cleaning, and seed treatment, corn and seed judging. Practical work consists of studying crop problems in the field on the College farm.

Freshman year; either semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$0.50.

3. Semi-Arid Crop Production. A course dealing with special methods and problems of dry-land and irrigated crop production. Varieties, adaptability, special cultural methods, harvest, yields, etc., for grain and forage crops under semi-arid conditions, are

considered. Recommended as an elective for students from semi-arid sections who cannot take Cereal Crops (Farm Crops 5) and Agrostology (Farm Crops 11).

5. Cereal Crops. A study of the production of cereal and allied grains from seed to market. Especial attention is given to varieties, their distribution and adaptability, methods and conditions for production, quality as affected by environment, markets, manufacture, and uses of wheat, oats, corn, rye, and less important cereals, and their enemies and control. Laboratory work consists of studies of varieties, their identification before and after threshing, cereal judging, grain standardization, moisture and gluten and hardness testing, conditions affecting germination, weight per bushel, etc.

Junior year; 1st semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$0.50. Texts: Carleton: Small Grains. Montgomery: The Corn Crop.

7. Cereal Crops, Lectures. Series of lectures covering same field as the lecture and recitation work of course 5. Especially adapted to the needs of junior students majoring in "Soils."

Junior year; first semester; 2 credits; 2 lectures.

9. Forage Crops. A study of legumes, grasses, and succulent crops adapted to the work of students in agriculture. Temporary pasturing systems, seeding, care, and maintenance of permanent pasture; reseeding and care of range. Adaptability, culture, methods of handling, and value of various crops for forage. Silage and hay making. Soiling crop rotations. Storage and marketing.

Elective; junior or senior year; first semester; 2 credits; 2 recitations.

Fee: \$0.50. Text: Piper: Forage Crops.

11. Agrostology. A study of the grasses, legumes, and other forage and seed crops. Methods of seeding, production, harvesting, and marketing of meadow, pasture, cover, and special crops for seed, fiber, and special purposes other than forage. The comparative structure and identification of the different forage plants, their adaptability to different conditions of soil and climate. Examinations of commercial seed for viability and purity. The identification of weed seed. The production of forage-crop seed.

Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$0.50. Texts: Piper: Forage Plants. Hitchcock: A Text-book of Grasses.

13. **Potato Growing.** A detailed study of potato soils, culture, harvest, improvement, storage, markets, distribution, uses, and manufacture. Varietal studies and identification. Potato judging and scoring.

Elective; junior or senior year; 1st semester; 1 credit; 1 recitation.

Fee: \$0.50.

15. **Crop Improvement.** Studies of practical means of improving farm crops in quality and yield; field selection; mechanical and score-card methods of seed selection; variety testing; head and ear-to-row methods; multiplication; and pure-seed production. Hybridization and plant-breeding laws applicable to practical crop improvement. Laboratory and field work consists of studies of transmission of characters, field selection, planning and planting of plots, hybridization methods, etc.

Junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$0.50. Text: Bailey & Gilbert: Plant Breeding.

17. **Advanced Crop Breeding.** An advanced course dealing with field-crop breeding from a more theoretical view point. Hybridization, variability, and its measurement. Transmission of characters. Behavior of characters of specific crops. A course designed for students desiring to enter plant-breeding work.

Senior year; first semester; 2 credits; 2 recitations.

19. **Seed Testing.** A course for students preparing themselves for private, state, or government seed-testing work. Studies are made of seed identification and germination, seed legislation, and standard methods of seed testing. Students electing this course should take Taxonomy of Weeds and Grasses (Botany 45), and Agrostology (Farm Crops 11).

Senior year; first or second semester; 2 credits; 2 laboratory periods.

Fee: \$0.50.

21. **Weed Eradication.** This course deals with weed types and habits of growth, weed laws, and the various practical methods of prevention, control, and eradication. Special attention is paid to noxious, persistent, perennial, and poisonous weeds of ranch and range.

Elective; junior or senior year; first semester; 1 credit; 1 recitation.

23. Advanced Crop Work. Lecture or laboratory work or both will be offered to groups of students desiring additional work in various lines of crop production. Suggested topics are sugar beets, hops, flax, seed testing, grain standardization, experimental methods, etc. Individual students desiring special work will be assigned to some practical problem involving experimental or research work and the preparation of a thesis.

Elective; senior year; either semester; 1 to 5 credits.

Fee: 50c.

24. Advanced Crop Work. Continuation of course 23 for students who wish to elect two semesters of this advanced work.

Elective; senior or graduate year; either semester; 1 to 5 credits.

Graduate Work. Candidates for advanced degrees majoring in Farm Crops will be assigned some specific problem of a practical nature requiring careful original work. Result of laboratory and field work, together with a review of the literature of the subject, must be embodied in a suitable thesis.

Graduate year; either semester or both; credits to be arranged.

FARM MECHANICS

WILLIAM JAMES GILMORE, Assistant Professor

The purpose and scope of the work in Farm Mechanics is indicated fully in the description of courses given below.

Equipment. The Farm Mechanics building is complete for Farm Mechanics work. It is an attractive, well-lighted, brick building, having a large operating floor, a class room, locker room, shop and tool rooms on the first floor. The operating room is used for displaying the heavier farm machines and for indoor operation of tractors and automobiles. A gallery surrounds this operating floor and provides space for the lighter farm machines, such as tillage, haying, and harvesting machines, and manure spreaders, many of which are operated from a line shaft.

A very large equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest, so that the student has constantly before him and is working with and studying the very best farm machines

of all types. Plows, harrows, pulverizers, rollers, cultivators, corn planters, potato planters and diggers, grain and grass seeders, mowers, rakes, hay loaders, corn and grain binders, sprayers and manure spreaders, ensilage cutters, hay balers, and threshing machines, are representative machines found in the laboratory. The large, well-lighted gas-engine laboratory contains many different makes of gas engines and accessories, such as sectional carburetors, magnetos, and lubricators. In addition to this equipment is the large selection of grain-cleaning and crushing machines, farm-lighting plants, pumps, rams, and water-supply equipment.

The laboratory is also equipped with two large brakes for the testing of tractors; dynamometers for determining the draft of the field machines and the draw-bar horse power of tractors, and also a gas and steam indicator for determining the efficiency of farm engines and tractors; and an electric motor and watt meter, so that the student may become familiar with the power requirements of belt-driven farm machines.

COURSES IN FARM MECHANICS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
*Electives	12	15
	17	17
Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
*Electives	13	13
	16	16

The following courses are offered:

A. Farm Machines and Engines. A general course in Farm Mechanics. The more important field machines and gasoline engines are studied. Farm buildings, concrete work, rope work, etc., are also given attention.

*Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

One-year course; first semester; 3 credits; 1 recitation; 2 laboratory periods.

1. General Farm Mechanics. Concrete construction on the farm, farm water supply, detailed and comparative study of field machines, assembling and adjusting field machines, crushing and cleaning machinery, threshing machinery, heating farm homes, power requirements of belt-driven machines, field tests showing draft and effects of mis-adjustments in field machines, farm fences, selection and care and adjustments of farm machines, demonstrations of tractor for field operations, farm gas and electric lighting.

Elective; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

Fee: \$1.50. Deposit: \$1.00. Text: Davidson: Farm Machines and Farm Motors.

3. Farm Power Machinery. Detail and comparative study of farm gas engine. Construction and operation of engine. Study of carburetors, ignition, governing, and cooling systems, lubricants and lubrication. Testing, adjusting, and trouble hunting. Detail study and power requirements of belt-driven machines, such as crushers, ensilage cutters, etc. Pumping machinery and hydraulic ram. Pipe fitting, babbitting, soldering, belt lacing, and valve grinding.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

Fee: \$2.00. Deposit: \$1.00. Text: Gas Engine on The Farm.

5. Farm Motors and Tractors. Detail study of gas and steam tractors; starting and operating, carburetors, lubricators, ignition systems. Valve setting on steam engines; flue repair. Electricity in its adaptation to farm uses. Indicated, brake, and drawbar horse-power tests of tractors.

Prerequisite: Farm Mechanics 3.

Elective; senior year; either semester; 3 credits; 1 recitation; 2 laboratory periods.

Fee: \$2.00. Deposit: \$1.00.

7. Dairy Mechanics. Concrete floors and sidewalks, concrete bases for machines, detailed study of gas engine operation; trouble hunting and tests of gas engine; gas engine accessories; study of steam boilers and steam engines; firing and operating steam engines; lubricators; injectors; magnetos; flue repair.

Elective; junior or senior year; either semester; 1 credit; 1 3-hour laboratory period.

Fee: \$1.00. Deposit: \$1.00.

9. Orchard Machinery. Given to Horticultural students from the mechanical standpoint, and includes study of construction, operation, and efficiency of orchard machinery, such as gas engines, pumps, tillage and seeding implements. Orchard plowing and cultivation. Demonstration of tractor for orchard work. This course is intended only for students who cannot take the regular courses in Farm Mechanics.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods.

Fee: \$1.50. Deposit: \$1.00.

11. Farm Practice. A field practice course for students who have had no farm experience. Practically all the time is spent in the field, carrying on ordinary farm operations, such as plowing, seeding, cultivating, haying, and threshing.

13. Advanced Farm Mechanics. For students with inclinations toward mechanics and who feel that more work is needed than was obtained in courses 1, 3, and 5. This course includes efficiency tests of gas and steam tractors (indicated, brake, and drawbar), plowing with tractors, power requirement tests of belt-driven machines with electric motor and watt meter, automobile study and operation, magnetos, self-starters, farm lighting, concrete construction, binder adjustments, dynamometer tests of various field machines.

Prerequisites: Farm Mechanics 1, 3, and 5.

Elective; senior or graduate year; either semester; 1 or 2 credits.

Fee: \$2.00. Deposit: \$1.00.

14. Advanced Farm Mechanics. Continuation of course 13 for students who wish to take the second semester of this advanced work.

Elective; senior or graduate year; either semester; 1 or 2 credits.

HORTICULTURE

CLAUDE ISAAC LEWIS, Professor
VICTOR RAY GARDNER, Professor of Pomology
*EZRA JACOB KRAUS, Professor of Research
ARTHUR LEE PECK, Associate Professor
ARTHUR GEORGE BOUQUET, Assistant Professor
WALTER SHELDON BROWN, Assistant Professor (Ext.)
CARL EPHRIAM SCHUSTER, Instructor
ALDEN FORREST BARSS, Instructor
ROY EDGAR MARSHALL, Instructor
JOHN ROBERT MAGNESS, Instructor
SAMUEL KILBOURN WHITE, Teaching Fellow

The scope of the work in Horticulture is very broad, giving instruction in Pomology, Olericulture, Floriculture, Landscape Gardening, School Gardening. In these courses the student is first thoroughly grounded in the fundamentals, and is then allowed to specialize as he may desire. He may thus fit himself for station or government work, or prepare for the many lines in horticultural business, such as fruit growing, truck gardening, floriculture, or landscape gardening; for in all these lines there are splendid opportunities throughout the Pacific Northwest. At the present time there are openings for young men to become managers of orchards or to develop fruit lands for outside investors; those having a taste for teaching, can find a broad field in college or rural work or as supervisors of horticulture.

The required work for students electing horticulture covers a wide range, giving the student a thorough training, not only in plant propagation and the general principles of orchard management and vegetable growing, but in floriculture and landscape gardening as well, thus broadening his views and interesting him in the aesthetic and all that pertains to more beautiful surroundings.

The courses consist of lectures, reference reading, field exercises, and laboratory work. Much stress is placed upon the practical phases of all the work. In all courses horticultural truths are illustrated by practice, whenever possible. Students are given field and laboratory exercises in all such operations as planting, seeding, budding, grafting, cultivating, thinning, pruning, harvesting, and spraying.

The Horticultural Building contains modern laboratories for spraying, plant propagation, fruit packing, systematic pomology,

*On leave of absence.

and vegetable preparation. There are special class rooms, large draughting rooms, museum, and research laboratories. A new floriculture building and range of greenhouses assist materially in the work. The department is also establishing young orchards and vegetable gardens, and has at its disposal a large campus upon which are planted many species of trees and shrubs. The student is materially assisted in all of his work, and the research work especially, by the large additions that have recently been made to the horticultural library.

Equipment. The Horticultural wing of the Agricultural building contains many spacious rooms, and thoroughly modern equipment for teaching the various subjects. In the basement will be found a large spray laboratory furnished with gas and water and all the equipment, chemicals, and apparatus which are necessary to teach students the proper mixing and testing of the different sprays; accommodations are offered also for the testing of nozzles and spraying apparatus. The department has a large number of hand and power spraying outfits that are placed at the disposal of students.

A large, well-lighted plant-propagation laboratory offers unexcelled opportunities for the study of plant propagation. Specially equipped cabinets, tables, and incubators have been constructed; so that the students can handle to advantage such topics as seedage, layerage, making of cuttings, and budding and grafting.

A laboratory has been especially fitted for the use of students in gardening. It contains large cement-set tubs, where students are taught the proper methods of preparing vegetables for market. This room also contains a demonstration earth bed for use during the winter, to show how the various tools for planting seed and for cultivation are used. The demonstration bed also allows the instructor to demonstrate the proper method of interplanting and transplanting of plants.

In the basement is also located a very large fruit-packing laboratory, equipped with fruit presses, packing and grading tables. The large storage rooms are also located in the basement and include a suite of rooms which are chilled by mechanical refrigeration.

On the first floor a systematic pomology laboratory is especially equipped for the study of nuts, fruits, etc. A special research laboratory, found on this floor, is used for research assistants in

the department, and is also at the disposal of advanced students. This room is completely equipped with ovens, microscopes, and similar apparatus necessary for extensive research work.

On the top floor is the horticultural museum, which is found to be of great value, as in this room are stored all sorts of equipment used in Horticulture, such as pruning shears, budding and grafting utensils, prune-drying apparatus, fruit graders, etc. The department also has on this floor an herbarium which is especially supplied with the plants used in Horticulture. On this floor is also found a large draughting room, extending along the entire south end of the building, supplied with tables, cabinets, etc., for the use of students studying Floriculture, Landscape Gardening, and Greenhouse Construction, Orchard Planting, and Packing House Construction. In addition to these rooms, the department has four large lecture rooms. A balopticon with a good collection of lantern slides, and a large library, add materially to the equipment.

The department is also especially provided with tools and apparatus necessary for conducting field exercises in Truck Gardening, Floriculture, Landscape Gardening, and Pomology.

COURSES IN HORTICULTURE

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

(a) Pomology

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Floriculture (Hort. 401)	2	
Landscape Gardening (Hort. 301)		2
Plant Propagation (Hort. 105)		2
Practical Pomology (Hort. 102)	2	
Orchard Practice (Hort. 103, 104)	2	2
Plant Physiology (Bot. 50)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	6	6
	<hr/>	<hr/>
	17	17

	Semester	
	1st	2nd
Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Systematic Pomology (Hort. 115)	4	
Commercial Pomology (Hort. 117)		2
Introductory Entomology (Ento. 301)	2	
Entomology of Orchard and Small Fruits (Ento. 302)....		2
History and Literature of Horticulture (Hort. 125)		2
Seminar (Hort. 123, 124)	1	1
Principles of Plant Pathology (Bot. 101)	2	
Diseases of Orchards and Small Fruits (Bot. 102)		2
Approved Electives	5	5
	17	17

(b) Olericulture

Junior Year		
Agricultural Economics (Com. 219)	3	
Plant Propagation (Hort. 105)		2
Practical Vegetable Gardening (Hort. 203, 204)	3	3
Floriculture (Hort. 401)	2	
Landscape Gardening (Hort. 301)		2
Introductory Entomology (Ento. 301)	2	
Entomology of Truck and Field Crops (Ento. 303)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	5	5
	17	17

Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Commercial Truck Gardening (Hort. 209, 210)	3	3
Forcing Vegetables (Hort. 205, 206)	2	2
Systematic Olericulture (Hort. 207)	1	
Seminar (Hort. 123, 124)	1	1
Principles of Plant Pathology (Bot. 101)	2	
Diseases of Vegetable Crops (Bot. 104)		2
Approved Electives	4	5
	16	16

HORTICULTURE

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(c) Floriculture	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Floriculture (Hort. 401)	2	
Landscape Gardening (Hort. 301)		2
Plant Materials (Hort. 305, 306)	3	3
Greenhouse Construction (Hort. 403)		3
Introductory Entomology (Ento. 301)	2	
Entomology of Truck and Field Crops (Ento. 303)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	4	4
	17	17

Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Forcing Flowers (Hort. 405, 406)	3	3
Agricultural Bacteriology (Bact. 501)	3	
Forcing Vegetables (Hort. 205, 206)	2	2
Advanced Plant Breeding (Hort. 127, 128).....	3	3
Diseases of Vegetable Crops (Bot. 104)		2
Approved Electives	2	3
	16	16

(d) Landscape Gardening		
Freshman Year		
Modern English Prose (Eng. 81, 82)	3	3
Plane Surveying (C. E. 222)		5
Modern Language (French, German, or Spanish, first Yr.)	3	3
Agricultural Botany (Bot. 41, 42)	3	3
Trigonometry (Math. 11)	3	
Architectural Drawing (Arch. 601)	3	
Drill (Military 1, 2)	1	1
Library Practice (Libr. 1)		½
Hygiene (Phys. Ed. 10)		½
Gymnasium (Phys. Ed. 15, 16)	½	½
Approved Elective	1	1
	17½	17½

	Semester	
	1st	2nd
Sophomore Year		
American Literature (Eng. 71, 72)	3	3
Modern Language (French, German, or Spanish, second Yr.)	3	3
Topographic Surveying (C. E. 223)	5	
Railroad and Canal Surveying (C. E. 272)		5
Principles of Fruit Growing (Hort. 101 a).....	2	
Fundamentals of Land. Gard. (Hort. 101 b)	1½	
Landscape Gardening (Hort. 301)		2
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	½	½
Approved Electives	3	4
	<hr/>	<hr/>
	18½	18½
Junior Year		
Agricultural Economics (Com. 219)	3	
Composition of Addresses (Eng. 103, 104)	2	2
Water Color Rendering (Arch. 505, 506)	2	2
Floriculture (Hort. 401)	2	
Plant Materials (Hort. 305, 306)	3	3
Hist. and Lit. of Landscape Architecture (Hort. 311).....		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	3	6
	<hr/>	<hr/>
	17	17
Senior Year		
National Government (Com. 320)	3	
Constitutional Law and Politics (Com. 322)		3
Theory and Design (Hort. 307, 308)	2	3
Town Planning (Hort. 313)	3	
Field Practice (Hort. 309, 310)	3	3
Approved Electives	5	7
	<hr/>	<hr/>
	16	16

*It is suggested that four of these elective credits be taken in Architectural drawing and Perspective, such as Arch. 602, Arch. 518.

The following courses are offered:

A. Horticultural Practice. Practical fruit growing, dealing with such subjects as the choice of locations, sites, soils, and varieties; the establishment of orchards, including staking, setting trees; the maintenance of the orchard, including such topics as tillage, maintaining orchard fertility, thinning, pruning, spraying; the propagation of the principal fruits, and the study of the most common methods of budding and grafting; handling the fruit crop, including picking and packing.

One-year course in Agriculture; first semester; 5 credits; 3 recitations; 2 laboratory periods.

B. Horticultural Practice. Continuation of Course A. The greater part of the work, however, will be devoted to vegetable gardening and landscape gardening. The first part of the semester will be devoted to a fundamental study of vegetable gardening, and will deal with such problems as the choice of soils and locations; production of plants, including problems connected with the use of manures and fertilizers, irrigation, tillage, etc.; the harvesting and market preparation and disposal of vegetable products. The latter part of the semester will be devoted to a fundamental study of landscape gardening; and will deal with the fundamental principles and their application in beautifying the farm home.

One-year course in Agriculture; second semester; 5 credits; 3 recitations; 2 laboratory periods.

The sophomore's required work in Horticulture allows 3 credits in the first semester, and 2 in the second semester. The work is divided into three parts: namely, Pomology, Landscape Gardening, and Vegetable Gardening.

The work in Pomology, designated as 101 a, is given the first semester, extending only to the Christmas holidays, for which 2 credits will be allowed.

The work in Landscape Gardening, designated as 101 b, begins after the Christmas holidays, and extends to the end of the second week in March, for which 1½ credits will be allowed. Registration for this course should be arranged with the first semester registration in September.

The work in Vegetable Gardening, designated as 201, begins with the third week in March and extends to the end of the second semester, for which 1½ credits will be allowed. Registration for

this course should be arranged with the second semester's registration in February.

Any student completing a single third of the course will be allowed separate credits.

101-a. Principles of Fruit Growing. This includes the problems incident to the establishing of an orchard. It embraces a consideration of such questions as locations, site, soils, windbreaks, variety selection, selection of nursery stock, and planting. Some attention is also given to problems incident to maintenance, especially the maintenance of the home orchard. It is designed especially for general agricultural students, who are interested mainly in the orchard as an accessory of the general farm. At the same time, it is a fundamental course for students desiring to pursue other horticultural studies.

Required of all Agricultural students; sophomore year; 2 credits; 3 recitations; 1 laboratory period.

Fee: \$1.50. Text: Sears: Productive Orchardng.

101-b. Fundamentals of Landscape Gardening. This course consists of a series of lectures and practicums dealing with the beautifying of the farm home and rural public buildings. It begins after the Christmas holidays and extends to the end of the second week in March. Registration for the course should be arranged in September.

Required of all Agricultural students; sophomore year; 1½ credits; for the remainder of the first semester, 3 recitation and 1 laboratory period; for the first part of the second semester, 1 lecture and 1 laboratory period.

Fee: \$1.50. Text: Sears: Productive Orchardng.

Pomology

102. Practical Pomology. A continuation of course 101. It deals especially with the problems incident to the maintenance of the commercial orchard, including a study of such questions as cover crops, fertilization, irrigation, frost occurrence and prevention, pollination, pruning, thinning, spraying, and spray injury.

Required of students majoring in Pomology; junior year; first semester; 2 credits; 3 recitations.

Text: Bailey: The Pruning Book.

103. Orchard Practice. A laboratory course in which the student obtains actual practice in regular orchard and packing-house

operations. The work includes tree planting, pruning, the preparation of spray solutions, a study of spray machinery, orchard spraying, orchard heating, and the picking, grading, packing, and judging of fruits.

This course is open only to those who have taken or are taking course 102.

Required of juniors majoring in Pomology; junior year; first semester; 2 credits; 1 laboratory period of four hours scheduled for Saturday forenoons.

Fee: \$1.00.

104. Orchard Practice. A continuation of course 103.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 laboratory period of four hours, scheduled for Saturday forenoons.

Fee: \$1.00.

105. Plant Propagation. A study of the propagation of plants by means of seeds, separation, and division, layerage, cuttage, and graftage. Sufficient attention is given the subject of nursery management to acquaint the student with its more important features.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 recitation; 2 laboratory periods.

Fee: \$1.00.

109. Viticulture. A study of the problems pertaining to the growing, harvesting, and marketing of both the American and European types of grapes. Soils, locations, pruning, training, harvesting, grading, packing, storage, etc., are some of the questions receiving attention.

Elective; open to juniors and seniors; second semester; alternate years; (not given in 1916); 2 credits; 2 recitations.

111. Small Fruit Culture. A study is made of the problems connected with the growing, harvesting, and marketing of such fruits as the strawberry, currant, gooseberry, raspberry, blackberry, loganberry, and cranberry.

Elective; open to juniors and seniors; second semester; 2 credits; 2 recitations.

113. Nut Culture. A study of the methods of growing, harvesting, curing, and marketing of such nut crops as the walnut, filbert, almond, and pecan. In the laboratory a detailed study is made of the leading varieties of these different nuts.

Elective; open to juniors and seniors; second semester; alternate years (to be given in 1916); 2 credits; 1 recitation; 1 laboratory period.

115. Systematic Pomology. A study of the principles underlying pomological nomenclature and variety description, classification, and adaptation. A critical study is made of many varieties of fruits, of the influence of environment upon behavior of fruit trees and the development of their products. The student becomes acquainted with the more important fruit groups and their interrelationships.

Required of seniors majoring in Pomology; senior year; first semester; 4 credits; 2 recitations; 3 laboratory periods.

117. Commercial Pomology. The problems of handling fruit, including the picking and grading and packing of fruits; a study of the problems of transportation, storage, distribution, and marketing. Considerable attention will also be given to the planning of buildings for the packing and storing of fruit.

Required of seniors electing Pomology as a major; senior year; second semester; 2 credits; 2 recitations.

119. Sub-Tropical Pomology. This course takes up in detail the problems concerned with the growing and marketing of such sub-tropical fruits as oranges, figs, olives, pineapples, etc.

Elective; senior year; first semester; 2 credits; 2 recitations.

121. Advanced Pomology. A finishing course in pomology. The students will first be given a general review to determine their knowledge of pomology. The course is designed especially to fit students for Civil Service examinations. The latter part of the course will be devoted to the study of some advanced problems in pomology, and will also include a study of orchard costs and economics, the cost of production, and marketing.

Elective; senior year; second semester; 3 credits; 3 recitations.

123. Seminar. A course especially arranged for senior and graduate students in Horticulture. A study is made of some of the advanced problems. Articles from the leading magazines on horticultural subjects, as well as station and Government publications, are reviewed.

Required of Agricultural seniors and advanced students having their major in Horticulture; senior year; first semester; 1 credit; 1 two-hour recitation.

124. Seminar. Continuation of course 123.

Prerequisite: Course 123.

Required of seniors electing Pomology as a major; senior year; second semester; 1 credit; 1 two-hour recitation.

125. History and Literature of Horticulture. A study is made of the literature and history of Horticulture from the time of the Egyptians to modern times.

Required of seniors electing Pomology as a major; senior year; second semester; 2 credits; 2 recitations.

Fee: \$3.00.

126. Advanced Orchard Practice. This course will deal with problems of pruning, spraying, budding, and grafting. It will consist entirely of field work or laboratory exercises. Work will be conducted not only at Corvallis, but in various other sections of the State. The course is especially offered for those students who have had regular orchard-practice work, and who have the qualifications to enable them to secure benefit from the course.

Students can only be registered by appointment with the head of the department. Schedule by arrangement in four-hour periods on Saturdays. Work will commence January 1 and extend to May 1.

2 credits; 1 laboratory period.

127. Plant Breeding. The principles of breeding. A study of some of the facts pertaining to variation, classification of variations, causes of variation, and the theories that have been advanced to explain the inheritance of characters. The class room work will consist of lectures, reference readings, and recitations; the laboratory work will acquaint the student with statistical methods of studying variation; and through greenhouse experiments he will become acquainted with some of the ways in which environment influences plant growth.

Elective; open to seniors and graduate students (and to juniors by special permission); first semester; 3 credits; 3 recitations; 1 laboratory period.

Text: Davenport: Principles of Breeding.

128. Plant Breeding. A continuation of course 127. A study of breeding systems and recent breeding work. For the laboratory work, each student will be assigned to some problem that will give him a knowledge of the technique involved in plant breeding

studies, and of the methods that are employed in plant breeding investigations.

Elective; open to seniors and graduate students (or to juniors by special permission); second semester; 3 credits; 2 recitations; 2 laboratory periods.

Text: Davenport: Principles of Breeding.

Vegetable Gardening

Students taking their major in this course are required to take Horticulture 301 and 401.

201. Vegetable Growing. This course is offered for the purpose of teaching the student the value of a well-conducted farm or home vegetable garden, serving especially those students who cannot further pursue a horticultural course. At the same time, the work will be fundamental in the instruction of higher courses in commercial vegetable growing and marketing, for those students who desire to pursue work in this branch of Horticulture.

Required: sophomore year; second semester; 1½ credits; 1 lecture; 1 laboratory period. Work begins the third week in March. Registration should be arranged at opening of second semester.

Fee: \$1.00. Text: Lloyd: Productive Vegetable Gardening.

203. Practical Vegetable Gardening. This course is offered to those students wishing to learn the fundamentals of the business of vegetable gardening. The practices of the leading commercial growers in all phases of field management will be studied, including such problems as vegetable soils, locations, production of plants, distribution of crops, successions, rotations, manures and fertilizers, irrigation, implements, capital, labor, and other vital factors in the management of a commercial vegetable farm.

Required of juniors electing Vegetable Gardening as a major; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

204. Practical Vegetable Gardening. A continuation of the above course, designed especially for those who are specializing in vegetable growing. Course 204 offers work dealing with the methods used in the commercial production of vegetables for market, consisting largely of practicums in field and greenhouse so as thoroughly to acquaint the student with proper methods and management. The commercial testing grounds, trips to vegetable farms,

and the College greenhouses give ample opportunities for the student to fit himself for later commercial work.

Required of juniors electing Vegetable Gardening as a major; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

Text: Corbett: Garden Farming.

205. Forcing Vegetables. The problems connected with the forcing of such vegetables as lettuce, cucumbers, tomatoes, rhubarb, and melons, in cold frames, hotbeds, and greenhouses. Lectures and exercises in the greenhouses.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 2 credits; 1 lecture; 1 laboratory period.

206. Forcing Vegetables. Continuation of course 205.

Prerequisite: Horticulture 205.

Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

207. Systematic Olericulture. Description, nomenclature, and classification of vegetables. Exercises are given in displaying and judging vegetables.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 1 credit; 1 laboratory period.

209. Commercial Truck Gardening. Only the purely commercial aspects of market gardening and trucking are offered in this course. Problems of growers in the production of vegetables on an extensive scale for market and cannery will be considered. Students will be fitted by this course for extensive or intensive operations, and for managerial positions. Particular attention will be paid to modern methods of marketing vegetables; and the economics of producing vegetable crops will be treated in lectures and discussions.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

210. Commercial Truck Gardening. A continuation of course 209.

Prerequisite: Horticulture 209.

Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Landscape Gardening

(For the first course in Landscape Gardening, see Pomology 101-b.)

301. Landscape Gardening. All students should be interested in everything that pertains to the decoration of the home, the improvement of school grounds, the beautifying of streets, and the establishment of recreation grounds and parks. In the course in Landscape Gardening the general principles of this are so treated as to apply to the up-building of the aesthetic in everyday life.

Required of Agricultural juniors electing Horticulture as a major; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

303. Tree Surgery. The principles of tree surgery are presented and put into execution in the laboratory. All the varying cuts, cavities, fillings, bracing, and cultivating will be worked out in a practical manner.

Elective; junior year; first semester; 1 credit; 1 laboratory period.

304. Tree Surgery. A continuation of course 303.

Elective; junior year; second semester; 1 credit; 1 laboratory period.

305. Plant Materials. To create satisfactory landscape effects, one must have a broad knowledge of the materials with which landscape architects must work. A thorough study is given to trees, both evergreen and deciduous, shrubs, vines, perennial herbaceous plants, biennials and annuals, with a view to bringing out their characteristics, such as foliage, color, form, adaptation, hardiness, and artistic effect.

Prerequisite: Horticulture 301.

Elective; junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

306. Plant Materials. A continuation of course 305.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

307. Theory and Design. A study of the best works of prominent landscape architects, together with a wide range of collateral reading bearing upon the various problems. Private estates, public parks and play grounds, boulevards, and cemeteries will be carefully studied. Reports, such as those of park boards and landscape architects, will also be studied.

Prerequisites: Horticulture 301, 305, 306.

Elective; senior year; first semester; 2 credits; 2 laboratory periods.

308. Theory and Design. A continuation of course 307, in which a large portion of the time will be devoted to the preparation of planting plans. Outside time will be required for collateral reading.

Prerequisites: Horticulture 301, 305, 306, 307.

Elective; senior year; second semester; 3 credits; 3 laboratory periods.

309. Field Practice. A course in practical problems brought in from the field of practice. The student is required to make the surveys, do the engineering work incidental to the solving of the problem, make general plans, planting plans, grading plans, details, and, in short, perform all the duties ordinarily met with in the landscape architect's office.

Prerequisites: Horticulture 301, 305, 306. Civil Engineering required in freshman and sophomore year.

Elective; senior year; first semester; 3 credits; 3 laboratory periods.

310. Field Practice. A continuation of course 309.

Prerequisites: Horticulture 301, 305, 306, 309. Civil Engineering required in freshman and sophomore year.

Elective; senior year; second semester; 3 credits; 3 laboratory periods.

311. History and Literature of Landscape Architecture. Designed to give the student a good idea of the development of the art, and to bring him into close touch with the literature, past and current, that is related to the subject.

Elective; senior year; second semester; 2 credits; 2 recitations.

313. Town Planning. This course is offered in order that the student may understand, in a general way, the underlying ideas of municipal, town, and village improvement. Literature and reports are studied, town problems discussed, and methods of procedure in town improvement worked out.

Elective; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Floriculture

Students taking their major in Floriculture are required to take Horticulture 301 and 401.

401. Floriculture. An elementary course in the cultivation of greenhouse and home plants and of the common annuals and perennials used in outdoor work. The course is designed to broaden the views of those students who are unable to take advanced courses in Floriculture, and to make them more useful citizens.

Required of Agricultural juniors electing Horticulture as a major; first semester; 2 credits; 1 recitation; 1 laboratory period.

Fee: \$1.00.

403. Greenhouse Construction. A course particularly adapted for students specializing in Floriculture and Truck Gardening. The problems connected with the building of greenhouses, hot-beds, and cold frames are dealt with; also the selection of materials; the various systems of heating and ventilating, and the value of the various types of buildings. Lectures and laboratory exercises in greenhouse and draughting room are conducted.

Elective, junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

405. Forcing Flowers. The propagation and problems of culture; such as soils, ventilation, and heat, connected with the forcing of plants used in the florist's trade.

Prerequisite: Horticulture 401.

Elective; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

406. Forcing Flowers. A continuation of Horticulture 405.

Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

501. Floriculture. As related to the cultivation of the common household and dooryard flowers, instruction is given in various subjects; namely, proper soils, planting of seed, transplanting, making of cuttings, cultivation, principles of heating and ventilating and control of insect pests and diseases. In addition, such problems as the grouping and arranging of flowers, so as to obtain the best color harmonies and most pleasing effects while growing, as well as for decoration purposes, are included. The lectures are supplemented by reference reading and laboratory periods in the greenhouse and garden.

Course in Home Economics; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

503. Landscape Gardening. The general principles of Landscape Gardening are taught, the aim being to give the student sufficient foundation to understand landscape gardening as applied to home decoration; to interest the student in the home beautiful; and the improvement of our public school grounds and city and village streets. A study is made of photographs, and of famous landscape paintings, showing good taste and design in various phases of Landscape Gardening. Lectures and reference readings are supplemented by field exercises.

Course in Home Economics; second semester; 2 credits; 1 recitation; 1 laboratory period.

505. Vegetable Gardening and Small Fruit Culture. Care of soil, seeding, rotation, fertilizing, and the selection of the best varieties of vegetables and small fruits for use in the home garden. Lectures, laboratory, and field exercises.

Course in Home Economics; second semester; 3 credits; 2 recitations; 1 laboratory period.

By-Products

601. Horticultural By-Products. A general study of horticultural by-products, including a study of the growth and development of this important industry in this country and abroad, but more especially in the Pacific Northwest. In addition, the course will deal with the establishment of plants, their operation, and the fundamental principles connected with canning, evaporating, drying, and the manufacture of fruit juices.

Elective; junior or senior year; first semester; 1 credit; 1 recitation.

603. Dried Products. A detailed study of the evaporation and drying of fruits and vegetables. It will include a study of the types of buildings now used, and of the machinery and apparatus needed in the successful operation of the various types of driers. This course will also deal with the technique connected with the evaporation and drying and processing of such products as apples, pears, peaches, apricots, berries, and vegetables.

Elective; junior or senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Not offered in 1916-17.

605. Canning. A study of the establishment, management and operation of canneries, including a study of necessary buildings, machinery, and the successful operation of canneries. It will

also include a detailed study of the various methods used in canning, and in the manufacture of syrups, jellies, etc.

Elective; junior or senior year; second semester; three credits; one recitation; two laboratory periods. Not offered in 1916-17.

607. Fruit Juices. A study of the manufacture of cider, vinegars, and juices of such fruits as the apple, grape, and loganberry. A study will be made of the various types of buildings and machinery suitable for the manufacture of such juices, together with the study of the best methods embraced in the manufacture of fruit syrup and juices.

Elective; junior or senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Not offered in 1916-17.

Research

The department of Horticulture is unusually well equipped for offering research work. In addition to the laboratory facilities, there are the greenhouses, experimental plots, and a splendid research library, well supplied with scientific books and periodicals, all combining to give the student unsurpassed facilities.

701. Research Work for Seniors. This course is offered for those seniors who are contemplating following college, experiment station, or Government work as a life career, or for those students who desire to have some special training in research technique. Problems will be assigned to the students which will give them experience in the laboratory, greenhouse, field, and library.

Elective; senior year; first semester; 3 credits.

702. Research Work for Seniors. A continuation of course 701.

Elective; senior year; second semester; 3 credits.

703. Advanced Thesis and Research Work. A course offered only for graduate students. Such students will be allowed to select problems in pomology, vegetable gardening, landscape gardening, floriculture, plant breeding, and the like.

Elective; for graduate students only; first semester; from 10 to 20 credits.

704. Advanced Thesis and Research Work. A continuation of course 703.

Elective; for graduate students only; second semester; from 10 to 20 credits.

705. Methods of Research. This course is offered to graduate or senior students interested in research work. It will be conducted as a research round table. Special drill will be given in the making of briefs and outlines of research problems, in methods of procedure in conducting investigative work, and in the preparation of bulletins and reports. The study of research problems conducted by the department of Horticulture will be taken up, and a close study made of the research work which is presented in bulletins from other institutions.

Elective; senior or graduate students; first semester; 1 credit.

706. Methods of Research. Continuation of course 705.

Elective; senior or graduate students; second semester; 1 credit.

POULTRY HUSBANDRY

JAMES DRYDEN, Professor

ARTHUR CLIFFORD McCULLOCH, Instructor

In recognition of the importance of the poultry industry, and to meet the demands of students who aim to give special attention to this industry after leaving college, the department of Poultry Husbandry was established. Poultry keeping is a part of every well-regulated system of diversified farming, and at the same time offers opportunity for profit-making as a special business under special conditions. The two poultry plants at the College give exceptional opportunities for study of the practical as well as the theoretical side of the poultry industry.

Equipment. The equipment of this department consists of a number of poultry houses of different types; about 1,000 fowls of several breeds and varieties; twenty incubators of several different makes; brooders of different types; hatching, brooding, and colony coops; bone and clover cutters; feed grinders and mixers; cramming machine and fattening batteries; trap-nests; and various other appliances necessary for practical poultry keeping. There are also sets of charts, lantern slides, motion pictures, and photographs, illustrating breeds of fowls, poultry farms, and houses.

COURSE IN POULTRY HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Poultry Husbandry (P. H. 1, 2)	4	4
Embryology and Histology (Zool. 104, 105).....	3	3
Anatomy of the Fowl (Vet. Med. 11)	2	
Poultry Diseases (Vet. Med. 12)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Ins. 1, 2)	1	1
Approved Electives	3	6
	—	—
	17	17
Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Advanced Poultry Husbandry (P. H. 3, 4)	5	5
Genetics (Zool. 120)	3	
Farm Management (Agron. 505)		3
Approved Electives	6	4
	—	—
	16	16

The following courses are offered:

A. Poultry Husbandry Optional Course. Arranged to meet demands of students unable to take the degree course. Students will be given practice in judging poultry, feeding laying and fattening birds, operating incubators, feeding and rearing chicks, etc., as well as assisting in general work about the department. Practical work supplemented with lectures and recitations in class room.

Vocational course in Agriculture; first semester; 5 credits.

Fee: \$1.00. Dep.: \$1.00. Text: Lippincott: Poultry Production.

B. A continuation of course A, but may be taken separately; second semester; 5 credits.

Fee: \$1.00. Dep.: \$1.00. Text: Lippincott: Poultry Production.

1. Poultry Husbandry. Includes a study of breeds of domestic poultry, their history, and classification. Laying and market qualities of different breeds are emphasized. Breeding fowls for different purposes will be considered, as will the location and construction of the poultry plant and its equipment. Laboratory work consists of practice in judging; preparing poultry products for

market; construction of houses, coops, poultry plant equipment; and drawing plans.

Required of all juniors in Poultry Husbandry; junior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Dep.: \$1.00. Text: Lippincott: Poultry Production.

2. Poultry Husbandry. A continuation of course 1. Includes a study of poultry feeds and feeding with reference to egg and meat production. Reproduction by natural and artificial methods, poultry breeding, markets and marketing. Laboratory work consists of a study of poultry food stuffs and rations. Students will be given practice in preparing different rations. Practice will also be given in hatching and brooding. Each student will have charge of a pen of fowls, and during his period of management will do all the feeding and keeping of records.

Required of all juniors in Poultry Husbandry; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Dep.: \$1.00. Text: Lippincott: Poultry Production.

3. Advanced Poultry Husbandry. For students specializing in poultry husbandry who wish to prepare for future college, experiment Station, or Government work. Current poultry literature, especially reports of experimental work at other institutions, will be studied. Each student will be required to conduct some original investigation work and prepare a thesis. To complete advanced work, each student must give evidence of ability successfully to carry on practical instruction, and investigation work in Poultry Husbandry.

Prerequisites: Poultry Husbandry 1, 2.

Required of all seniors in Poultry Husbandry; senior year; first semester; 5 credits.

4. Advanced Poultry Husbandry. A continuation of course 3.

Prerequisites: Poultry Husbandry 1, 2, 3.

Required of all seniors in Poultry Husbandry; senior year; second semester; 5 credits.

6. Practical Poultry Keeping. A course arranged to meet the demands of students who desire a knowledge of practical poultry keeping, but who are unable to elect a full year's course. The course includes the selection of stock; breeding farm poultry; poultry house construction and equipment; methods of reproducing the flock; poultry breeding; feeds and feeding; as well as markets and preparation of poultry products for market.

Required of sophomores in Agriculture; second semester; 2 credits; 2 lectures or recitations.

Deposit: \$1.00.

8. Poultry Breeding. Study of origin and history of breeds and varieties of poultry. Principles of poultry breeding with special reference to the inheritance of egg production will be emphasized. Lectures supplemented with laboratory work largely in judging birds for constitutional vigor and general utility qualities, as well as a study of type among laying birds.

Elective; first semester; 2 credits; 1 lecture or recitation; 1 laboratory period.

9. Marketing Poultry Products. Study of the different classes of market poultry and eggs and how they may be improved in quality before marketing. Quality of products as affected by feeding, etc., will be considered. Selling and purchasing to best advantage. Study of markets and marketing conditions. Laboratory work will consist of judging, candling, grading, and packing of eggs, finishing, dressing, judging, grading, and packing of poultry for market, and other allied work.

Elective; junior and senior years in Home Economics; first semester; 1 credit; 1 lecture; 1 laboratory period.

***Poultry Diseases.** (Vet. Med. 12.) Elective; required of all seniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 2 laboratory periods; second semester.

***Anatomy of the Fowl.** (Vet. Med. 11.) Elective; required of all juniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 1 laboratory period; first semester.

*The two last courses named above are given as Vet. Med. 11 and 12.

SOILS AND FARM MANAGEMENT

HENRY DESBOROUGH SCUDDER, Professor
CHARLES VLADIS RUSEK, Assistant Professor
JOHN EDWARD COOTER, Instructor

Soils

The soil is the foundation of all agriculture and no student in agriculture is well prepared for his work who is not fully versed in his knowledge of it.

The purpose of the work of the courses in Soils is to give the student a thorough training in this important phase of agriculture, making him competent for his work on the farm or preparing him for positions in state or federal service.

Equipment. A large soil laboratory is equipped with the necessary apparatus for the complete study of the physical properties of soil and problems of soil management. Ample desk room, supplied with running water, gas, compressed air, and electricity, is available. Electric centrifuges and shakers, electric bridge for alkali testing, electric air baths, analytic and torsion balances, microscopes, blast lamps, aspirators, percolators, capillary tubes, mulch cylinders, soil sieves, scales, solution balance, compression filters, soil-sampling tubes, etc., form part of the equipment for the work in Soils. Soil surveying and mapping outfits, soil survey charts of the United States, and a collection of samples of the chief soil types of Oregon and the United States, are available.

A Soil Preparation room equipped with benches, soil-grinding and sifting machinery, and ample space for the drying, preparation, and storage of large quantities of the different soil types used in the laboratories, is available.

An Exhibit Room and Museum has been provided and is being equipped with exhibit cases and racks for the collection of soil and crop specimens and other exhibits of interest and use in the different courses in Agronomy.

A well-stocked reference library is available. The Experiment Station farms at Corvallis and in other parts of the State, together with the cooperative trials in different sections, offer opportunity for field study of soil problems.

COURSE IN SOILS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Forage Crops (Farm Crops 9)	2	
Cereal Crop Lectures (Farm Crops 7)	2	
Agricultural Bacteriology (Bact. 501, 502)	3	3
Land Drainage (Drain. & Irr. 1)		3
Soil Chemistry (Chem. 503)	3	
Soil Physics (Soils 3)		4
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Approved Electives	2	5
	<hr/> 17	<hr/> 17

	Senior Year	Semester	
		1st	2nd
National Government (Com. 320)		3	
State and Municipal Government (Com. 322)			3
Agricultural Geology (Min. 171)		3	
Soil Fertility (Soils 7)		4	
Crop Improvement (Farm Crops 15)			3
Farm Management (Farm Mgt. 1)			3
Soil Surveying (Soils 13)			2
Approved Electives		6	5
		16	16

The following courses are offered:

A. Farm Soils. A brief history of the origin of soils; the fertility of soils; the most valuable chemical constituents; their exhaustion and replenishment; the most important physical factors; their deterioration or improvement. The physical components; their relative value and amounts in soil mixtures. Practice in judging the chief soil types of Oregon. The effects upon soils of tillage, manuring, crop rotation, drainage, and irrigation.

Vocational course, first semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.00. Deposit: \$1.00.

1. Soils. The origin, formation, and classification of soils; a study of the physical properties of soil moisture, heat, and air; the effects of tillage, drainage, and irrigation. The plant foods and soil fertility, fertilizers, crop rotations, and manures. Acid and alkaline soils.

Prerequisites: Chemistry 100 and 101.

Course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Deposit: \$2.00. Text: Lyon, Fippin & Buckman: Soils.

2. Soils. Continuation of the course outlined under "Soils 1."

Course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Deposit: \$2.00. Text: Lyon, Fippin & Buckman: Soils.

3. Soil Physics. Advanced study of the geology of soils, with their origin, formation, physical composition, and classification.

Soil moisture and moisture movements and conservation. The various physical processes of the soil—surface, tension, osmosis, capillarity, diffusion, etc. The effects of the various crops and the different methods of culture upon the texture, aeration, temperature, and moisture of the soil, and the resulting alteration in crop-producing power. The influence of washing, drainage, and irrigation upon soils. Work in the laboratory will consist of the determination and comparison of such physical properties in the various soil types as, specific gravity, water retention, capillarity, organic content, etc.; the physical effect of mulches, rotations, and cropping; soil sampling and judging; the mechanical analysis of soils.

Elective; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Deposit: \$2.00. Text: Mosier & Gustafson: Laboratory Manual.

5. Soil Physics, Elective. Similar to course No. 3, but shorter, dealing with the more important phases of the subject. Designed as an elective for agricultural students unable to take the regular course in Soil Physics, and for students in Irrigation Engineering.

Elective; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.00. Deposit: \$1.00. Text: Mosier & Gustafson: Laboratory Manual.

7. Soil Fertility. Advanced work in the composition and values of fertilizers and barnyard and green manures, and the maintenance and improvement of fertility by the use of the same. The effect of the various crops and different systems of farming upon the fertility of the soil. Crop rotations and fertility in different sections of the state and the United States. The productivity and best use of the different types of Oregon soils, their plant food requirements and comparative values, and methods of improvement of each. Field plot and pot culture investigations. Where necessary, the laboratory work may be omitted and the lecture work only taken (see Soils 9).

Elective; senior year; first semester; 4 credits; 3 recitations; 1 laboratory period.

Fee: \$1.00. Deposit: \$2.00.

9. Soil Fertility Lectures. Same as Soils 7 except no laboratory work.

Elective; senior year; first semester; 3 credits; 3 recitations.

Fee: \$0.50.

11. Dry-Farming Tillage. One of the special courses given in Dry Farming, others of which are described under Field Crops as Semi-Arid Crop Production, and under Farm Management as Semi-Arid Farm Management. This course takes up the advanced study of the subject of moisture conservation, special tillage methods and machinery, soil and climatic conditions, etc., in dry-farming regions, with particular reference to Oregon and the Northwestern states.

Prerequisite: Soils 3 or 5.

Elective; junior or senior year; second semester; 1 credit; 1 recitation.

13. Soil Surveying. For the advanced student who wishes to specialize in Soils for service in the state experiment stations or the Government Bureau of Soils. The course includes some advanced study of the classification of soils and soil areas of the United States, of Oregon, and of the Northwest, but most of the time is devoted to work in the field, making regular and completed soil surveys of assigned areas, with a report thereon.

Prerequisite: Soils 3 or 5.

Elective; senior year; second semester; 2 credits; 2 laboratory periods.

Fee: \$0.50.

15. Advanced Soil Work. The advanced student specializing in Soils may study the various soil types of Oregon through mechanical analysis, and other physical tests; may undertake field work in soil surveying and mapping; or, through wire-basket, pot-culture, and field-plot tests, may determine the effects of various systems of cropping, or fertilizing, or of soil bacteria, upon soil fertility.

Prerequisites: Soils 3 and 7.

Elective; senior or graduate year; either semester; 2 to 5 credits.

Fee: \$1.00. Deposit: \$2.00.

16. Advanced Soil Work. Continuation of course 15.

Elective; senior or graduate year; either semester; 2 to 5 credits.

Fee: \$1.00. Deposit: \$2.00.

Farm Management

No matter how expert the student may become in the various lines of agricultural production, his success as a farmer is not assured unless the organization and management of his farm as a whole, as a profitable business enterprise, is capably done.

The course in Farm Management is designed especially: First, to give the student a broad, well-rounded training in all the phases of agriculture that will prepare him for successful production, but with emphasis laid upon those studies which will fit him best for successful management of the home farm; second, to prepare students for positions as farm managers or for state or federal service in farm management investigational and extension work.

COURSE IN FARM MANAGEMENT

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Forage Crops (Farm Crops 9)	2	
Cereal Crops, Lectures (Farm Crops 7)	2	
Agricultural Economics (Com. 219)	3	
Typewriting (Com. 410a)	1	
Practical Pomology (Hort. 102)	2	
Gen. Farm Mechanics (F. Mech. 1)	2	
Land Drainage or Irrigation Farming (Drain. & Irr. 1 or 3)	3	
Farm Management (Farm Mgt. 1)		3
Soil Physics (Soils 3)		4
Farm Power Machinery (F. Mech. 3)		3
Diseases of Live Stock (Vet. Med. 14)		3
Technical English (Eng. 141)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Summer Field Course—5 credits (See Farm Mgt. 5)		
	17	17

Senior Year	Semester	
	1st	2nd
Soil Fertility, Lectures (Soils 9)	3	
Introductory Entomology (Ento. 301)	2	
Principles of Plant Pathology (Bot. 101)	2	
Diseases of Field Crops (Bot. 105)	1	
Economics Organization of Agriculture (Com. 264)	3	
Accounting and Management of Cooperative Enterprises (Com. 130)	3	
Advanced Farm Management (Farm Mgt. 7)		3
Soil Surveying (Soils 13)		2
Dairy Herd Management (D. H. 40)		3
Feeds and Feeding (A. H. 23)		3
Extempore Speaking (Eng. 104)		2
Approved Electives	2	3
	<hr/> 16	<hr/> 16

The following courses are offered:

A. Practical Farm Management. The chief factors bearing on successful farming, such as the type of farming, size of business, use of capital, handling of labor, proper equipment, cropping systems, marketing, etc., are given consideration from the practical standpoint. The laboratory work deals with the solution of the home-farm problems.

Vocational course; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$0.50.

1. Farm Management. Farm Management deals with the organization and management of the farm as a business enterprise. It concerns itself especially with those factors which affect the labor income. The chief subjects covered in this course are: types of farming, selection and purchase of the farm, requirements as to capital investment and distribution, size and diversity of business, farm rental and leasing methods, management of man and horse labor, farm-equipment costs and duty, cropping systems on different types, maintenance of soil-fertility as a farm management problem, relation of live stock to crop production and to different systems of farming, farm and farmstead layout and building arrangements, production costs, marketing in relation to farm management, the study of successful and unsuccessful farms. When-

ever possible, short field trips are taken. Students desiring to strengthen their work in this course may do so by taking laboratory work to accompany it, registering in Advanced Farm Management (Farm Management 13), 1 credit, for this purpose.

Elective; junior or senior year; second semester; 3 credits; 3 lectures.

Fee: \$1.00.

3. Semi-Arid Farm Management. A study of the farm management problems of the dry farmer and irrigation farmer, and the preparation of management plans dealing with fertility, rotations, equipment, labor distribution, forms of production, marketing, etc., as adapted to semi-arid conditions. When circumstances permit, a field excursion into the dry farming and irrigated sections of Oregon for farm survey work, will be made.

Prerequisite: Farm Management 1.

Elective; senior year; first semester; 1 credit; 1 lecture.

Fee: \$0.50.

5. Farm Management Field Course. A course for students specializing in Farm Management. The object of the course is two-fold: First, to increase the student's knowledge of the practical application of the principles of Farm Management, through direct study and analysis, in the field, of some of the most successful farms in the state; Second, to give the student training in regular farm-management survey work.

In the summer of the junior year, following the close of the College in June, the group of students registered in this course, accompanied by the instructor, spends four or five weeks in the field in various representative sections of the state, devoting about one week to each section. All of the time during the day is spent in the company of the farm owner in the study of his individual farm and its methods, a complete record being taken, and in the evenings this record is analyzed.

In order to reduce expense and increase the efficiency of the work, camp equipment is provided and field camp maintained throughout the period, the student paying only his living and traveling expenses.

Prerequisite: Farm Management 1.

Elective; junior year; 5 credits; field work.

7. Advanced Farm Management. In this course students in Agriculture who have taken or are taking the lecture work in

Farm Management 1 are offered opportunity to do laboratory or field work, applying the principles of the subject in working out problems in which they are especially interested, such as those connected with the home farm or home region or a future farm under certain known conditions.

Students specializing in Farm Management will register in this course for laboratory and field work as indicated above but on a more extensive scale and with wider range, including advanced reading in the literature of the subject.

Elective; junior year, second semester; or senior year, either semester; 1 to 5 credits.

Fee: \$0.50.

9. Seminar. A course for advanced and graduate students only. Discussion of investigational methods, analysis of data, new literature, special problems, etc.

Elective; senior or graduate year; second semester; 1 credit; fortnightly meetings.

11. Accredited Farm Work. The object of this course is to offer opportunity for the furtherance of the student's training in Farm Management through a period of actual experience obtained on a highly developed farm where the practical application of the principles of good management are in successful operation. Advanced or graduate students who have taken the regular four-years course in Farm Management or its equivalent and who have previous good records of practical experience in farming and the necessary personal qualifications as to character, industry, etc., may register in this course. Such students will be assisted to secure places as workmen on "accredited" farms—farms operated by progressive and successful farmers—known to the College as following the best practices in production and management. In addition to gaining actual experience, the student will be required to study the organization, management, methods, costs of production, methods of solution of special problems, etc., on this farm, and make written report upon the same. He will be visited, his work being inspected by the instructor and reported upon by the farm owner. The College credit given the student for a year on such a farm will depend upon the quality of his practical work and the extent and quality of his study of the organization and management as evidenced in his written reports.

Senior or graduate year; 8 to 16 credits.

Fee: \$1.00.

13. Graduate Work. Under this head all graduate work in Farm Management is registered. Graduate work in this field divides itself into the two phases indicated below. Selection should be made according to the work the student desires to prepare himself for.

A. Research. For the student who wishes to prepare himself for investigational and instructional or extension work in Farm Management with the development of Farm Management throughout the country as a distinct science or branch of agriculture, opportunities are opening up for men in either instructional or investigational or extension work in both state and federal service. A wide diversity of problems are available for thesis subjects, ranging from the reorganization and preparation of management plans for unsuccessful farms to the study of efficiency factors in special regions, such as on dry-land or irrigated areas, on marsh or diked lands, on drainage reclamation areas, on distinct soil types, etc. The minor courses required in connection with research problems are taken in residence one or both semesters and the major work in residence or in the field.

Elective; graduate year; either semester; credits to be arranged.

14. Graduate Work. Continuation of course 15 through the second semester's work.

Elective; graduate year; either semester; credits to be arranged.

B. Practical Management. For the student who wishes to prepare himself more thoroughly as a farm manager, one year registered in the course Accredited Farm Work (Farm Management 11) combined with one semester's work in residence graduate work, is suggested.

Elective; graduate year; either semester; credits to be arranged.

VETERINARY MEDICINE

BENNETT THOMAS SIMMS, Professor

The object of the courses in Veterinary Medicine is to prepare the students to recognize disease, treat emergency cases, diagnose and control outbreaks of infectious diseases, and take care of sick animals.

Equipment. This department has its office, laboratory, and lecture room on the second floor of the Dairy building. Laboratory equipment includes mounted skeletons of the horse and cow, complete sets of loose bones, dissected specimens preserved in museum jars, rotary microtome with accessories, microscope, electric oven, electric thermostat, steam and hot air sterilizers, the necessary glassware for physiological laboratory work, and the necessary instruments and drugs for clinical work.

COURSE IN VETERINARY MEDICINE

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
*Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
*Electives	13	13
	—	—
	16	16

The following courses are offered:

A. Diseases of Dairy Cattle. A practical course given to the Dairy Husbandry students who are taking the vocational course. Vocational students; first semester; 2 credits; 2 recitations.

B. Diseases of Dairy Cattle. A continuation of course A. The laboratory work consists of a free clinic. The students observe methods of diagnosis and treatment of both medical and surgical cases.

Vocational students; second semester; 2 credits; 1 lecture; 1 laboratory period.

Fee: \$0.50.

*Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

C. Diseases of Domestic Animals. A practical course given to Animal Husbandry students who are taking the vocational course. The laboratory work consists of a free clinic, which provides an abundance of animals for treatment.

Vocational students; second-semester; 2 credits; 1 lecture; 1 laboratory period.

Fee: \$0.50. Text: P. B. Hadley: The Horse in Health and Disease.

1. Comparative Anatomy. Anatomy is taught in the most practical manner possible. Special attention is paid to the digestive systems of the horse and cow; to the foot, the muscles of locomotion, and the teeth of the horse. The laboratory work includes complete dissection of the digestive, urinary, genital, and respiratory systems, and partial dissection of the circulatory, muscular, and nervous systems.

Prerequisites: Zoology 108, 109. Chemistry 500, 501.

Junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

2. Comparative Physiology. The study of the functions of the body. Special attention is paid to the digestive system. The physiological processes of all the domestic animals are studied, with special emphasis on the horse and cow. The laboratory work consists of practical experiments which are correlated with the lectures.

Prerequisite: Veterinary Medicine 1.

Junior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

Fee: \$1.00.

3. Diseases of Live Stock. The parasitic, infectious, and non-infectious diseases of domestic animals are considered in this course. Special attention is given to the prevention and control of parasitic and infectious diseases. The laboratory work consists of a free clinic, which provides an abundance of both medical and surgical work. The students assist in handling and diagnosing the medical cases, and in operating on the surgical cases. They also observe the results of treatment of all animals in the hospital.

Prerequisites: Veterinary Medicine 1 and 2.

Senior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

Fee: \$0.50.

4. Diseases of Live Stock. A continuation of course 3.

Senior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

Fee: \$0.50.

5. Veterinary Histology. The histology of the domestic animals.

Elective; junior or senior year; first semester; credits to be arranged.

6. Veterinary Histology. A continuation of course 5.

Elective; junior or senior year; second semester; credits to be arranged.

Fee: \$1.00.

11. Anatomy of the Fowl. A study of the structure of the body of the fowl. The laboratory work consists principally of dissection.

Fee: \$0.50.

12. Poultry Diseases. The parasitic, infectious, and non-infectious diseases are considered. Special emphasis is placed upon methods of prevention and control of parasitic and infectious diseases. Students observe autopsies, methods of diagnosis, and treatment of fowls.

Junior or senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

14. Diseases of Live Stock. A one-semester course for Agronomy students. The more common diseases, with the methods of prevention and control, are considered. The laboratory work consists of a free clinic, which provides an abundance of animals for both surgical and medical treatment.

Prerequisites: Zoology 108, 109. Chemistry 500, 501.

Junior or senior year; second semester; 3 credits; 2 lectures; 1 laboratory period.

Fee: \$0.50. Text: R. A. Craig: Common Diseases of Farm Animals.

ZOOLOGY

GEORGE FRANCIS SYKES, Professor
ALICE LEORA EDWARDS, Instructor
IRVINE HILL BLAKE, Instructor
ASA CHANDLER, Instructor
HOWARD MARSHALL WIGHT, Instructor

The interests of human life are so intimately bound up in the facts of animal life that today, at least, a general knowledge of

the science of Zoology is considered a personal asset few students can afford to omit from their college course. The instruction in this department, therefore, is designed not only to awaken interest in the study of native birds, insects, and other animals in order to afford a basic knowledge of the structure and functions of the animal body, but particularly to develop the faculty for determining the dynamic value of an animal, or a group of animals, in the solution of the problems of everyday life.

By means of lectures, laboratory work, and field observations, the student becomes familiar with the form and habits of various representatives of the animal kingdom, learning something of the mechanism of living things, of their importance as active forces in nature, and of the biological laws according to which their development is regulated. The work is adapted, so far as possible, to the particular needs of students in Agriculture, Forestry, Pharmacy, and Home Economics.

Opportunity is offered, moreover, to those who desire it, to receive training for teaching zoology, physiology, or nature study in the public schools; for development of the game and food resources of the State; or for the pursuance of studies in the field of research. In connection with the course in Pharmacy, the required work forms a valuable pre-medical course.

Equipment. The laboratories of the department occupy the following rooms on the third floor of Agricultural Hall; offices, physiological laboratory, laboratory for embryology and histology, general laboratory for zoology, lecture room, vault and photographic dark room. The general laboratory is equipped with desks with individual drawers to accommodate 280 students; each desk is provided with compound microscopes, dissecting microscopes, and various minor pieces of apparatus. The physiological laboratory is similarly equipped for 225 students and in addition is provided with an articulated skeleton, a dissectible human skull, a complete Azoux model of the human body, greatly enlarged Azoux models of the brain, eye, ear, and other organs, a set of the celebrated Leukart zoological charts, and a good supply of specimens and dissections for illustrating the work in physiology. The laboratories are provided with high-grade compound and dissecting microscopes, a Minot rotating microtome, paraffin bath, eye piece and stage micrometers, and an abundant supply of minor instruments.

The museum contains, in addition to a beautiful collection of native birds, a small collection of mounted mammals, the Ladd collection of bird skins, a large collection of eggs of native birds, a small collection of fishes and reptiles, a considerable number of marine invertebrates, including a small but beautiful collection of Philippine shells, and numerous specimens of a miscellaneous nature.

COURSE IN ZOOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 77-79.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219)	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
*Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
*Electives	13	13
	—	—
	16	16

The following courses are offered:

101. General Zoology. A general introduction to advanced courses in the department; designed also for students who, without intending to pursue the subject further, desire a general view of zoological work and its problems; lectures and laboratory work supplemented by collateral reading and field investigation, gives general knowledge of different animal forms; distribution; habits; mechanism and functions of body; introduction to laboratory methods of dissection and experiment; outline of biological theories of selection, adaptation, and evolution. Runs throughout the year.

The courses in Pharmacy, Physical Education, and for Pre-medical students; freshman year; first semester, 3 credits; 2 lectures; 1 laboratory period of three hours.

Fee: \$1.50. Deposit: \$1.00.

*Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

102. General Zoology. A continuation of 101.

Prerequisite: Zoology 101.

The courses in Pharmacy, Physical Education, and Pre-medical students; freshman year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

Fee: \$1.50. Deposit: \$1.00.

103. Functional Zoology. A brief course designed to give students in Home Economics some conception of the structure and physiological activities of animals, as a basis for the work in Physiology. The work consists of a general survey of the forms and activities of living organisms, with general reference to the human organism.

The course in Home Economics; freshman year; first or second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. (Not given 1916-17.)

Fee: \$1.50. Deposit: \$1.00.

104. Embryology and Histology. The origin and development of the animal body; the elementary structure of the adult organs and tissues; a study of the chick and pig with reference to other animals and man; practice in micro-technique, killing, fixing, imbedding, sectioning; adapted to the requirements of the general student as well as to those intending to study Veterinary medicine.

Prerequisites: Zoology 101, 102; or 108, 109; or the equivalent.

For students in Agriculture, Pharmacy, Physical Education, and other courses; junior or senior year; first semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each.

Fee: \$2.00. Deposit: \$3.00.

105. Embryology and Histology. A continuation of course 104.

Prerequisite: 104.

For students in Agriculture, Pharmacy, Physical Education, and other courses; junior or senior year; second semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each.

Fee: \$2.00. Deposit: \$3.00.

106. Game Propagation. A laboratory and reading course, supplemented by field work in the propagation of food animals of the field and forest; the breeding and protection of game birds and mammals; methods of conducting game reservations; and a comparative study of game laws.

Elective for students in Agriculture and Forestry; first semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged. Offered in 1916.

Fee: \$0.25.

107. Ornithology. A lecture course and field study of the common birds of Oregon; the course aims to develop an interest in the native birds, their habits, and haunts, with particular reference to their usefulness.

Elective; second semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged.

Fee: \$0.25.

108. Principles of Economic Zoology. Designed for both students in Agriculture and in Forestry; the facts and conditions that render animal life an important factor in the economic problems of life; prefaced by a study of animal forms, distribution, and habits. The physiological functions of the body. Lectures, laboratory work, and collateral reading.

Required of Agricultural and Forestry sophomores; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

Fee: \$1.50. Deposit: \$1.00.

109. Principles of Economic Zoology. Continuation of course 108. A dynamic interpretation of life; contact in the field with vital economic problems, agricultural or sylvan. An outline of the different biological theories, natural-selection, adaptation, cultivation; acquaintance with their fundamental principles leading to an insight into the more far-reaching significance of everyday problems.

Prerequisite: 108.

Required of Agricultural and Forestry sophomores; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

Fee: \$1.50. Deposit: \$1.00.

110. Animal Parasites. An advanced course for the study of such parasitic forms as flukes, tapeworms, nematodes, fish "lice," cattle ticks, etc., that affect the health of man, and of domestic and food animals; the study will be primarily ecological, the object being to obtain a more exact knowledge of the conditions which produce parasitism, to the end that by intelligent control, diseases and economic losses may be rendered less liable, and preventive measures made productive of more permanent results.

Prerequisites: Zoology 101, 102; or 108, 109; and 104, 105, or the equivalent.

Elective to students in Agriculture, Forestry and Pharmacy, Vet. Bacteriology; junior or senior year; first semester; 2 credits; hours to be arranged.

Fee: \$1.00. Deposit: \$1.00.

111. Protozoology. An advanced course for the study of microscopic animals with a view to their relation, beneficially or injuriously, to man, particular attention being paid to such pathogenic forms as blood spores and enteric parasites, with some reference to soil protozoans and water animalcules.

Prerequisites: Zoology 101, 102; or 108, 109; and 201, 202, or the equivalent.

Elective for students in Agriculture, Pharmacy, Aquiculture, and Bacteriology; second semester; 2 credits; hours to be arranged.

Fee: \$1.00. Deposit: \$1.00.

112. Research and Thesis. Opportunity will be given students who desire to specialize in Zoology and Physiology to take up work not given in the regular courses, or to undertake the investigation of special problems. Work for the master's degree, either as a major or as a minor in this department, may be selected. It is the policy of the department to allow the student to develop his own initiative in the selection of a problem, and in outlining and conducting his investigations, but with the cooperation of the head, or other member, of the department.

Elective for seniors and graduates; first semester; credits to be arranged.

113. Research and Thesis. A continuation of course 112.

Elective for seniors and graduates; credits to be arranged.

Deposit: \$3.00.

114. Aquiculture. Lecture, laboratory, and field course dealing with the problems and methods of sea-farming and fish culture; the hatching and rearing of fish and other aquatic food animals, the planting and care of oyster and clam beds, and a study of the various methods of production and preparation for market.

Elective for Agriculture and Forestry students; first semester; 3 credits; hours to be arranged.

Fee: \$1.50. Deposit: \$1.00.

115. Aquiculture. A continuation of 114.

Elective for Agricultural and Forestry students; second semester; 3 credits; hours to be arranged.

Fee: \$1.50. Deposit: \$1.00.

116. Taxidermy and Zoological Collecting. Lecture, laboratory, and field course in the methods involved in the preparation of skins, the preservation of museum specimens, and a study and practice of the methods involved in field survey work.

Elective for Agriculture and Forestry students; second semester; credits to be determined; hours to be arranged.

Fee: \$1.50. Deposit: \$1.00.

120. Genetics. A lecture course dealing with the general principles of heredity, and the factors involved in variation and inheritance; the fundamental principles of breeding. The course will be prefaced by lectures on the phenomena of reproduction; and will be followed by an explanation of the mechanism of heredity, involving a discussion of problems of inheritance of acquired characters, segregation, dominance, and sex determination, with respect to their application both to the human and to the domestic forms. Experimental problems may be outlined for practical investigation for those who may desire to carry on such work.

Elective for juniors in Agriculture and others; first semester; 3 credits; 3 lectures; 1 laboratory period of 1 hour.

Fee: \$0.25.

201. Physiology and Anatomy. Intended not only for the general student, but also for students particularly interested in this branch of Zoology, and for those who expect to study medicine; a study of the structure, significance, and function of the human body, with reference to the animal body in general; the laboratory course includes some work upon the gross anatomy and the histology of the various tissues and organs of a typical mammal; also includes experiments and demonstrations with foods, the study of blood, nerve, muscle, reactions, etc.

Prerequisites: Zoology 101, 102, or the equivalent.

Physical Education freshmen, Pharmacy sophomores; elective for other students; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

Fee: \$1.50. Deposit: \$1.00.

202. Physiology and Anatomy. A continuation of course 201.

Prerequisites: Zoology 101, 102, 201.

Pharmacy sophomores; elective for other students; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

204. Physiology and Hygiene. A general course designed primarily to give Commerce students a practical knowledge of the functions and care of the human body in every-day life. The laboratory will be of such nature as to furnish demonstrations of the physiological principles.

Elective to Commerce in conjunction with Bacteriology 101; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

Fee: \$1.50. Deposit: \$1.00.

205. Nutritional Physiology. An advanced course dealing particularly with the process of digestion, absorption, nutrition, secretion and excretion.

Prerequisites: 207, 208; or the equivalent.

Elective for students in Home Economics; senior year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

Deposit: \$3.00.

207. General Physiology. The object of this course is to give to the Home Economics student the knowledge of life processes and anatomical relationships which will be most useful in maintaining the highest efficiency of the human mechanism; the chief functions of the human body and the laws of health falling naturally within the province of the physiologist, including such experimental, histological, and anatomical work as will best serve the object of the course.

Home Economics; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

Fee: \$1.50. Deposit: \$1.00.

208. General Physiology. A continuation of 207.

Home Economics; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

Fee: \$1.50. Deposit: \$1.00.

209. Neuro-Physiology. An advanced course dealing with the special processes and anatomical relationships of the nervous system; an examination of the physiological bases of mental states; experimentation in neuro-muscular reactions; studies in animal behavior.

Prerequisites: 100, 102, 201, 202, or the equivalent.

Elective; Pharmacy and other students; first semester; 2 credits; 1 lecture; 1 laboratory period of three hours.

Deposit: \$3.00.

211. Elementary Physiology. For the women of the Home-makers' course; an elementary study of the process and organs of digestion, circulation, excretion, reproduction, etc. The physiological basis of the laws of hygiene.

Required of women in the Home-makers' course; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

Fee: \$1.50. Deposit: \$1.00.

THE SCHOOL OF COMMERCE

JOHN ANDREW BEXELL, Dean

The School of Commerce offers two distinct courses of study; namely, (1) a four-years course leading to the degree of Bachelor of Science in Commerce; (2) a two-years vocational course leading to a Certificate of Business Proficiency. The practical side of every subject is especially emphasized, the constant aim being to train the student for service and efficiency.

The Vocational Course. This course has been arranged primarily for the benefit of persons who have been unable to finish a high-school course. The only entrance requirements are that the applicant must have had an eighth-grade education, or its equivalent, and must be at least eighteen years of age. The student may emphasize bookkeeping and business methods, or stenography and typewriting; or he may have an opportunity to take both courses.

The Degree Course. In the degree course all freshmen follow the same schedule; in the sophomore year, however, the student may choose as a major either accounting or secretarial studies, the latter including stenography and office practice. In the junior year, the student may further select a major course from one of the following: (1) Business Administration, (2) Economics, (3) Political Science and History, (4) Secretarial Studies. Instead of the above options, a liberal range of general electives is offered, so that in the junior or senior year the men may elect courses in Agriculture, Forestry, or Industrial Arts, while the women may elect courses in Home Economics.

Departments. For administrative purposes, the School of Commerce is organized into four distinct departments: (1) Business Administration, (2) Economics, (3) Political Science, and (4) Stenography and Office Training.

REQUIREMENTS FOR GRADUATION IN SCHOOL OF COMMERCE

For graduation in the school of Commerce a total of 136 college credits must be completed. It is expected that the suggested schedule as listed elsewhere for this school will be closely followed. Before graduation a student must complete credits as indicated in the following groups:

General group at least 22 credits.

Natural Science group at least 6 credits.

Commerce group at least 66 credits.

Mathematics group at least 3 credits.

Gymnasium 2 credits.

Military Science 2 credits.

Military Drill 6 credits.

Free Electives 29 credits.

VOCATIONAL COURSE IN COMMERCE

	Semester	
	1st	2nd
First Year.		
Vocational English (Eng. G, H)	3	3
U. S. History (Hist. D)	3	
Civics (Com. N)		3
Stenography (Com. 400, 401) or	4	4
Office Training and Typewriting (Com. 410, 411, S) ..	(2)	(2)
Penmanship (Com. U, V)	(2)	(2)
Commercial Arithmetic (Math. M. N)	3	3
Bookkeeping (Com. B. C)	3	3
Gymnasium (Phys. Ed. 11, 12)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military A, B)	1	1
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Second Year.		
Advanced Vocational English (Eng. I, J) or.....	3	3
Stenography (Com. 402, 403)	(4)	(4)
Business English (Eng. M, N)	3	3
Accounting (Com. 100, 101)	3	4
Elementary Commercial Geography (Com. H)	2	
Elementary Industrial History (Com. K)		2
Commercial Law (Com. L)	3	
Elementary Industrial Problems (Com. J)		3
Penmanship (Com. W. X)	1	1
Gymnasium (Phys. Ed. 13, 14)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military C, D)	1	1
	<hr/>	<hr/>
	16 $\frac{1}{2}$	17 $\frac{1}{2}$

	Semester	
	1st	2nd
First Year, Second Semester Registration.		
Vocational English (Eng. H)		3
Bookkeeping (Com. B)		3
History of Commerce (Com. 205)		3
Civics (Com. N)		3
Penmanship (Com. V)		2
Typewriting (Com. 411) or		(4)
Stenography (Com. 400)		(4)
Gymnasium (Phys. Ed. 12)		$\frac{1}{2}$
Drill (Military B)		1
		<hr/> 17 $\frac{1}{2}$

DEGREE COURSE IN COMMERCE

Freshman Year.

Accounting (Com. 100, 101)	3	4
Stenography (Com. 400, 401)*	4	4
Business English (Eng. 143) or Modern Language.....	3	
Technical Business English (Eng. 144).....		3
Commercial Geography (Com. 200)	3	
History of Commerce (Com. 205)		3
Advanced Commercial Arithmetic (Math. 10)	3	
Contemporary American History (Hist. 62)		3
Library Practice (Lib. 1)	$\frac{1}{2}$	
Hygiene (Ph. Ed. 10)	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4)	1	1
	<hr/> 18 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$

Sophomore Year.

Modern English Prose (Eng. 81, 82) or French, German or Spanish	3	3
Economic History of The United States (Com. 206).....	3	
Principles of Economics (Com. 210)		3
Advanced Commercial Law (Com. 300, 301)	3	3
Accounting (Com. 102, 103) or Stenography (Com. 402, 403)	4	4
Modern European History (Hist. 40)		3
History of Oregon (Hist. 70)	3	
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4)	1	1
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

*Or Science, See requirements for Graduation.

	Semester	
	1st	2nd
Junior Year.*		
Money and Banking (Com. 230)	3	
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Business Organization and Management (Com. 110).....	3	
Advertising and Selling (Com. 112)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Practical Sociology (Com. 250)		3
Free Electives (6-3) (See groups)	6	6
	<hr/> 17	<hr/> 17

Senior Year*		
Public Finance (Com. 233)	3	
Transportation (Com. 240)		3
Comparative Study of Governments (Com. 325)		3
International Relations (Com. 302)	3	
Free Electives (10-10) (See groups)	10	10
	<hr/> 16	<hr/> 16

Freshman Year, Second Semester Registration.

Accounting (Com. 100)	3
Modern English Prose (Eng. 82)	3
Advanced Business English (Eng. 143)	3
Principles of Economics (Com. 210)	3
History of Commerce (Com. 205)	3
Typewriting (Com. 411) or	2
Stenography (Com. 400)	(4)
Gymnasium (Phys. Ed. 16)	1½
Drill (Military 4)	1
	<hr/> 18½

Note: Six credits in sciences are required for graduation. The following are recommended: Chemistry 100, 101, Physics 1, 2, Bact. 101, Zoology 204, or Botany 20.

*On recommendation of the professor in charge of the major course, the junior and senior schedules may be modified to suit the individual student, provided, that the entire course shall contain not less than 66 nor more than 75 credits in professional subjects, and not less than 39, nor more than 61 credits in non-professional subjects.

SUGGESTED ELECTIVE GROUPS

While the student may choose other subjects than those enumerated below, he is strongly urged to adopt one of the suggested groups.

Group 1. Business Administration. Semester
Junior Year. 1st 2nd

Commercial Pharmacy (Phar. 160)	3	
Labor Problems (Com. 213)		3
Practical Public Speaking (Eng. 105, 106)	3	3
	—	—
	6	6

Senior Year.

Accountancy Problems (Com. 105)	3	
Public Accounting and Auditing (Com. 106)		3
General Psychology (Ind. Ed. 101)	3	
History of Education (Ind. Ed. 120)		3
Economic Organization of Agriculture (Com. 264).....	3	
Insurance (Com. 235)		3
Business Lecture and Reading Course (Com. 140, 141)....	1	1
	—	—
	10	10

Group 2. Economics and Sociology.

Junior Year.

American Literature (Eng. 71, 72) or	3	3
Modern Language		
Cooperation (Com. 260)		3
Science	3	
	—	—
	6	6

Senior Year.

Accountancy Problems (Com. 105)	3	
Public Accounting and Auditing (Com. 106)		3
Insurance (Com. 235)		3
Practical Public Speaking (Eng. 105)	3	
General Psychology (Ind. Educ. 101)	3	
History of Education (Ind. Educ. 120)		3
Lecture and Reading Course (Com. 140, 141).....	1	1
	—	—
	10	10

Group 3. Political Science.**Semester****Junior Year.****1st 2nd**

History of English Literature (Eng. 61, 62) 3 3

Economic Organization of Agriculture (Com. 264)..... 3

Insurance (Com. 235) 3

6 6**Senior Year.**

Advanced American Government (Com. 304) 3

Practical Legislation (Com. 328) 3

History of the British Empire (Hist. 52) 3

American Diplomatic History (Hist. 80) 3

Accountancy Problems (Com. 105) 3

Public Accounting and Auditing (Com. 106)..... 3

Lecture and Reading Course (Com. 140, 141)..... 1 1

10 10**Group 4. Teachers' Course.****Junior Year.**

General Psychology (Ind. Ed. 101) 3

Educational Psychology (Ind. Ed. 102) 2

Principles of Education (Ind. Ed. 131) 3

History of Education (Ind. Ed. 120) 3

Lecture and Reading Course (Com. 141)..... 1

6 6**Senior Year.**

Special Methods (Ind. Ed. 180, 181) 2 2

Business Organization and Management (Com. 110)..... 3

Labor Problems (Com. 213) 3

Approved Electives 5 5

10 10

Group 5. Agriculture. Semester**Junior Year.****1st****2nd**

Soils (Agron. 101)	3	
Crops (Agron. 201)		3
Approved Electives	3	3
	—	—
	6	6

Senior Year.

Stock Judging (An. Hus. 1)	2	
Live Stock Management (An. Hus. 2)		3
Plant Propagation (Hort. 105)		2
Orchard and Garden Practice (Hort. 103)	2	
Approved Electives	6	5
	—	—
	10	10

Group 6. Home Economics.**Junior Year.**

Food Preparation (D. S. 101)	3	
Food Preparation (D. S. 102)		3
Approved Electives	3	3
	—	—
	6	6

Senior Year.

Dressmaking (D. A. 201)	3	
Dressmaking (D. A. 202)		3
Approved Electives	7	7
	—	—
	10	10

Note.—If the student has not already six college credits in Science he should register according to Note concerning requirement for graduation page 178, in the Junior or Senior year.

COURSE IN FARM BUSINESS AND RURAL LEADERSHIP.

	Semester	
	1st	2nd
Junior Year.		
Economic History of the U. S. (Com. 206)	3	
Rural Finance (Com. 265)		3
National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Genetics (Zool. 120)	3	
Practical Sociology (Com. 250)		3
Cooperative Accounting and Management (Com. 130)....	3	
Dairy Herd Management (D. H. 40)		3
Soil Fertility (Agron. 107)	3	
Feeds and Feeding (A. H. 23)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	—	—
	17	17
Senior Year.		
Public Finance (Com. 233)	3	
Comparative Governments (Com. 325)		3
Economic Organization of Agriculture (Com. 264)	3	
Rural Sociology (Com. 252)		3
Literature and Exposition of the Rural Life (Com. 255)..	3	
Farm Management (Agron. 505)		3
Forage Crops (Agron. 203)	2	
Elementary Laboratory Bacteriology (Bact. 102).....		2
Practical Pomology (Hort. 102)	2	
Approved Electives	3	5
	—	—
	16	16

BUSINESS ADMINISTRATION

JOHN ANDREW BEXELL, Professor
 JOHN B. HORNER, Professor of History
 ERWIN BERTRAM LEMON, Instructor
 RUSSEL MARION HOWARD, Instructor

The distinctive work of the department of Business Administration in the School of Commerce is to train men and women for efficient business management. This includes thorough courses in

the various phases of Accounting, Auditing, Business Organization, Scientific Management, Advertising, and Salesmanship.

While the courses in Business Administration are primarily designed to fit students for the countinghouse and business office, including banking, it is found that such positions are generally only stepping stones to more advanced positions of trust and responsibility. A large percentage of the commercial students eventually engage in business of their own.

The School of Commerce has taken a leading part in developing courses in business methods especially adapted to the farm, the home, and cooperative enterprises. Such courses are given not only in residence but also by correspondence.

When it is remembered that every vocation has its business side, and that this phase of all pursuits is receiving increasing attention, it is apparent that the avenues of employment and the chances for promotion by the really competent business expert are almost unlimited. As a preparation for law or public accounting, this course, combined with economics and political science, is especially attractive. A large proportion of the graduates in commerce find employment as teachers of commercial subjects in state and private schools; to them the courses in business administration are very important.

Equipment. The Department of Business Administration occupies the top floor of the east wing of Agricultural Hall. It is completely equipped for thorough and efficient work in modern business courses. Each room is specially designed and furnished for the work to be conducted in it. The furniture of the department consists of individual desks and counters, a complete set of modern banking fixtures, a wholesale house, a retail house, a commission house, freight, real estate, and insurance offices. Permanent blank books, letter files, rubber stamps, copying presses, college currency, blanks and similar material are provided by the College. A Burroughs Adding Machine is in constant use in the department. The room for typewriting contains twenty standard machines, each provided with approved conveniences for the operator. The room for stenography is furnished with tables designed for conveniences in practical work, as well as in equipment for illustrating various systems of filing.

COURSES IN BUSINESS ADMINISTRATION

For outline of courses in Business Administration consult pages 177-179.

The following courses are offered:

B. Bookkeeping. The aim of this course is to give the student a thorough foundation in the fundamental principles of bookkeeping. The theory of debit and credit, modern books of original entry, closing a set of books, statements, promissory notes, interest and discount, drafts, bills of lading, and other legal forms receive much attention. The subjects of partnership, shipments, and consignments are also introduced. Every phase of the work is illustrated by means of a large number of practical problems secured from various sources.

Vocational Course; first year; either semester; 1 recitation; 4 Laboratory periods.

Fee: \$1.00. Text: MacFarland & Rossheim: A first year in Bookkeeping and Accounting.

Prerequisite: Course B.

C. Bookkeeping. Continuation of Course B. Elementary problems of how to handle depreciation, reserves, and accruals; the preparation, analyzing, and checking of balance sheets and financial statements; the distinction between capital and revenue; the use of controlling accounts and columnar books is carefully treated. Throughout the entire course, the work is supplemented by a large number of practical problems illustrating the various subjects treated.

Vocational Course; first year; second semester; 3 credits; 1 recitation; 4 laboratory periods.

Fee, \$100; text: same as course B.

D. Dairy Accounting. The same general course as E, except that in the last third of the course special attention will be given to the development of a system of accounts suited to the dairy business.

Dairy Vocational Course; second semester; 3 credits; 2 recitations; 1 laboratory period.

Texts: Bexell & Nichols: Principles of Bookkeeping and Farm Accounts. I. C. S.: Cost Accounting. Robinson: Organizing a Business.

E. Farm Accounting and Business Methods. (a) **Bookkeeping:** Students who are not acquainted with the elements of double-entry

bookkeeping will be required to work out several practice sets and master the theory of accounts before taking up farm accounting.

(b) **Business Methods:** A thorough course in the essentials of business methods required on a well-managed farm. Financial accounts and statements, cost accounts and special records, business methods, business organization, business correspondence and forms; household and personal accounts.

This course may also be taken by correspondence.

Agriculture; Vocational Course; second semester; 3 credits; 4 recitations.

Texts: Bexell & Nichols: Principles of Bookkeeping and Farm Accounts. Robinson: Organizing a Business.

F. Shop Accounting. A course in the theory and practice of accounting especially adapted to the shop and factory. Sufficient time is devoted to the fundamental principles of bookkeeping to familiarize the student with the use of special columns and various labor-saving devices. A special set of books adapted to the shop is then studied and prepared, making the course exceptionally practical. Besides the course in the technique of bookkeeping, considerable time is devoted to the phases of business management, such as advertising, selling and buying.

Mechanic Arts; third year; second semester; 2 credits; 2 recitations.

Text:

U. Penmanship. Students entering the first year are expected to have acquired a good hand in the grades, but considerable time is devoted during the first year to mastering the best form of business writing and lettering.

Vocational Course; first year; either semester; 2 credits; 2 recitations.

V. Penmanship. A continuation of Course U.

Vocational Course; first year; second semester; 2 credits; 2 recitations.

W. Advanced Penmanship. Special emphasis is laid on rapid business writing, correct forms of business papers, lettering, and designing.

Vocational Course; second year; first semester; 1 credit; 1 recitation.

X. Advanced Penmanship. A continuation of Course W.

Second semester; 1 credit; 1 recitation.

100. **Principles of Accounting.** Modern accounting as practiced in the best business establishments of the country, forms the basis of the course. The use of special columns, controlling accounts, and their adaptations, is carefully studied. Labor saving devices of all kinds are studied with a constant view to secure greater accuracy and to diminish work. A great deal of practice in retail, wholesale, and commission accounting, and the preparation and interpretation of financial statements is required. In connection with partnership accounts, a careful study is made of opening closing entries; adjustment of profits and losses; consolidation of firms; changing from partnership to single proprietorship and vice versa. The practical side of every phase of the course is emphasized by various sets of books which the student prepares under the supervision of the instructor.

Prerequisite: Course C or equivalent.

Commerce; *Freshman year; Vocational Course, second year; either semester; 3 credits; 1 recitation; 4 laboratory periods.

Fee: \$1.00; Text: Miner: Complete Bookkeeping.

101. **Practical Accounting.** (a) **Corporation Accounts:** A presentation of the theory of manufacturing bookkeeping and the preparation of a set of books illustrating corporation bookkeeping as applied to manufacturing business. (b) **Principles of Cost Accounting:** A careful study of the element of cost entering into the finished product, the various methods of finding cost and its proper distribution. (c) **Short Accounting Systems:** A further study of the use of special column books and filing devices, with reference to the saving of time and labor in bookkeeping, as applied to modern business houses. The practical work also consists of the preparation of sets of books illustrating the principles involved.

Commerce; Freshman year; Vocational Course; second year; either semester; 4 credits; 1 recitation; 5 laboratory periods.

Prerequisite Course 100 or equivalent.

Fee: \$1.00. Text: A large number of practical problems and exercises selected from various sources.

102. **Accounting and Business Practice.** (a) **Bank Accounting.** A thorough course in modern bank accounting and business

*Freshmen who have not had Course C or equivalent, desiring to enter this course, may do so by registering for Course 107 and carrying both courses simultaneously.

practice. The organization of private, state, and national banks, trust companies, and other financial institutions. (b) **Business Practice.** The business practice course is designed to supplement all the theoretical courses and to develop initiative and originality. The offices are thoroughly equipped with modern labor-saving appliances, such as filing devices, loose-leaf books, adding machines, duplicating devices, etc.

Prerequisite: Course 101.

Commerce; sophomore year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Texts: Miner: Banking Set. Klein: Elements of Accounting.

103. **Accounting and Business Practice.** This course covers the broader economic phases of accounting. Emphasis is laid on accounts as a means of administrative control and economy of production. (a) **Factory Costs:** A system of accounts and records especially adapted to a manufacturing business with a considerable pay-roll. (b) **Farm Costs Accounts:** A system of cost accounts adapted to the farm or any productive enterprise. (c) **Business Practice:** A continuation of Course 102.

Prerequisite: Course 102.

Commerce; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Text: Heitman: Higher Accounting; Guide to the Study of Auditing. Cole: Accounts: Their Construction and Interpretation.

105. **Accounting Problems.** In the efficient administration of a business of some magnitude, the accounting department is of first importance. In it, difficult problems arise, which require not only accounting skill, but judgment and executive ability. This course covers a large variety of practical problems viewed from the standpoint of the manager rather than the accountant. The material is drawn from certified public accountancy examinations and other sources. The student does not follow any prescribed form of treatment or solution, but is expected to develop analytical initiative, resourcefulness, and originality.

Prerequisite: Course 103.

Elective; senior year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

Text: Greendlinger: Accounting Problems; select C. P. A. Problems.

106. Public Accounting and Auditing. (a) Public Accounting.

This course embraces a study of accountancy as a vocation; the C. P. A. laws of the various states are studied and compared; an analysis and interpretation of accounts and financial statements; terminology and procedure in public systems form an important part of this course. (b) **Auditing:** The duties and responsibilities of the auditor; his function in the executive staff; his relation to the accounting department; different classes of audits; investigation in the conduct of utility corporations, municipalities, and public institutions. Typical audits will be studied and compared.

Prerequisite: Course 105.

Elective; senior year; second semester; 3 credits; 3 recitations; 1 laboratory period.

Text: Montgomery: Auditing in Principle and Practice.

107. Bookkeeping. A thorough but rapid study of the general principles of bookkeeping. The aid of this course is twofold; first, to prepare the student for the study of an advanced set of books adapted to his particular vocation; second, to afford those students entering the Degree Course in Commerce who have not had a year of bookkeeping an opportunity to secure additional instruction which will enable them to carry Course 100. In the latter case, the student should register for both Course 107 and Course 100.

Commerce and Elective; freshman year; first semester; 3 credits; 5 recitations.

Fee: \$1.00. **Text:** Miner: Complete Bookkeeping.

108. Special Accounting. In this course the student is given an opportunity to apply the principles of accounting to his special needs, the course being designed primarily for engineering students. Cost accounting, and corporation accounts and statements receive special attention.

Prerequisite: Course 107 or equivalent.

Electrical Engineering Course (elective to others); freshman year; second semester; 1 recitation; 2 laboratory periods.

109. Farm Accounting and Business Methods. (a) Farm Accounting. This part of the course consists of a thorough discussion of a system of accounts suited to the farm. Cost accounting is especially emphasized, with a view to determining the results of different enterprises. A knowledge of the principles of bookkeeping is required before entering upon cost accounting. Students who are not thus prepared will be required to devote extra

time to make up the deficiency. (b) **Business Methods:** The economics of business receive special attention in this part of the course. The farmer is becoming a factor in commerce and finance to be reckoned with. He often engages in business adventures outside of farming; if he aspires to success, he must observe the same rules of business as a manufacturer, merchant, or banker. Business organization, principles of business management; labor efficiency; buying and selling; advertising and correct office methods receive special attention.

Agriculture; sophomore year; first semester; 2 credits; 2 recitations.

Texts: Bexell & Nichols: Principles of Bookkeeping and Farm Accounts. Robinson: Organizing a Business.

110. **Business Organization and Management.** (a) **Business Organization:** General nature of business organization; evolution and forms; structure and life-history of typical corporations; the corporation and trust problem; public utility corporations; reorganization and receivership; blue sky laws and state control. (b) **Parliamentary Practice:** A brief discussion of parliamentary practice and procedure as applied to corporate business. (c) **Business Management:** This part of the course emphasizes internal organization for the purpose of securing efficiency; departmental organization and coordination; various systems of scientific management are studied and compared.

Commerce; junior year; first semester; 3 credits; 3 recitations.

Text: Haney: Business Organization. Gowin: The Executive and His Control of Men.

111. **Thesis.** A research course and treatise on the organization and management of a business in which the student is especially interested. The subject of the thesis must be chosen at the time of registration, and a complete outline approved by the professor in charge not later than November 1. When the thesis is approved, a bound (either printed or typewritten) copy must be deposited in the College library.

Prerequisite: All College courses in Business Administration.

Open only to seniors; both semesters; 1 credit each semester.

112. **Purchasing and Selling.** (a) **Purchasing:** principles of purchasing; relations of buying to successful merchandising and

manufacturing; ethics of buying; the purchasing organization; records of purchasing; stores, their function and operation; markets; agents; brokers; jobbers; wholesalers; transportation; reports and statistics. (b) **Advertising:** A study of the fundamental principles of modern advertising. Special emphasis is given to the peculiarities of composition in newspaper and circular advertising, proofreading, effectiveness of design, illustration and display, follow-up systems, etc. (c) **General Principles of Salesmanship:** Business ethics; wholesaling and retailing; brokerage and commission; specialty selling; the sale of service; planning a selling campaign; special sales; prices; correct buying.

Commerce; junior year; second semester; 3 credits; 3 recitations.

Texts: Twyford: Purchasing. Neystrom: Retail Selling.

120. **Household Accounts.** A course dealing with the business side of the household. The family income and its distribution; the planning of the annual budget; a simple but complete system of household accounts based on the budget; private accounts as a basis for encouraging thrift among members of the family; bank accounts and their relation to household finance; savings and how they grow.

Home Economics; sophomore year; first semester; 1 credit; 1 recitation.

122. **Business Management for Women.** The aim of this course is to treat in a practical way the ordinary rules and methods of conducting business affairs. Two distinct phases are emphasized as follows: (a) **Finance:** Value of money, how savings grow, banking and credit, general principles of investment, loan associations, bonds, stocks, and insurance. (b) **Fundamentals of Business Law:** The principles of the law of contracts, of negotiable paper, mortgages, real property, and wills.

Home Economics; elective to juniors and seniors; second semester; 2 recitations.

Text: Cromwell: American Business Woman.

(Will not be given in 1916-17.)

124. **Pharmacy Accounting.** A course in the theory and practice of accounting, especially adapted to the drug business. Sufficient time is devoted to the fundamental principles of bookkeeping to familiarize the student with the use of special columns and various labor-saving devices. A special set of books adapted

to the average drug establishment is then prepared, making the course exceptionally practical. Besides the course in the technique of bookkeeping, considerable time is devoted to other phases of business management, such as advertising, selling, and buying.

Pharmacy; elective; second semester; 2 credits; 2 recitations.

130. Accounting and Management of Cooperative Enterprises.

This course covers the business management of cooperative societies. It includes such subjects as the organization of the employees; structure of buildings; office arrangement and equipment; correspondence and filing; bookkeeping and cost accounting especially adapted to different types of cooperative associations in the United States, such as creamery associations, cow-testing associations; auditing, banking, and finance; purchasing, advertising, selling; depreciation of assets; conduct of membership meetings; annual reports and audits; statistical analysis of operations. The course is based on the system published by the Co-operative Union Ltd. of England, adapted to American conditions.

Farm Management; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Text: Wood: The Cooperative Secretary. U. S. Bureau of Markets Bulletins.

140. Business Men's Lectures and Reading. (a) Lectures.

A series of lectures on practical business subjects will be given during the year by prominent business men of the State. Following is a tentative list of subjects during the present year: Present Problems in Finance; Organization of a Bank; Organization of a Railroad; Organization of a Department Store; Advertising and Selling; Buying Merchandise; The Fishing Industry of Oregon; The Lumber Industry of Oregon; The Business Side of Farming; Commercial Expansion of the United States; Duties and Responsibilities of the Bank Cashier; Education for Business; Business Opportunities in Oregon. Various topics in Business Law and Insurance will be discussed by specialists. (b) Reading. An assignment of reading will be made at the beginning of the semester covering such phases of the lectures as are best suited to the needs of individual students.

This course is open to all students of the College. To obtain credit complete notes must be submitted on the lectures and assigned readings, and an examination taken on the course. One

lecture a week. First semester, one credit. Assistant Professor Maxey in charge.

141. Business Men's Lectures and Reading. A continuation of course 140. Second semester, one credit. One lecture a week. Assistant Professor Maxey in charge.

150. Forestry Accounting. (a) A brief, intensive study of the fundamental principles of double-entry accounting. The theory of debit and credit, labor-saving features, controlling accounts and their adaptations. The purpose of this course is to give the student the necessary foundation for the second part of the course, which deals with the lumber industry.

(b) This part of the course will consider especially those systems of accounts, forms, and records, which are adapted to the lumber industries. Cost accounting and statements receive especial attention. It is not intended to make of the student a professional accountant, but rather to teach him accounting as a means of control and the proper methods of analyzing the different operations connected with the business.

Logging Engineering; freshman year; elective second semester; three credits; 2 recitations; one laboratory period.

ECONOMICS AND SOCIOLOGY

HECTOR MACPHERSON, Professor
ELMER JAY BROWN, Associate Professor
NEWELL ROWLAND COMISH, Instructor
RUSSELL MARION HOWARD, Instructor
GUILFORD LANSING HURD, Instructor

The work of this department of the School of Commerce serves a three-fold purpose:

(1) **The training of men and women for citizenship.** Every citizen has business relations requiring a knowledge of the fundamental principles of political economy. Then, too, the necessity of such knowledge is especially felt in a democracy where every man and woman has the right to vote, and is called upon to mold legislation directly. The basis for intelligently exercising this paramount duty of citizenship can only be supplied by a training in economics and sociology, the problems of which form the subject matter of all legislation.

(2) **To provide courses supplementary to the various branches of applied science.** To the agricultural college belongs the special

task of developing the field of Agricultural Economics and Rural Sociology. It is the aim of this department to provide the necessary training for teachers in these subjects, to prepare specialists for research work in economic and social surveys of rural communities, and to equip those who will make a life work of organizing farmers' associations for the more economical conduct of the business side of farming.

(3) Field Work. The Bureau of Organization and Markets. At its meeting October 9, 1914, the Board of Regents established the Bureau of Organization and Markets for the purpose of assisting farmers in the marketing of their products.

The work of the bureau is, in the first place, investigational. It aims to find out the conditions fundamental to successful marketing, and to place the results of its investigation at the disposal of all who are interested.

In the second place, it is at the service of any group of farmers contemplating the establishment of any sort of business organization. It has worked out model constitutions and by-laws and standardized systems of accounting; it has lists of equipment and can guide the farmers to where such equipment can be most cheaply obtained. It will also assist organizations in planning the kind of plants necessary to carry on their business.

Equipment. The department has for some years been developing a commercial museum for use in the various courses in economic and social science. The museum has now grown to such an extent that it is a very important factor in making the work of the department practical and successful. The Bureau of Organization and Markets also has a collection of bulletins, pamphlets, lantern slides, and documents illustrating the farmers' marketing and organization movement in all parts of the world.

GRADUATE COURSES IN AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

Courses will be outlined leading to the degree of Master of Science in Agricultural Economics and Rural Sociology. It is strongly recommended that students wishing to pursue this work, take the Agricultural course during their first two years in College, and that they follow the work outlined in the course in Farm Business and Rural Leadership on page 182, during their junior and senior years.

Students taking the regular Commercial course, who contemplate studying for a Master's degree in Agricultural Economics and Rural Sociology, should commence with their sophomore year to take certain courses in Agriculture which will be chosen in consultation with the deans of the schools of Agriculture and Commerce.

Our aim is to make the graduate work in this course fit students for County Agriculturists, positions in the U. S. Department of Agriculture, especially in the office of Markets and Rural Organization, teachers in rural High Schools, and for Rural Leadership in general. Students will also be prepared for Civil Service examinations in this general field.

For outline of courses in Economics and Sociology in the School of Commerce consult pages 177 - 179.

The following courses are offered:

ECONOMICS

H. Elementary Commercial Geography. Especially adapted for Vocational students. A general survey will be made of the fundamental conditions affecting industrial and commercial development. This will be followed by a study of the natural resources, industries, products, and commerce of the United States, and each of the principal countries of the world. Emphasis will be laid upon the reasons for the organization of industry. Materials from the Commercial Museum will be used in connection with the course.

Vocational Mechanic Arts, second year; vocational Commerce, second year; first semester; 2 credits; 2 recitations.

I. Business and Social Organizations. A discussion of the principles of better business and better living that should accompany the general improvement in farm methods, which it is the purpose of this school to promote. The general application of the economic laws of consumption, distribution, and production to the business side of farming, and the social and economic results of agricultural organization will be studied by the aid of textbook, lectures, and assigned readings.

Vocational Agriculture; first semester; 3 credits; 3 recitations.

J. Elementary Industrial Problems. Especially designed for Vocational students in Industrial Arts and Commerce. It aims to give them some insight into the economic problems with which they have to deal. A very condensed outline of the principal economic concepts will be followed by the discussion of industrial organization, labor problems, transportation, marketing, taxation, etc.

Vocational Mechanic Arts, third year; vocational Commerce, second year; first semester; 3 credits; 3 recitations.

K. Elementary Industrial History. A general but comprehensive review of the most important phases of the economic development of the United States. It will include a historical study of such topics as tariff, internal improvements, slavery, banking, industrial development, commerce and shipping, immigration and other similar topics, together with a study of present-day problems, as outlined in the press.

Vocational Mechanic Arts, second year; vocational Commerce, second year; first semester; 2 credits; 2 recitations.

200. Commercial Geography. The fundamental conditions underlying all industry and all commerce are taken up in detail. First of all basic elements as climate and topography are investigated, as they mold transportation and commerce and the production of animal and vegetable products. Then the natural resources of the different countries of the world are treated with especial emphasis upon those of the United States.

Specimens from the Commercial Museum will be used by the students in making reports on the production and manufacture of the principal raw materials and their relation to the development of the countries from which they come. The course presupposes a fair knowledge of physical and political geography and of general history.

Freshman Commerce, freshman Industrial Engineers, sophomore Mechanical Engineers; first semester; 3 credits; 3 recitations.
Text: Smith: Industrial and Commercial Geography.

205. History of Commerce and Industry. The development of commerce from the time of the Phoenicians. The commercial achievements of some of the early nations. The industrial development of Great Britain, as a basis for the study of the United States, in course 206, including the rise and breaking down of

feudalism, important changes in agriculture, Gill system, rise of the factory system, and its results, the market system, and England's present industrial position.

Freshman year; second semester; 3 credits; 3 recitations.

Texts: DeGibbins: Industry in England. Bland, Brown & Tawney: Select Documents in English Economic History.

206. Economic History of the United States. This course follows and develops out of the previous work in Commercial Geography and the History of Commerce. On the basis of a knowledge of our natural resources and of the previous commercial and economic development of the world, we attempt to outline and interpret the economic progress along many lines which has been made by the United States. The development of agriculture, the growth of manufacturing, the improvement of transportation, the history of labor organization and legislation, the evolution of our monetary and credit systems, changes in the protective tariff, etc., are traced from Colonial times onward.

Prerequisites: Commerce 200, 205.

Sophomore year; first semester; 3 credits; 3 recitations.

Text: Bogart: Economic History of United States. Callender: Economic History of United States.

210. Principles of Economics. A general course covering the elementary problems of our industrial and commercial organization, including the nature of wealth, its production and consumption, and the different forms in which it is found; the conditions underlying its success in agriculture and manufacturing; the localization of industry and the relation of raw material to manufacturing; the law of diminishing returns; division of labor and efficiency in production; exchange and distribution and their dependence upon the price-making process, the factors determining prices, wages, interest, and rent; the problems of taxation; public expenditures; protection and free trade; money and banking; labor problems and transportation.

Textbook, lectures, and reports on assigned readings.

Prerequisites: 200 and 206.

Forestry, junior year; first semester; Commerce and Engineers, sophomore year; second semester; 3 credits; 3 recitations.

Text: Ely: Outline of Economics. Brown: Questionnaire and Syllabus.

211. Principles of Economics. A course especially adapted for students in Home Economics. Not open to Commerce students.

Home Economics; junior year; first semester; 2 credits; 3 recitations.

Texts: Ely: Outline of Economics. Brown: Questionnaire and Syllabus.

213. Labor Problems. Begins with a brief historical review of the rise of a labor class. The influence of occupation upon the laborer; and the different types of labor and the problems involved in the occupations represented by the several technical departments of the College, will be studied. Then follows the beginnings of organization; the structure, aims, methods of offence and defence, and achievements of associations of labor. The trade agreement, the strike, the boycott, the lockout, methods of conciliation and arbitration, the application of the injunction in labor disputes, the political activity of labor organizations, employers' liability, legislation, workmen's insurance, profit sharing and cooperation in relation to labor problems, will be taken up with the aid of a textbook, lecture, and assigned readings. Studies will be made of typical historical and current labor disputes and embodied in term papers and class discussion.

Prerequisite: Commerce 210.

Commerce and Forestry; junior year; second semester; 3 credits; 3 recitations.

Text: Hobson: Work and Wealth. Carleton: History and Problems of Organized Labor.

219. Agricultural Economics. The fundamental principles of production, distribution, and consumption are taken up with especial reference to agriculture. The aim of the course is to acquaint the student with the laws of supply and demand and the influences determining them. A brief history of agricultural production is taken up, showing the growing complexity of the economic problems of taxation, transportation, marketing, etc., as the transition is made from self-sufficing, general farming to localized, commercial agriculture.

Agriculture; junior year; first semester; 3 credits; 2 recitations and one lecture (of sections combined).

230. Money and Banking. (a) **Money:** The nature and functions of money, legal tender, Gresham's law, coinage; the factors affecting prices, and their relation to business conditions; a brief

history of the various forms of paper currency; silver legislation; present problems and conditions.

(b) **Banking:** Procedure in organizing state and national banks; history of banking, including our National Banking System as modified by the Federal Reserve Bank Act of 1913; the functions of banks; the preparation and analysis of bank statements; loans and the granting of credit, securities required; rediscount; duties of the various bank officers; legal principles of banking; the principles underlying foreign exchange; a comparison of our banking system with that of foreign countries.

Prerequisite: Commerce 210.

Commerce; junior year; first semester; 3 credits; 3 recitations.

Text: Holdsworth: Money and Banking.

233. Public Finance. An examination will be made of public expenditures, local, state, and national. For this purpose, typical financial budgets and reports will be analyzed. A history of reforms calculated to secure efficiency in these expenditures will be sketched. The various forms of taxes, customs, and fees whereby revenues are raised, will be taken up in detail and their apportionment studied in relation to the budgets previously analyzed. Present systems of land taxation will be studied in the light of proposed reforms. An attempt will be made to give the student some laboratory practice through the study of local systems of assessment and the resulting apportionment of taxes.

Commerce; senior year; first semester; 3 credits; 3 recitations.

Texts: Plehn: Introduction to Public Finance. Bullock: Selected Readings in Public Finance.

235. Insurance. A course designed to cover, in a general way, the whole field of insurance. The nature and statistical basis of different kinds of insurance will be first treated. Then the application of the principles discovered to different forms of insurance, such as straight life, endowment, accident, industrial, old age, fire, live stock, hail, etc., will be taken up in detail.

Elective; junior and senior years; second semester; 3 credits; 3 recitations.

240. Transportation. The relation of transportation systems to industrial and commercial progress; a brief historical review of the development of systems of transportation; the organization and financing of different systems; the effects of competition in the

railroad business; freight classification, and the making of rates and fares; the necessity of government control, and attempts at regulation by state and federal governments; government ownership in the light of European experience.

Senior year; second semester; 3 credits; 3 recitations.

Texts: Ripley: Railroads; Rates and Regulations. Johnson & Huebner: Railroads; Rates and Traffic.

250. Practical Sociology. In this course, social theory will be subordinated to the study of practical social problems. The different social and political units, such as the family, school, church, club, city, state, and nation will be discussed in their relation to the general welfare. This will necessitate an examination of the organization, purpose, and methods of each of these functional groups, involving a discussion of the training of children, employment of women and children, marriage and divorce; the labor movement as a factor in the struggle for existence; overcrowding in city slums, and its amelioration; the causes of pauperism, immorality, and crime, with modern methods of their treatment, etc. A good general textbook will be studied and the whole field covered in class discussion and assigned readings.

Junior year; second semester; 3 credits; 3 recitations.

Texts: Hayes: Introduction to the Study of Sociology. Carver: Sociology and Social Progress.

251. Practical Sociology. Course 250 especially adapted for students in Home Economics. Not open to students of Commerce. Textbook and lectures.

Home Economics; junior year; second semester; 2 credits; 3 recitations.

Text: Hayes: Introduction to the Study of Sociology. The Survey.

252. Rural Sociology. This course will deal with the special problems of the rural family, the rural school, the rural church, rural societies and associations, and the relation of the State to the general rural welfare. This will involve an inquiry into the prevailing ideals of the rural community regarding labor and leisure; art, literature, and music; and the necessity for recreation. Recent progress in adapting education to rural needs will be discussed. City over-crowding will be examined from the rural point of view, and the lessons which the rural community can learn from the progress made by cities in solving their problems, will

be emphasized. The social and educational effects of the telephone, free mail delivery, rural press, and improved methods of agricultural production and exchange, will be discussed in detail. The best textbooks in the field will be carefully studied, and the whole ground covered in class discussion and assigned readings.

Elective; junior and senior year; second semester; 3 credits; 3 recitations.

254. National Vitality. A one-credit course, covering the general field of national vitality, its importance, the conditions underlying it and the means of maintaining such conditions. The economic and social waste due to disease, alcohol, and vice will be treated in a series of lectures by experts from different departments of the College. Outside specialists will also be secured to lecture upon particular phases of the subject. Besides taking notes on the lectures, each student will be required to make an abstract of not less than three hundred pages of assigned readings.

Elective for all students; first semester; 1 credit; 1 recitation.

Note: This course will not be given unless at least fifteen students register for it.

255. The Literature and Exposition of Rural Life. A critical study will be made of the general field of literature bearing upon rural life. Typical interpretations of rural life will be taken from the best poetry and prose. The rural press will be studied with a view to estimating its sociological and economic influence. Themes will be prepared upon current economic and sociological topics and the subject matter discussed in the class room to familiarize the student with the problems involved in the Rural Life movement.

Elective; junior and senior year; first semester; 3 credits; 3 recitations.

260. Cooperation. This course takes up the origin and development of the cooperative movement in Europe, and its introduction into the United States. It sets forth the general principles underlying the economic and social activities of cooperative associations. Then, following this, the different types of organization, the methods by which they are formed, their working plans in different enterprises, and the factors which determine their success or failure, will be studied in detail. The store, the factory, the dairy and cow-testing association, the credit organization, etc., will be taken up systematically, and the advantages and difficulties of cooperation will in each case receive careful analysis.

Elective to juniors and seniors who cannot take Commerce 264 and 265, and who have had considerable training in Economics. First semester; 3 credits; 3 recitations.

264. The Economic Organization of Agriculture. This course, together with 265, is designed to give a more specialized training in the economic problems of agriculture than is possible in the general course outlined under 219.

In both courses, 264 and 265, economic problems are discussed from the standpoint of the efficiency to be attained through closer organization. Existing associations of farmers both in this country and in Europe will be carefully studied by means of sample constitutions and by-laws, and also by lantern-slide illustrations of the work actually being accomplished through cooperation in Europe and America. The aim is to turn out men trained to play their part in the revolution in agricultural business methods which is now sweeping over this country.

(a) **Economic Problems of Production and Marketing:** Old methods and their weakness are examined, and the possible savings through organized business are investigated.

(b) **The Purchase of Farm Supplies:** The purchasing end of the farm business is about as important as the selling of farm products. Present methods will be taken up in detail, and the possibility of eliminating waste and duplication thoroughly discussed and illustrated.

(c) **The Problems of Transportation as Affecting the Farmer:** The economic significance of the good roads movement will be dealt with; systems of rail and water transportation will be taken up, government control discussed, and the possibility of eliminating waste through precautions on the part of the shippers pointed out.

Open to all who have had 219 or its equivalent; elective for juniors and seniors; first semester; 3 credits; 3 recitations.

265. Rural Finance. (a) **Rural Credit.** The principles of money, credit, and banking will be sufficiently studied to lay the foundation for the examination of the credit needs of the rural communities, and the most economical means of satisfying them. The reasons why farmers have been so poorly served by existing credit institutions will be investigated. The credit institutions of Europe will be compared with those of the United States; the development of cooperative credit in European countries will be

carefully studied, and the present widespread movement to adapt cooperative credit institutions to American rural conditions will be closely followed.

(b) **Rural Insurance.** The basis of insurance of different kinds will be taken up, and applied to agricultural needs; old line, mutual, and fraternal organizations will be examined from the standpoints of efficiency and safety.

(c) **Rural Taxation.** The general principles of public finance will be taken up in so far as may be necessary to lay the foundation for an intelligent discussion of rural taxation; existing systems, as well as proposed reforms, will be examined.

Open to all who have had 219 or its equivalent; elective; junior and senior year; second semester; 3 credits; 3 recitations.

270. Problem Course. Students especially interested in Applied Economics may select some problem within the scope of the work characteristic of the College, and under the direction of the instructor in charge prepare a thesis embodying the results of an investigation made during the senior year.

Elective; senior year; both semesters; 1 credit (each semester); consultation by appointment.

280. The Economics of Distribution. A seminar covering the whole subject of the distribution of wealth, preparatory to graduate and thesis work in Agricultural Economics and Rural Sociology.

Open to graduate students who have had 219, 264, and 265 or an equivalent training.

281. Continuation of Course 280. This course is required in order to receive credit for first semester's work.

Open to graduates who have had 219, 264, and 265 or equivalent training; both semesters; 3 credits; 3 recitations.

(Note: This course will be given as a seminar by special arrangement.

283. Markets and Marketing. The development of marketing systems; the study of local, state, and national commercial programs and policies; commercial clubs, boards of trade, chambers of commerce, speculation organized and unorganized; foreign trade relations, the consular service, commercial treaties, tariffs, bounties, and foreign exchange.

Open to graduate students who have had Com. 280. First semester; 3 credits; credit not given for one semester's work.

284. Continuation of Course 283. This course is required in order to receive credit for first semester's work.

Open to graduate students who have had Commerce 280, or equivalent work; both semesters; 3 credits; 3 recitations.

Note: This course will not be given in 1916-17 unless demand warrants it.

POLITICAL SCIENCE

ULYSSES GRANT DUBACH, Professor
CHESTER COLLINS MAXEY, Assistant Professor
RUSSELL MARION HOWARD, Instructor

The work of this department of the School of Commerce includes two divisions: business law, and government. In the business law courses, arranged to accommodate students of different preparation and needs, the department endeavors to train the students for practical business affairs, particularly to give the legal information necessary to prevent the common business errors. Special attention is given to industrial and rural problems.

In order to acquaint the student with the rudiments of court procedure, a practical case is tried by the class, the students performing all the parts.

In the courses in political science proper, the department seeks to instruct in the basic general principles of all government, the construction and operation of modern governments, with particular attention to that of the United States, the rules and principles which regulate the relations of governments with each other. The courses are planned with the purpose of equipping students for an intelligent participation in governmental affairs. The work culminates in the courses of Advanced American Government and Practical Legislation, designed to instruct in the fundamentals of law making. The work implies that as citizens, our students will take a dynamic part in the various activities of government, including law making.

For outline of courses in Political Science in the School of Commerce consult pages 177-180.

The following courses are offered:

L. Commercial Law. Adapted to students of limited training. A course covering the general principles of contracts, and particular contracts including sales of goods, bailment, insurance, credits, loans, negotiable instruments, agency, partnership, corporations, and property.

Vocational course; second year; and Mechanical Arts; third year; first semester; 3 credits; 3 recitations.

Text: Huffcut: Elements of Business Law.

N. Civil Government and Administration. (a) **Civil Government:** Our European ancestors; origin of states and state institutions. English and American governments compared; federal and state constitutions; state and foreign service; the executive departments; federal and state power; political parties and issues.

(b) **Federal and State Administration:** A survey of the administrative activities of federal, state, and municipal governments; governments from the sociological point of view. The financial operations, preparation of budgets and reports, will be considered.

Vocational course; first year; second semester; 3 credits; 3 recitations.

Text: Ashley: American Federal State.

300. Advanced Commercial Law. (a) **Contracts in General:** Formation of contracts, offer, acceptance, form, and consideration; competence of parties, consent, and legality of subject matter; operation of contracts, including limit of obligations and assignments; interpretation, rules of evidence, and construction; discharge of contracts; the agreement, performance, breach of contract, etc.

(b) **Negotiable Instruments:** Maker's, acceptor's, drawer's and indorser's contracts; proceedings before, upon, and after dishonor; proceedings in protesting; accommodation paper; grantor and surety; holder's position, defense, equities, agency, insurance, etc.

Sophomore year; first semester; 3 credits; 3 recitations.

Text: Spencer: Manual of Commercial Law. Bay: Cases on Commercial Law.

301. Advanced Commercial Law. (c) **Partnership Law:** Formation of partnerships, essentials, liabilities of members, capital, profits, good will, individual and firm property; agency for partners; dissolution winding up; priority of distribution, etc.

(d) **Corporation Law:** Kinds, formation, powers, liabilities, ownership, shares, subscription, calls, notice, transfers, management, officers, directors, contractional powers, dividends, dissolution, are discussed fully from the legal point of view.

(e) **Property:** Classes, method of acquiring and transferring titles, mortgages, lease, landlord and tenant, etc. The case method

is used throughout the entire course. Lectures, reports, and discussions.

Sophomore year; second semester; 3 credits; 3 recitations.

Text: Spencer: Manual of Commercial Law. Bay: Cases on Commercial Law.

Note: Credit will not be given for Com. 300 without Com. 301 except on special permission of the department.

302. International Relations. Persons concerned, rights and duties of states; territorial jurisdiction; jurisdiction on the high seas; agents of the state treaties; settlements of disputes; war and its effects; military occupation; neutrality, contraband, blockades, etc. Lectures, reports, and discussions.

Senior year; first semester; 3 credits; 3 recitations.

Text: Hershey: Essentials of Public International Law.

304. Advanced American Government. This course will supplement courses 320 and 322 giving chief attention to the interpretation of our federal and state constitutions, and the relation of legislation to these constitutions. Court reports will be used liberally with a view to showing the interpretation of the rights of the people guaranteed in our constitutions and of the powers granted to the government by these instruments. Course 320 is prerequisite.

Elective; junior or senior year; first semester; 3 credits; 3 recitations.

Text: Hall's Constitutional Law is used as a basis for the course. Case briefing is required as a large part of the work.

306. Commercial Law. A short course in the laws of business. Recitations and discussions.

Pharmacy and Farm Management students.

Second semester; 3 credits; 3 recitations.

Text: Huffcut: Elements of Business Law.

307. Rural Law. A special course supplementary to Commercial Law 300 and 301, elaborating on such questions as fixtures, fences and inclosures, roads, easements, location of land, titles, abstracts, mortgages, legal status of crops in case of termination of lease or sale of land, insurance, irrigation, drainage, and water rights in general.

Elective; junior or senior year; 1 credit; 1 recitation.

320. National Government. (a) **National Government:** The Constitution; rise of the American Union; distribution and powers

of the Government; powers of Congress; powers of the executive; the judicial departments; checks and balances of governments; governments of territories and colonies; admission of new states; amendments to the Constitution; civil rights and their guarantees; protection of persons accused of crimes; protection of contracts and property, etc. Lectures, readings, reports, and discussions.

(b) **American Politics:** Origin of political parties in the United States; changes, growth, and development; party platforms.

Junior or senior year; first semester; 3 credits; 3 recitations.

Text: Beard: American Government and Politics. Young: New American Government.

322. State and Municipal Government. A study of the functions of state government; the machinery of state government; political parties in state government; special study of the government of the State of Oregon; municipal government, including county, town, and city government.

Lectures, readings, reports, and discussions.

Junior or senior year; second semester; 3 credits; 3 recitations.

Text: Beard: American Government and Politics. Young: New American Government.

325. Comparative Governments. A critical study of the governments of the principal countries of the world, with special emphasis on modern movements and features of government, that are problems in the United States at present.

Lectures, reports, and discussions.

Senior year; second semester; 3 credits; 3 recitations.

Text: Ogg: European Governments.

326. Practical Legislation. The work in Advanced American Government would serve as a preparation for this course which will instruct in practical bill drafting. Attention will be given to the correct form, and the correct expression of the desired content of bills. Emphasis will be placed on the necessity of preparing laws with reference to prior legislation and court decisions. In addition, an attempt will be made to show the necessity of studying conditions, and the possibility of guiding legislation to meet the demands of the times. Special emphasis will be placed on rural and industrial legislation. Course 304 is prerequisite.

Elective; junior or senior year; second semester; 3 credits; 3 recitations.

Text: Jones: Statute Law Making in the United States.

STENOGRAPHY AND OFFICE TRAINING

_____, Assistant Professor
BERT WALTER HARRIS, Assistant Professor.*
ETHA MABEL MAGINNIS, Instructor

The courses offered by this department of the School of Commerce are for four classes of students: (a) those desiring a thorough training as stenographers and typists; (b) those desiring to go still further into the field of court reporting and secretarial training; (c) those desiring to enter the teaching profession; and (d) those commercial teachers desiring advanced training.

The ground covered by the special subjects offered by this department is as follows: Stenography and Typewriting, two years; Court Reporting, one year; Secretarial Training, one year; and Method of Teaching Commerce, one year.

Equipment. The Office Training department is well equipped with the latest office appliances and fixtures, including the standard types of typewriters, duplicators, mimeographs, dictaphones, and filing cabinets.

Each student is given access to equipment upon payment of a fee required for the course in which he is registered. All equipment and apparatus is kept in constant repair, and students are taught, under the direction of the instructors, how to keep the apparatus they use in proper repair and efficiency.

400. Elementary Stenography and Typewriting. (a) **Gregg Shorthand:** Theory manual covered thoroughly. Shorthand penmanship given special attention. Dictating machines used in preparation of assignments for class work. Primary, Intermediate, and Complete certificates granted.

Texts: Gregg: Shorthand Manual. Gregg: Writer.

(b) **Rational Typewriting.**† The theory and practice of touch typewriting, covering mastery of the alphabet, numerals, mechanical arrangement of business correspondence and legal forms, tabulating, and speed practice. Special attention is given to the mechanics of the typewriter.

* On leave of absence.

† By special permission of instructor, 400 (b), Typewriting, may be omitted, with a reduction of one credit. This applies particularly to students of schools other than Commerce.

Commerce students starting Stenography, having had previous training in typewriting, will not be excused from 400 (b); budgets of an advanced character will be assigned them. Credit will not be given for first semester's work in stenography, unless the course is carried the full year.

Degree course, sophomore year, and Vocational course, first year; either semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each.

Fee: \$2.00. Text: Rational Typewriting.

401. Elementary Stenography and Typewriting. A continuation of course 400. Speed practice finished through the principal series and phrase letters. Elementary office equipment studied and used. Typewriting Speed Certificates granted.

Degree course, sophomore year; and Vocational course, first year; either semester; 4 credits; 4 recitations; 4 laboratory periods.

Fee: \$2.00. Text: Gregg Shorthand Manual, Rational Typewriting.

402. Advanced Stenography and Typewriting. Dictation covering vocabularies of representative business, such as real estate, law and collections, banking and financial, life and fraternal insurance, publishing, railway, manufacturing, civil service. The typewriting periods will be taken up with transcription of dictation. 80-, 100-, and 120-word speed certificates granted.

Course 412 must be taken concurrently with this course by Commerce students.

Degree course, junior year; and Vocational course, second year; first semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each.

403. Advanced Stenography and Typewriting. A continuation of course 402. Court and lecture reporting introduced. Course 413 must be taken concurrently with this course by Commerce students.

Degree course, junior year; and Vocational course, second year; second semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each.

Fee: 2.00. Text: Eldridge: Dictation Exercises. Gregg Writer.

404. Reporters' Course. Designed for those having finished course 403 and desiring to specialize in court or convention reporting.

Elective; senior year; first semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each.

Fee: \$1.00. Text: Expert Shorthand Speed Course.

405. Reporters' Course. A continuation of course 404.

Elective; senior year; second semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each.

Fee: \$1.00. Text: The Gregg Reporter.

410. Typewriting and Office Training. Designed especially for students not enrolled in Stenography, but who desire a knowledge of Typewriting and Office Appliances. (a) **Typewriting:** Covering the same ground as course 400-b. Not open to stenography students.

(b) **General Office Methods:** Office records and systems, relation between employer and employee; office equipment and its efficient arrangement. Especial attention will be given to training students in office methods that apply to their particular branch of work.

Elective, all courses; either semester; 2 credits; 4 laboratory periods.

411. Typewriting and Office Training. Continuation of 410. Not open to Stenography students.

Elective, all courses; either semester; 2 credits; 4 laboratory periods.

Fee: \$2.00. Text: Rational Typewriting.

412. Office Training for Stenographers. Designed to give such knowledge and training as is called by employers, "experience." This course is so arranged that it is an integral part of course 402, Advanced Stenography and Typewriting. Topics covered: Attractive arrangement of business letters; applying for a position; office routine; inclosures, remittances, and banking; filing systems; office appliances; shipping information; business ethics and bibliography; legal papers and transactions; telegraph and telephone; printing and proofreading; a day's work coordinated into an organized whole.

Junior year; first semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each. Required of all taking course 402.

Fee: \$1.00. Text: Office Training For Stenographers.

413. Secretarial Training for Stenographers. Continuation of course 412. Actual service in the College administrative offices required. Office efficiency problems studied.

Junior year; second semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each. Required of all taking course 403.

414. Bibliography. Advanced library training for secretaries and others, in order that they may know where and how to find quickly all information regarding any important field of knowledge. Method of indexing books and general filing. Twelve lectures and problems will be given by experts in the various fields, covering the main principles, chief authorities, and the sources of material.

Dewey Decimal Classification: 3 lectures and problems by the College Librarian. Subject Headings: three lectures and problems by the College Cataloguer.

Elective; junior year; second semester; 1 credit; 1 lecture.

416. Expert Typists' Course. Designed to give expert finger training, word and sentence drills, mastery of the key-board, drills for speed and endurance, errorless typewriting. Certificates of Proficiency and Awards for speed and accuracy will be issued.

Prerequisite: One-year's work in typewriting.

Either semester; 1 credit; one 3-hour laboratory period.

Fee: \$1.00. Text: Expert Typewriting.

417. Expert Typists' Course. A continuation of course 416. Special emphasis will be laid on Tabulating, Billing, Manifolded, and Mimeographing. Artistic typewriting, based upon the following points: even touch, absolute accuracy, and judicious display, will be a strong feature of the course.

Prerequisite: Commerce 416.

Elective; either semester; 1 credit; one 3-hour laboratory period.

Fee: \$1.00. Text: Expert Typewriting.

SCHOOL OF ENGINEERING AND MECHANIC ARTS

GRANT ADELBERT COVELL, Dean.

Four-years courses leading to the degree of Bachelor of Science are offered in the School of Engineering as follows:

- A course in Civil Engineering.*
- A course in Electrical Engineering.
- A course in Highway Engineering.
- A course in Industrial Arts.
- A course in Irrigation Engineering.
- A course in Mechanical Engineering.

A three-years vocational course in Mechanic Arts is also offered. While this course does not lead to a degree, a certificate or diploma will be awarded to those students who complete it.

CIVIL AND HIGHWAY ENGINEERING

GORDON VERNON SKELTON, Professor
REX EARLE EDGEComb, Assistant Professor
SAMUEL MICHAEL PATRICK DOLAN, Instructor
DEXTER RALPH SMITH, Instructor

COURSE IN CIVIL ENGINEERING*

The purpose of the course in Civil Engineering is to give the student thorough theoretical instruction, accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, and Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department. The student has the opportunity, during the senior year, to select his work along lines that he is most interested in.

Recognizing the value of drawing to the professional engineer, not only as a means of expressing his ideas and of carrying out his plans, but also as a means by which the young graduate may enter some of the most desirable positions, the department lays special emphasis upon this subject. Much drawing is also required in connection with the preparation of plans and working drawings, as part of the office work of the higher technical courses.

The work in Surveying begins with the freshman year and continues through the sophomore year, with from six to nine hours of field practice a week. The student serves in subordinate positions at first, and gradually advances as a knowledge of the instru-

*No work below senior grade will be given in Civil Engineering during the year 1916-17.

ments is acquired. After having served his term as an apprentice, he is placed in charge of field parties and is held responsible for the results accomplished. During the freshman year he is given practice in land surveying and leveling, and during the sophomore year in topographic and railroad surveying. At all times, conscientious attention to duty, accuracy, and speed will be demanded. Every student keeps full and accurate notes of all work done in the field. These, after being criticised, are transcribed and filed with the instructor.

Equipment. In addition to joint use with the other engineering departments of the testing laboratories described elsewhere, this department has a suite of well-lighted rooms, suitably arranged on the second floor of Mechanical Hall. This suite includes an office, recitation, and lecture rooms; an instrument room, and draughting and designing rooms, together with a well-equipped blue-print room with a cylindrical electrical blue-print machine, sun frames, and washing pans.

The draughting and designing rooms are well lighted and fully equipped with thoroughly modern and convenient drawing tables, supplied with individual lockers for instruments and other apparatus. The instrument room is conveniently arranged, having an individual glass-front case for each instrument and its accompanying equipment, which includes marking pins, tape, range-poles, notebook, etc. The instrument equipment includes the following: twelve transits, four of which are provided with solar attachment; nine levels, four plane-tables, one compass and two current meters, all high-class instruments of various standard makes and styles; a sufficient supply of level and stadia rods, range-poles, tapes, chains, plain and prismatic compasses, aneroid barometers, clinometers, planimeters, plumb-bobs, hand levels, etc., together with a well-selected assortment of specifications and blue-print plans of engineering structures for illustrative purposes.

DEGREE COURSE IN CIVIL ENGINEERING Semester

	Senior Year	
	1st	2nd
Highway Bridges (C. E. 513, 514).....	4	4
Engineering Seminar (C. E. 605, 606).....	1	1
Reinforced Concrete (C. E. 557).....	4	
Contracts and Specifications (C. E. 607).....		2
Electives (From group 1, 2, 3, or 4)	7	9
	<hr/> 16	<hr/> 16

	Semester	
	1st	2nd
Group 1		
Highway Engineering (C. E. 407)	4	
Economics of Highway Construction (C. E. 410)		2
Highway Laboratory (Advanced) (Exp. E. 233)	2	
Road Machinery (M. E. 302)		1
Precise Surveying and Geodesy (C. E. 252)		3
Electives	1	3
	—	—
	7	9
Group 2		
Sanitary Engineering (I. E. 701)	3	
Hydraulics Laboratory (Exp. E. 262)		2
Water Supply Engineering (I. E. 301)	4	
Hydraulic Pumps and Motors (I. E. 202) or Chemistry of Water (Chem. 403)		2
Study of Electric Machinery (E. E. 402)		4
Electives		1
	—	—
	7	9
Group 3		
Structural Engineering (C. E. 515, 516)	3	2
Study of Electric Machinery (E. E. 402)		4
Electives	4	3
	—	—
	7	9
Group 4		
Railway Engineering (C. E. 281, 282)	3	3
Study of Electric Machinery (E. E. 402)		4
Electives	4	2
	—	—
	7	9

COURSE IN HIGHWAY ENGINEERING

There are few lines of public endeavor where more money is being spent, or where a higher degree of technical skill and training is required, than in the field of highway engineering. The purpose of this course is to meet the demand in this State and throughout the Northwest for men equipped to take charge of road

and city street construction and maintenance work. Aside from the opportunity for useful and honorable service, no field, it is believed, offers greater encouragement in a financial way to the young man of ambition and ability.

Thorough theoretical instruction is accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, Drawing, Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department.

The department of Experimental Engineering is equipped with complete and thoroughly up-to-date testing laboratories, including the very latest and best cement- and highway-testing machinery, thus affording students in Highway and in Civil Engineering courses the opportunity of studying first hand the strength and properties of the various engineering materials.

In the study of highways, special reference is made to the conditions and needs of Oregon. Due consideration is given to the construction and maintenance of dirt, gravel, and broken-stone roads as well as to the higher types. In consequence of the vast area of the State, this class of roads must, of necessity, constitute the greater part of its highways for many years.

DEGREE COURSE IN HIGHWAY ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem. 100, 101)	3	3
Mechanical Drawing (C. E. 107)	3	
Engineering Drawing (C. E. 111)		3
Descriptive Geometry (M. E. 152)	3	
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Plane Surveying (C. E. 222)		5
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2)	1	1
Spherical Trigonometry (Math. 15)	1	
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

	Semester	
	1st	2nd
Sophomore Year		
Differential Calculus, Integral Calculus (Math. 51, 52)....	4	4
Engineering Physics (Phys. 101, 102)	4	4
Topographic Surveying (C. E. 223)	5	
Railroad and Canal Surveying (C. E. 272)		5
Gymnasium (Phys. Ed. 17, 18)	1½	1½
Drill (Military 3, 4)	1	1
Electives (Restricted)	3	3
	17½	17½
Junior Year		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Roads and Pavements (C. E. 405)	3	
Graphic Statics (C. E. 511)	2	
Hydraulics (I. E. 102)		3
Cement and Highway Laboratory (Exp. E. 231)	2	
Structural Materials Laboratory (Exp. E. 232)		3
Military Science (Theo. Inst. 1, 2)	1	1
Masonry and Foundations (C. E. 552)		3
Drill (Military 5, 6)	1	1
*Electives (Restricted)	3	3
	17	17
Senior Year		
Highway Bridges (C. E. 513, 514)	4	4
Engineering Seminar (C. E. 605, 606)	1	1
Reinforced Concrete (C. E. 557)	4	
Contracts and Specifications (C. E. 607)		2
Road Machinery (M. E. 302)	1	
Highway Engineering (C. E. 407, 408)	4	4
Economics of Highway Construction (C. E. 410)		2
Advanced Highway Laboratory (Exp. E. 233)	2	
**Electives		3
	16	16

*Approved Electives: English, Modern Language, Economics, National Government, State and Municipal Governments, Geology, Differential Equations, Least Squares.

**Chemistry of Road Materials, Design of Highway Structures or Materials. Laboratory (Advanced Course).

The following courses are offered:

107. Mechanical Drawing. The use of instruments and the elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, and finally, the complete development of a working blue print of some simple device from sketches. Particular attention is given to free-hand lettering, general neatness, and accuracy.

Highway, Irrigation, and Mining Engineering; first semester; 3 credits; 3 laboratory periods.

Fee: \$0.50. Text: French: Engineering Drawing.

111. Engineering Drawing. A continuation and extension of the previous work in drawing, with special reference to application in Highway and Irrigation Engineering. Practice in tracing and in blue and black line process printing will be given.

Prerequisite: C. E. 105.

The course in Highway Engineering and Irrigation Engineering; freshman year; second semester; 3 credits; 3 laboratory periods.

Fee: \$0.50. Text: French: Engineering Drawing.

222. Plane Surveying. This course includes recitations, lectures, field and office work in the theory and practice of plane surveying. The theory and construction of the different surveying instruments are studied, and practice will be given in making their tests and adjustments. The United States public land surveys and land laws are studied. Forms of field notes, methods of balancing and plotting surveys, computing areas and like work, will have due consideration. Proper emphasis will be placed upon chain surveying. Surveys will be made of assigned plots, and descriptions prepared. Resurveys will be made where more than ordinary difficulty is encountered in the interpretation of descriptions and existing evidence.

Prerequisite: Math. 11 and C. E. 107.

The course in Highway and Irrigation Engineering and Landscape Gardening; freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods.

Fee: \$1.00. Text: Breed & Hosmer: Plane Surveying.

223. Topographic Surveying. This course will include the execution of a complete topographic survey of an assigned tract, including the base line measurement, transit, stadia, and plane table work, plotting, and finishing the map.

Prerequisites: C. E. 222 and 107.

The courses in Highway Engineering, Irrigation Engineering, and Landscape Gardening; sophomore year; first semester; 5 credits; 1 recitation; 4 laboratory periods.

Fee: \$1.00. Text: Breed & Hosmer: Plane Surveying.

225. City Surveying. (Elective.) A study of the necessary precision; a survey of a portion of the city; also a new addition, including the preparation of plots, establishment of grades, etc.; survey and office work for preparation of plans for street improvement; preparation of estimates, etc.

Senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

Fee: \$1.00.

232. Plane Surveying. In this course substantially the same ground will be covered as in course 222, except that there will be but two-thirds as much field practice.

Prerequisites: Math. 11, 21, 31, and Mechanical Drawing.

The courses in Mining, Forestry, and Logging Engineering; freshman year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Text: Breed & Hosmer: Plane Surveying.

234. Plane Surveying. An abridgment of course 222 designed to meet the requirements of students in Forestry and Logging Engineering. As much time as possible will be given to the study and use of the type of instruments used in the Forestry service. Some time will be given to the retracing of lines from original descriptions and field notes and to different methods of determining the meridian.

Prerequisites: Math. 11, 21, 31, and Mech. Draw.

The courses in Forestry and Logging Engineering; freshman year; second semester; three credits; one recitation; 2 laboratory periods.

Fee: \$1.00. Text: Breed & Hosmer: Plane Surveying.

235. Topographic Surveying. A condensation of course 223, and in addition requires a rough topographic survey of a forested section.

Prerequisite: C. E. 232 or 222.

The courses in Forestry and Logging Engineering; sophomore year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

Fee: \$1.00. Text: Breed & Hosmer: Plane Surveying.

242. Farm Surveying and Leveling. This course is designed for Agricultural students, and consists of problems of chaining, elementary transit work, and in leveling. Most emphasis will be put upon leveling and its application to drainage and general irrigation work. Problems will be given in profile and contour work as applied to farm drainage, road construction, and irrigation.

Agricultural course; sophomore year; first semester; 2 credits; 1 recitation; 1 laboratory period.

Fee: \$1.00. Text: Pence & Ketchum: Surveyor's Manual.

243. Topographic Surveying. This course is designed especially for those taking the Irrigation Farming course, and is an enlargement on C. E. 242. A complete topographic survey and map of an assigned area will be made. Special emphasis will be put on the study of the relation of surface topography to methods of water distribution, drainage, etc., all illustrated by the assigned survey and map. Methods of locating ditches and of making estimates on grading for the same will be studied from the contour map.

Prerequisite: C. E. 242.

Irrigation Farming course; junior year; first semester; 2 credits; 2 laboratory periods with assigned lectures where required.

Fee: \$1.00. Text: Breed & Hosmer: Plane Surveying.

252. Precise Surveying and Geodesy. A study of the precise methods of surveying and leveling, base line measurements, precise triangulation, determination of true meridian and latitude.

Prerequisites: C. E. 222, 223, 272.

Elective; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.00.

254. Plane Surveying. This is a condensation of course 222, and is designed to meet the needs of Mechanical and Electrical students who have not time for the longer course.

The course in Electrical Engineering; junior year; second semester; 2 credits; 2 laboratory periods.

Fee: \$1.00. Text: Breed & Hosmer: Plane Surveying.

272. Railroad and Canal Surveying. This course will include a study of the simple compound, and vertical curves, and of earthwork. Students will solve many problems both in the class room and in the field, and will make a survey of a canal, highway, or railroad, including a reconnoissance, preliminary survey, location

survey, and estimates of earthwork. Emphasis will be placed on yardage estimates, cross-sectioning and earthwork computations, and details of construction.

Prerequisites: C. E. 222 and 223.

Highway and Irrigation Engineering and Landscape Gardening; sophomore year; second semester; 5 credits; 2 recitations; 3 laboratory periods.

Fee: \$1.00. Text: Allen: Railroad Curves and Earthwork.

274. Railroad Surveying. This course is designed especially for the Logging Engineering course, and takes up the survey of a railroad line through rough wooded country, including a reconnaissance, preliminary, and location surveys of such a line. A complete estimate of the yardage, and also of the cost of the road is made. The course also includes the study of the simple, compound, vertical, and transition curves.

Prerequisites: C. E. 223 or 233.

Course in Logging Engineering; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each.

Fee: \$1.00. Text: Allen: Railroad Curves and Earthwork.

281. Railway Engineering. Study of the methods of railway construction and maintenance, standard structures, trestles, tunnels, culverts, minor bridges, ballast, rails and rail supports and fastenings, yards and terminals. This course will be preceded by a brief review of the simple and compound curve and the railway spiral.

Prerequisite: C. E. 272.

Senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Text: Webb: Railway Construction.

282. Railway Engineering. Continuation of course 281.

Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Text: Webb: Railway Construction.

405. Roads and Pavements. A study of the fundamental principles of location, construction, and maintenance of roads, as well as a thorough study of the materials used in road and street building. Asphalt, brick, wood block, stone, concrete, and other forms of street pavements are carefully studied. This course is given in connection with a laboratory course, Exp. E. 131.

The courses in Highway Engineering, Irrigation Engineering, and Landscape Gardening; junior year; first semester; 3 credits; 3 recitations.

407. Highway Engineering. Economic grades and proper location for different soils and surfacing materials. Surface and sub-surface drainage. Culvert design and construction. Construction and maintenance of earth, sand-clay, gravel, macadam, concrete, brick, and other types of roads. Dust preventives and road binders. Preliminary surveys and estimates. Specifications.

Senior year; first semester; 4 credits; 3 lectures; 1 laboratory period.

408. Highway Engineering. Continuation of course 40.

Senior year; second semester; 4 credits; 2 lectures; 2 laboratory periods.

410. Economics of Highway Construction. Economic and social advantages of improved roads. The traffic census. Local and centralized systems of control. Highway laws of different states. Organization of construction and engineering forces. Cost data. Methods of handling work. Forms of contract—lump sum, unit price, percentage and cost plus fixed sum.

Senior year; second semester; 2 credits; 2 recitations.

511. Graphic Statics. The study of the graphic methods of the solution of stresses in cranes, derricks, and roof and bridge trusses, and such similar problems. The course is a draughting room course and is made up of a series of problems to be solved graphically and checked analytically.

The courses in Highway, Irrigation, and Mechanical Engineering; junior year, first semester; 2 credits; 2 laboratory periods of three hours each.

Fee: \$0.50.

513. Highway Bridges. Design of wood and steel highway bridges and trusses of the ordinary Pratt or Howe truss type, including the complete design, stress diagram, and detail drawings of the same. Both analytical and graphical methods will be applied to the determination of stresses in trusses under static and wind loads, and under static, moving, concentrated, and distributed loads.

Prerequisites: M. E. 251, 252.

Senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each.

Fee: \$1.00. Text: Spofford: Theory of Structures.

514. Highway Bridges. A continuation of course 513. Advanced work in highway bridge design is taken up, including draw, cantilever, suspension, and arch bridges.

Senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Text: Spofford: Theory of Structures.

515. Structural Engineering. This course will include the original design, with the stress sheets, plans, and working drawings for a roof truss, plate girder, pin-connected bridge, and steel arch.

Senior year; first semester; 3 credits; 3 laboratory periods.

Fee: \$1.00.

516. Structural Engineering. Continuation of course 515.

Senior year; second semester; 2 credits; 2 laboratory periods.

Fee: \$1.00.

552. Masonry and Foundations. A study of the properties of stone, brick, lime, cement, and concrete as building materials, and of their uses in foundations, retaining walls, piers, and dams; the theory of the masonry arch, retaining wall and dam. Recitations, lectures, and work in draughting and computing room.

The courses in Highway Engineering and Irrigation Engineering; junior year; second semester; 3 credits; 3 recitations.

555. Design of Highway Structures. A draughting-room course in the design of different kinds of structures required in highway work. It includes the design of short-span, reinforced concrete slab bridges, short-span I-beam bridges, culverts, tunnels, retaining walls for side-hill roads, etc. A study will be made also of the effect of drainage of roads and drainage areas upon the design of bridges

Highway Engineering course; elective; senior year; 2 credits; 2 laboratory periods.

Fee: \$1.00.

557. Reinforced Concrete. A study of the fundamental principles of reinforced concrete design as applied to beams, girders, and columns. Designs are made of beam, girder, slab, and arch reinforced concrete highway bridges, and also of reinforced concrete retaining walls and irrigation structures. A detailed drawing is prepared of one reinforced concrete highway bridge.

The courses in Highway and Irrigation Engineering; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00. Text: Turneoure & Maurebi: Principles of Reinforced Concrete.

605. Engineering Seminar. The members of the senior class in the courses of Highway and Irrigation Engineering, and the professors and instructors, constitute the Engineering Seminar, which meets once a week. The purpose of this seminar is to bring the student in touch with engineering literature and practice. To this end, a number of journal reviews and papers on engineering subjects will be presented and freely criticised each week. The work will follow a previously arranged program.

Senior year; first semester; 1 credit.

606. Engineering Seminar. See course 605.

Senior year; second semester; 1 credit.

607. Contracts and Specifications. A study of the general principles and laws of contracts as applied to engineering, including the preparation and study of specifications and contracts based upon engineering structures designed by the individual student.

Senior year; second semester; 2 credits; 2 recitations.

GRADUATE COURSE IN HIGHWAY ENGINEERING

From Tuesday, January 2, 1917, to end of first semester.

This short course in Highway Engineering is given by the department of Highway Engineering in cooperation with the departments of Experimental Engineering and Irrigation Engineering and is intended for graduate engineers who wish to specialize in some line of highway work, or for others properly prepared. The purpose of the course is to review the principles and current practice of Highway Engineering.

The various courses are complete in themselves and any one course may be taken without the others if the applicant's preparation is suitable for that course.

Instruction will be given by means of lectures, assigned reading, and laboratory practice. Special lectures by non-resident engineers will be provided where possible. No classes will be formed unless a sufficient number of students apply. During the year 1917 classes will not be arranged for more than 16 credit hours a week.

Those intending to take the course should write Professor Skelton in advance.

The following courses are offered:

Road Design. Two times a week.

Construction of Roads. Three times a week.

Highway Bridges. Three times a week.

Cement and Highway Laboratory. Three laboratory periods a week.

Street Design and Construction. Three times a week.

Reinforced Concrete Highway Structures. Three times a week.

Contracts and Specifications. Two times a week.

The Hydraulics of Highway Drainage and Construction. One laboratory period a week.

ELECTRICAL ENGINEERING

RICHARD HAROLD DEARBORN, Professor
LAWRENCE FISHER WOOSTER, Assistant Professor
WILLIS DHU AINE PEASLEE, Instructor
CHARLES ERNEST OAKES, Instructor

Since the advent of steam as a motive power, it is probable that no agency has so deeply affected the course of history and the intimate life of a large proportion of the human race as has the electric current, whether used in the transmission of intelligence, to furnish light, or to provide power for transportation and the industries.

Already the electrical industries are counted among the greatest in the world; their employees number more than a hundred thousand in the United States alone; their business in this country doubles every five years; and their field is ever expanding.

Notwithstanding this fact, most of the business is controlled by comparatively few corporations. The competition for desirable positions is therefore keen; and since the field in Electrical Engineering for the independent engineer is limited, only men of exceptional ability and energy attain the higher and more desirable positions.

Accordingly, no man is advised to take Electrical Engineering who does not consider himself, by taste and ability, exceptionally fitted therefor.

The College course is designed especially to train the young engineer in the theory of his profession, such practical work as is given in shop and laboratory being subordinated to this end. Practical acquaintance with actual conditions can be acquired only in

the field, during vacation and after graduation. For this reason, and in order to supplement his college education, the student is urged to spend at least a part of his vacation in some line of electrical industry.

Starting with the foundation subjects of mathematics, science, drawing, and shopwork, the student proceeds through the study of form expression in Descriptive Geometry, Mechanism, the laws of Mechanics, Strength of Materials, stress in structures and machinery; through the study of electricity and its application to machinery, the characteristic performance of electrical apparatus, its design and operation; through the study of thermodynamics as applied to various types of heat engines, and finally to the composite power system involving the steam or hydro-electric power plant and the system for transmitting and distributing electrical energy.

Equipment. The laboratory of this department occupies a large part of the west half of the first floor of Mechanical Hall, and is divided into several rooms, one for testing, one for instruments, and another for supplies. Besides the equipment therein, including generators, motors, and other apparatus, the machinery in the College Power Plant and sub-station, is available for study and testing purposes. Three-phase electrical energy is supplied by the long-distance transmission line or by the local generating unit as desired.

In the laboratory is a $6\frac{1}{2} \times 15$ foot switchboard, consisting of three asbestos wood panels on which are mounted a number of voltmeters and ammeters for direct and alternating current; a power factor meter; a frequency meter, and synchroscope; a set of synchronizing lamps; circuit breakers; switches; and a large number of plug terminals, the lead of which extend to the four machine platforms; two slate panels with instruments and switches for direct-current machines; and an arc light regulating panel. Immediately adjacent thereto is a controller, auto-transformer and rheostat rack, six feet high by sixteen feet in length.

The machine platforms just mentioned are four feet wide by fourteen feet long, and have upon them the following equipment: one five, one seven-and-a-half, one ten, and one fifteen horsepower, three-phase, induction motor; two five, two seven-and-one-half, two ten, and two twelve-and-one-half kilowatt, 125-volt direct-current generators; one ten-kilowatt double-current generator,

and one two-kilowatt rotary converter; two two-and-one-half kilowatt induction motor generator sets; one two-and-one-half kilowatt synchronous motor generator set; one seven-and-one-half kilowatt revolving field alternator, with three additional rotors, and one seven-and-one-half kilowatt revolving field alternator, from both of which current of one-, two-, three-, four-, and six-phases may be taken; one five-arc light regulating, one ten-kilowatt 110,000-volt high tension testing, one ten-volt 1000-ampere welding, one five kilowatt 15,000 volt wireless, three $7\frac{1}{2}$ kilowatt, 2200-220-110-volt transformers with ten taps each in the secondary, giving nine different voltages from 24 to 220 volts, with 87 percent taps in both primary and secondary for transformation from three- to two-phase or the reverse, and a number of ordinary transformers and compensators.

The instruments available comprise standard portable volt, ampere, and watt meters which are divided into two groups, one of which is used for routine laboratory work, the other reserved for thesis and other tests in which greater accuracy is desired. In addition to this equipment, the departments of Physics and Electrical Engineering maintain an instrument standardization laboratory equipped with two one-hundred ampere storage cells and a group of dry cells to furnish potentials up to one hundred and fifty volts. The precision instruments and apparatus consist of a Leeds and Northrup potentiometer with certified standard cells and a complete line of standard shunts from one one-thousandth to ten ohms, a Weston laboratory standard voltmeter with ranges of 1, 100, and 200 volts and Siemens and Halske laboratory standard ammeters with ranges from 2.5 to 50 amperes and a similar wattmeter with five and ten ampere range.

DEGREE COURSE IN ELECTRICAL ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
Trigonometry, College Algebra (Math. 11, 21)	5	
Elementary Analysis (Math. 31)		5
General Physics (Phys. 1, 2)	3	3
Mechanical Drawing (M. E. 151)	2	
Descriptive Geometry (M. E. 152)		3
Foundry (Ind. Arts 171)	2	
Woodworking (Ind. Arts 112)		2
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Modern English Prose (Eng. 81, 82) or Adv. German or Adv. French (Mod. Lang. 207, 208, or 107, 108)*	3	3
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Sophomore Year		
Differential and Integral Calculus (Math. 51, 52)	4	4
Electrical Physics (Physics 105)	3	
Electrical Measurements (Physics 106)		3
General Chemistry (Chem. 100, 101)	3	3
Introduction to Electrical Engineering (E. E. 121, 122)....	1	1
Mechanical Drawing (M. E. 153)	3	
Mechanism (M. E. 204)		3
Blacksmithing (Ind. Arts 151)	2	
Machine Shop (Ind. Arts 206)		2
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

*By special permission a student may elect beginning German or French, (Modern Language 201, 202, or 101, 102).

	Semester	
	1st	2nd
Junior Year		
Electrical Engineering (E. E. 101, 102)	4	4
Electrical Engineering Laboratory (E. E. 201, 202)	3	3
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Steam Machinery (M. E. 307)	3	
Hydraulics (I. E. 102)		3
Plane Surveying (C. E. 254)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	—	—
	17	17
Senior Year		
Electrical Engineering (E. E. 103, 104)	4	3
Electrical Design (E. E. 105)		1
Electrical Laboratory (E. E. 203)	3	
Electric Railways (E. E. 309)	2	
Illuminating Engineering (E. E. 316)		2
Telephony and Telegraphy (E. E. 313)		2
Applied Mechanics Laboratory (Exp. E. 205)	3	
Power and Hydraulic Laboratory (Exp. E. 206)		3
Optional	4	5
	—	—
	16	16
Suggested Options		
Steam Power Plant Design (M. E. 316)	3	
Public Service Regulation (E. E. 317)	2	
Periodical Literature (E. E. 301)	1	
Practical Public Speaking (English 105)	3	
Central Stations (E. E. 318)		2
Electrical Laboratory (E. E. 204)		3
Electric Railways (E. E. 310)		3
High Voltage Engineering (E. E. 308)		2
Thesis (E. E. 306)		2

The following courses are offered:

101. **Electrical Engineering.** Study of the sine wave and periodic alternating quantity; harmonic analysis; laws governing the flow of current and energy; the magnetic and electrostatic

circuit, production of rotating field by means of polyphase alternating currents in a distributed winding; losses in electric circuits; elementary theory of transmission lines.

Open only to juniors in Electrical Engineering. Course 101 must be taken concurrently with 201, and 102 concurrently with 202.

Junior year; first semester; 4 credits; 4 recitations.

Text: Christie: Electrical Engineering.

102. Electrical Engineering. Continuation of course 101.

Junior year; second semester; 4 credits; 4 recitations.

Text: Christie: Electrical Engineering.

103. Electrical Engineering. A study of the equipment of power plants, transmission lines, and distributing systems, and of the technical and economic problems connected with the generation, transmission, and distribution of electrical energy.

In connection with this course, inspection trips are made to the properties of various power companies. The expense of these trips will approximate twenty dollars, and should be anticipated by every Electrical Engineering student in his senior year.

Prerequisites: E. E. 101, 102, 201, 202.

Senior year; first semester; 4 credits; 4 lectures.

104. Electrical Engineering. A continuation of course 103.

Senior year; second semester; 3 credits; 3 lectures.

105. Electrical Design. The design of transmission lines and distribution systems, both overhead and underground, with particular attention to costs.

Senior year; second semester; 1 credit; 1 lecture.

121. Introduction to Electrical Engineering. A general survey of the field of electrical engineering and the applications of electricity.

Sophomore year; first semester; 1 credit; 1 recitation.

Text: Norris: An Introduction to the Study of Electrical Engineering.

122. Introduction to Electrical Engineering. A continuation of course 121.

Sophomore year; second semester; 1 credit; 1 recitation.

Text: Norris: An Introduction to the Study of Electrical Engineering.

201. Electrical Engineering Laboratory. Open only to juniors in Electrical Engineering and must be taken concurrently with

101, which it parallels. Study of electrical instruments; wave form and polarity of alternating currents; current, electromotive force and power relations in circuits involving resistance, inductance, and capacity; principles of operation of direct current dynamos and motors.

Consists of one laboratory period a week. Student is required to submit a preliminary report before performing experiment, and a final report upon its completion.

Junior year; first semester; 3 credits; 1 laboratory period.

Fee: \$2.50. Deposit: \$3.00. Text: Karapetoff: Experimental Electrical Engineering.

202. Electrical Engineering Laboratory. Continuation of course 201. Must be taken concurrently with course 102. Study of hysteresis and eddy current losses in magnetic circuits, electromotive force and energy losses in electrical circuits; the separation of losses in direct current machinery; efficiency and loading tests of direct and alternating current machinery; properties of insulating materials.

Junior year; second semester; 3 credits; 1 laboratory period.

Fee: \$2.50. Deposit: \$3.00. Text: Karapetoff: Experimental Electrical Engineering.

203. Electrical Engineering Laboratory. Characteristic performance of alternating current machinery, including alternator, synchronous and induction motor, synchronous converter and static transformer with parallel operation and pump back tests.

Preliminary and final reports are required.

Prerequisites: E. E. 101, 102, 201, 202.

Senior year; first semester; 3 credits; 1 laboratory period.

Fee: \$2.50. Deposit: \$3.00. Text: Karapetoff: Experimental Electrical Engineering.

204. Electrical Engineering Laboratory. Complete engineering and commercial tests on standard electrical machinery, including standard acceptance tests on machines and plants, and special tests for engineering information. Tests will be run on outside plants under commercial operating conditions.

Prerequisite: E. E. 203.

Technical engineering reports are required.

Senior year; second semester; 3 credits; 1 laboratory period.

Fee: \$2.50. Deposit: \$3.00.

301. Study of Current Periodical Literature. Presentation of abstracts and discussion of current articles in electrical periodicals. Special emphasis will be laid upon English, address, and manner of presentation.

Elective to seniors in Electrical Engineering.

Senior year; first semester; 1 credit; 1 recitation.

Text: Current Periodicals.

306. Thesis. Elective, by permission to seniors in Electrical Engineering. Only those whose past record indicates ability successfully to complete a satisfactory thesis, will be permitted to make this election.

Senior year; second semester; 2 credits.

308. High Voltage Engineering. A study and experimental investigation of high voltage and high frequency phenomena.

Elective to seniors in Electrical Engineering.

Senior year; second semester; 2 credits; 2 recitations.

Text: Peek: Dielectric Phenomena in High Voltage Engineering.

309. Electrical Railways. A general study of the application of electricity to street and interurban railways, covering traffic conditions, speed, time, curves, and rolling stock.

Prerequisites: E. E. 101, 102, 201, 202, or E. E. 403.

Required of seniors in Electrical Engineering.

Senior year; first semester; 2 credits; 2 recitations.

Text: Harding: Electric Railway Engineering.

310. Electric Railways. Continuation of course 309. A study of conditions governing the electrification of trunk lines; systems of electrification and transportation economics.

Prerequisite: E. E. 309.

Senior year; second semester; 3 credits; 3 recitations.

Text: Electric Traction for Railway Trains.

313. Telephony and Telegraphy. A general study of the application of electricity to the transmission of intelligence. Manual and automatic telephony, duplex and quadruplex telegraphy, submarine and wireless telegraphy.

Prerequisites: E. E. 101, 102.

Senior year; second semester; 2 credits; 2 recitations.

316. Illuminating Engineering. A study of artificial light sources and the application of these sources to illumination, both exterior and interior.

Senior year; second semester; 2 credits; 2 recitations.

Text: Wickenden: Illumination and Photometry.

317. Public Service Regulation. A study of regulation by commissions, service rules, appraisals, depreciation, and rate making.

Senior year; first semester; 2 credits; 2 recitations.

Text: Hayes: Public Utilities.

318. Central Stations. A study of the problems arising in the operation of electric systems. Operating problems, public policy, competition, cost accounting, rate study, extensions, etc.

Senior year; second semester; 2 credits; 2 recitations.

403. Study of Electrical Machinery. Open to non-electrical students in the School of Engineering. A practical course designed to meet the needs of Civil, Mechanical, and Mining Engineers. Class room and laboratory study of electrical instruments, current, electromotive force and power relations; the operation, care, and management of familiar types of dynamos, motors, both alternating and direct current, and transformers.

Required of seniors in Mechanical, Logging, and Mining Engineering and of certain groups in Civil Engineering.

Prerequisites: Elementary Chemistry, Physics, Calculus, Mechanics.

Junior or senior year; first semester; 3 credits; 1 recitation; 1 laboratory period.

Fee: \$2.50. Deposit: \$3.00. Text: Gray: Principles and Practice of Electrical Engineering.

406. Electrical Lumbering Machinery. A special study of the application of electricity to the lumbering and logging industry.

Prerequisite: E. E. 403.

Senior year; second semester; 2 credits; 2 recitations.

408. Electric Mining Machinery. A study of the use of electricity in mines and mining operations.

Prerequisite: E. E. 403.

Senior year; second semester; 2 credits; 2 recitations.

410. Electric Machine Drive. The characteristics of electric motors and their applications to machine shop tools and allied industries.

Prerequisite: E. E. 403.

Senior year; second semester; 2 credits; 2 recitations.

EXPERIMENTAL ENGINEERING.

SAMUEL HERMAN GRAF, Professor
CARL LAFAYETTE KNOFF, Instructor
RAY BOALS, Instructor
FRED MERLE MILLER, Instructor

The courses in engineering laboratory practice are designed to familiarize the student with processes of investigation; to afford experience in conducting and reporting experimental engineering work; to secure data which shall verify and supplement theoretical instruction; and, to some extent at least, to give a practical knowledge of construction and management of machinery and apparatus.

Appropriate divisions of this work are regularly taken by students in all branches of Engineering, Forestry, and Industrial Arts, and may be elected by students in other courses. Special courses are offered, as listed in what follows, to meet the needs of the students in the different lines of work. An earnest effort is made, not so much to impart a mass of detail, as to develop in the student his powers of observation and his capacity for independent thought.

Reports are required of all experiments, and are regarded as a most important part of the work. They are carefully read and criticised as to form, neatness, conciseness, accuracy of expression and spelling, as well as accuracy of technical data and calculations. With this training, when the student completes the work, he should know how to prepare an acceptable engineering report, or how to arrange data for publication.

Equipment. Appropriate portions of the equipment for this work are utilized by all departments in Engineering and Forestry. The equipment comprises the following divisions: a materials-testing laboratory, a cement-testing laboratory, a steam laboratory, and a gas-engine and hydraulic laboratory. These divisions have in common the equipment for the preliminary work, such as calculating devices, planimeters, Amsler integrator, micrometers, and other general apparatus.

The materials-testing laboratory occupies the northwest corner of the first floor of Mechanical Hall and contains the following: a 150,000-pound Riehle universal testing machine fitted with extension table for beams up to 16 feet in length; a 50,000-pound Riehle automatic and autographic testing machine; a 60,000-pound-inch Olsen torsion-testing machine; a 400-foot-pound drop-testing ma-

chine and a static load-testing machine, both of which were built in the College shops; a Case tempering furnace with pyrometer; Scleroscope and Brinell ball hardness testers; Tassin metallographic outfit; and auxiliary apparatus including a deformeter, torsion indicator, compression micrometers, several extensometers, deflectometers, and other minor pieces.

A part of the materials laboratory also is devoted to the testing of materials for highway construction. This equipment includes the following: Olsen impact machine for toughness tests; Riehle machine for hardness tests; ball mill, molding machine, and impact machine for cementing value tests on rock dust; rattler for abrasion tests on macadam or paving-rock, another for paving-brick; core drills and saw for cutting stone specimens; shakers and sieves for mechanical analysis of sand and aggregates, including a set of Tyler standard screen scale sieves; penetrometer, viscosimeter, float test, Osborne adhesive machine, centrifuges, and other appliances for making physical tests of bituminous cements and road oils.

The cement testing laboratory, also located in Mechanical Hall, is equipped with convenient iron-topped tables for mixing, intended to accommodate six students each. Apparatus is provided sufficient for making all the standard A. S. C. E. tests, as well as for some additional experiments. There are a large number of briquette, cube, and special cylinder molds, three Vicat needles, Gillmore needles, screens, including a standard set, damp closet, aging tanks, boiling test apparatus, autoclave, briquette molding machine, a 1000-pound Fairbanks cement-testing machine, permeability apparatus for testing various mixtures or water-proofing compounds, and small apparatus including balances, specific gravity flasks, trowels, sampling irons, etc.

The steam laboratory, located in the New Heating Plant, contains the following machines: a 7x8 throttling engine used principally for experiments on valve setting, a 9x10 Ideal automatic high-speed engine driving a 30 KVA, 3-phase generator, a 15 BHP, two-stage Kerr turbine, an 8x18 simple Murray Corliss engine, and a 6¼ and 10½x6¼ Sturtevant vertical compound engine. The last three of these are so arranged that they may be run either condensing or with atmospheric exhaust. The condenser and vacuum pump are so equipped that the cooling water may be measured by means of a Venturi meter and the condensed steam

by a Kennicott water-weigher. The engines are all fitted with gauges, sampling pipes, indicator connections, and brakes of various types.

For tests on boilers and their auxiliaries there are available the equipments of both the new and the old heating plants. The former consists of three Flanner water-tube boilers aggregating 700 horse-power; these are oil fired and fitted with modern auxiliary equipment, including feed water and oil meters, thermometer wells, flue gas sampler, etc. In the old plant there are three fire-tube boilers of about 170 horse-power total capacity, for which cord wood, and waste from the College wood shop are used for fuel.

Of smaller power laboratory equipment there may be mentioned a General Electric steam meter, pressure gauge tester, Schaeffer and Budenberg indicator calibrating device, seven indicators including a Trill instrument for continuous diagrams, several reducing wheels, two steam calorimeters, flue gas analysis apparatus, two pyrometers, draught gauges, recording and indicating pressure gauges, etc.

For work on power transmission, a transmission dynamometer and a special belt-testing machine are provided. Tests may also be made on lubricants, bearing metals, and different types of bearings, by means of a Golden bearing and oil dynamometer, or a pendulum type oil testing machine. There are also at hand the usual minor pieces, as flash point apparatus, viscosimeter, etc.

The gas engine and hydraulic laboratory is located in the old Power Plant building. The gas engine equipment consists of three four-cycle and three two-cycle gasoline and oil engines, and an 8-inch Reeco-Ericson hot-air engine. All of these are especially fitted for testing and demonstration, the largest, a 20-H. P. Bessemer oil engine, being direct connected to a high pressure pump. In the same room are also installed a Gardner air compressor and two centrifugal blowers for work on air compression and transmission. The hydraulic section contains the following: a centrifugal pump driven by a rated variable speed motor, several steam pumps, a 4x6 Goulds triplex pump, 12-inch Doble laboratory water motor, hydraulic ram, 2-inch Venturi meter, current meter, two ordinary service meters, calibrating tanks, orifice boxes with suitable plates and orifices, weirs, hook gauge, and other small apparatus. In ad-

dition to work in the laboratory, measurements and tests of neighboring streams and installations may be made.

The following courses are offered:

201. Applied Mechanics Laboratory. A study of experimental investigation, reduction of data, mechanical calculating devices, and the preparation of neat, concise, and accurate reports. The calibration of various measuring instruments such as gauges, pyrometers, transmission dynamometers, etc., is then taken up. After this follow exercises in the measurement of power, including a test of the transmitting capacity and slip of belting. Transverse, tensile, compressive, torsion, and other standard tests of the common materials of construction are made; the heating value of a sample of coal is determined; the course being then concluded by two exercises on the properties of an assigned lubricating oil.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. Statics and Dynamics, (M. E. 251), and Theory and Practice of Steam Engineering, (M. E. 305), should also be taken in conjunction with this course.

Course in Mechanical Engineering; junior year; first semester; 3 credits apportioned as follows: preparation, $\frac{1}{2}$ credit; laboratory, 1 credit; report, $1\frac{1}{2}$ credits.

Fee: \$3.00. Text: Carpenter & Diederichs: Experimental Engineering.

202. Power and Hydraulic Laboratory. A continuation of course 201, beginning with the use and calibration of the indicator and planimeter. Tests are then made on steam and gas engines, a boiler, an impulse water wheel, pumps, an air compressor, and other power equipment. Exercises are given in the setting of Corliss and slide valves, and the course is concluded with an economy test of a steam turbine operating condensing.

This work is covered in fifteen laboratory exercises, one each week, and a careful report of each experiment is required.

Prerequisite: Exp. E. 201. Advanced Steam Engineering, (M. E. 306), must be taken in conjunction with this course.

Course in Mechanical Engineering; junior year; second semester; 3 credits; apportioned as for course 201.

Fee: \$3.00. Text: Carpenter & Diederichs: Experimental Engineering.

203. Advanced Mechanics Laboratory. A rather general course in experimental mechanics dealing with more advanced studies of materials, fuels, lubricants, bearing metals, belting, etc., with special reference to the application of the results to the requirements of the mechanical engineer in actual practice. Reports required.

Prerequisites: Exp. E. 201 and 202.

Course in Mechanical Engineering; senior year; first semester; 3 credits, apportioned as for courses 201 and 202.

Fee: \$3.00. Text: Carpenter & Diederichs: Experimental Engineering.

204. Advanced Power Laboratory. A course similar in nature to the preceding, but dealing with power and hydraulic machinery. Various tests and studies are made on the following: a triplex pump, an air compressor, a centrifugal blower, a steam turbine, a compound engine, and finally, a complete test of a simple condensing Corliss engine, including the heat balance and a verification of Clayton's analysis. Complete reports required.

Prerequisite: Exp. E. 203.

Course in Mechanical Engineering; senior year; second semester; 3 credits; apportioned as for the preceding.

Fee: \$3.00. Text: Carpenter & Diederichs: Experimental Engineering.

205. Applied Mechanics Laboratory. Fifteen experiments consisting of exercises selected chiefly from courses 201 and 203. A course designed especially for the seniors in Electrical Engineering.

Prerequisites: Phys. 101 and 102, Math. 51 and 52, and all of the Mechanical Engineering courses required of Electrical Engineering juniors. Advanced Steam Engineering (M. E. 306), should be taken in conjunction.

Course in Electrical Engineering; senior year; first semester; 3 credits, distributed as for course 201.

Fee: \$3.00. Text: Moyer: Power Plant Testing.

206. Power and Hydraulic Laboratory. Similar in grade and purpose to the preceding. Consists of exercises selected from courses 202 and 204.

Prerequisite: Course 205.

Course in Electrical Engineering; senior year; second semester; 3 credits, apportioned as in the preceding.

Fee: \$3.00. Text: Moyer: Power Plant Testing.

207. Applied Mechanics Laboratory. This course is similar, in range of equipment studied, to course 201, but since it is intended for students in the Industrial Arts course who do not have some of the theoretical work in power engineering, the work is taken up in a more general manner, stress being laid on those principles and details which are of special value to the teacher of manual training. Some time is also taken to explain the theory involved, and the students are taught to prepare neat and accurate reports of their work.

Prerequisites: Mat. 11, and Phys. 1 and 2.

Course in Industrial Arts; senior year; first semester; 3 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 2 credits.

Fee: \$3.00. Text: Moyer: Power Plant Testing.

208. Power and Hydraulic Laboratory. A course similar in grade to the preceding, designed for seniors in the Industrial Arts course. The work consists of fifteen laboratory exercises along the lines of those for course 202, and the usual reports are required.

Prerequisite: Exp. E. 207.

Required in Industrial Arts; senior year; second semester; 3 credits, apportioned as for course 207.

Fee: \$3.00. Text: Moyer: Power Plant Testing.

210. General Engineering Laboratory. A course designed for seniors in Mining Engineering and Ceramics, or for others who desire a brief, comprehensive course in mechanical laboratory practice. The work consists of ten exercises selected from courses 201 and 202, and embraces tests on materials, hydraulic machinery, and steam and gas engines. Reports are required as in the preceding.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52.

Courses in Mining Engineering and Ceramics; senior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 1 credit.

Fee: \$2.00. Text: Moyer: Power Plant Testing.

231. Cement and Highway Laboratory. An experimental study of Portland cement; standard A. S. C. E. and other methods of cement testing; examination of sands, grading of aggregates, determination of voids, etc., abrasion, hardness, toughness, cementing value, and other tests on macadam rock; tests of paving brick; standard tests on bituminous compounds.

This course is of broad scope, but is still sufficiently detailed to give the student a good working basis for the intelligent interpretation and preparation of specifications for the materials treated.

Prerequisites: Phys. 101 and 102 and Math. 51 and 52. Roads and Pavements, (C. E. 405), should be taken in conjunction with this course.

Courses in Highway Engineering and Irrigation Engineering; junior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 1 credit.

Fee: \$3.00. Text: Hatt & Scofield: Laboratory Manual for Testing Materials. U. S. Office of Public Roads' Bulletins, No. 38 and 44.

232. Structural Materials Laboratory. Standard tests of timber, iron, steel, brick, stone, etc., with special reference to the methods and specifications adopted by the American Society for Testing Materials, and other national engineering organizations. Following the general tests, some time is devoted to work on plain and reinforced concrete.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. This course should be preceded by course 231, and Strength of Materials (M. E. 252), should be taken in conjunction with it.

Courses in Highway and Irrigation Engineering; junior year; second semester; 3 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 2 credits.

Fee: \$3.00. Text: Hatt & Scofield: Laboratory Manual for Testing Materials.

233. Advanced Highway Laboratory. Following course 231, and designed particularly for those specializing in Highway Engineering. Different road and paving materials and binders are tested and their relative values determined. Sheet asphalt mixtures and bituminous mortars are studied, to determine the effects of various changes in the grading of the aggregates. Finally, samples of various types of roads and pavements are analyzed for density, composition, and grading, with special reference to their conformity with specifications under which built.

Prerequisites: Exp. E. 231, and C. E. 405.

Course in Highway Engineering; senior year; first semester; 2 credits; apportioned 1 to laboratory work and 1 to report.

Fee: \$3.00.

235. Advanced Materials Laboratory. An advanced course offered as an elective to students who have completed course 232, and who desire additional laboratory work on materials. In the past, tests have been made on reinforcing steel, reinforced beams, hooped columns, water-proofing of concrete, thermal conductivity of concrete, study of stresses by strain gauge, etc., but the course is varied according to the special interests and desires of the students electing the work.

The course on Reinforced Concrete (C. E. 557), must either precede this course or be taken at the same time. The course cannot be given unless elected by at least five students.

Either semester as desired by majority; 2 credits: laboratory, 1 credit; report, 1 credit.

Fee: \$3.00.

238. Timber Testing. A special course designed to meet the requirements of the students in Forestry. The work is covered in eight laboratory exercises, embracing cross-bending, compression, sharing, cleavage, and other standard tests of timber; a study of the effect of moisture content on strength; and a study of impact loads. The formulas for the reduction of data from tests are explained; and the students are taught the preparation of neat, accurate reports, such being required on all tests. In general, the methods and bulletins of the U. S. Forest Service will be used as a guide in the work.

Prerequisites: Phys. 1 and 2.

Course in Forestry; senior year; second semester; 1 credit.

Note: The work is covered in one three-hour laboratory period a week during the first half of the semester, for which one-half credit is allowed. The other half credit is given for the reports.

Fee: \$2.00. Text: Record: Mechanical Properties of Wood.

240. Logging Materials. A course for students in Logging Engineering, identical for the first half of the semester with course 238. During the second half of the semester studies and tests are made on the materials of particular interest to the logging engineer, as for example, bending tests on full-size timbers, tension tests on cable, rope, and on wrought iron tie rods, etc. In all these experiments time is taken to explain the principles involved, and to point out their practical applications.

Prerequisites: Phys. 101 and 102.

Course in Logging Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit.

Fee: \$3.00. Text: Record: Mechanical Properties of Wood.

255. Steam Laboratory. A brief practical course on steam engines, boilers, and auxiliaries, intended for students in Logging Engineering. The work consists of eight exercises, including tests and studies of the following: pressure and vacuum gauges; steam calorimeters; injectors and feed pumps; boilers; slide-valve, automatic, and Corliss engines. A report is required for each exercise.

Note: Elementary Steam Engineering (M. E. 303), must be taken in conjunction with this course.

Course in Logging Engineering; junior year; first semester; 1 credit.

Fee: \$2.00.

262. Hydraulic Laboratory. Study of methods of measuring water, calibration of weirs, orifices, water meters, etc. Determination of friction and loss of head in pipe lines and fittings. Study of water hammer, and test of hydraulic ram. Tests on water wheel, centrifugal, triplex, and other pumps. The work is covered in fifteen three-hour laboratory exercises, and a report of each test is required.

Prerequisites: Math. 51 and 52, and I. E. 102.

Course in Irrigation Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit.

Fee: \$2.00.

265. Hydraulic Laboratory. A brief course of a practical nature intended to accompany the course in Hydraulics (I. E. 101), for students in Irrigation Farming. Studies and tests are made on the following: pressure and vacuum gauges; methods of measuring water; flow of water through pipes and orifices; hydraulic ram; water wheel; and various types of pump. The work is covered in eight laboratory exercises, a report being required for each.

Note: Hydraulics, I. E. 101, must be taken in conjunction with this course.

Course in Irrigation Farming; senior year; first semester; 1 credit.

Fee: \$2.00.

272. Gas-Engine Laboratory. Study of mechanical details of engines, battery and magneto ignition systems, carburetors, and methods of governing. Analysis of gas engine cycles from indi-

cator diagrams. Mechanical efficiency, regulation, and fuel economy tests. Economy, power, and tractive effort of automobiles.

The work is covered in fifteen laboratory exercises, and a report is required for each.

Prerequisite: The course on Internal Combustion Motors (M. E. 346), must either precede the course, or be taken in conjunction with it.

Course in Mechanical Engineering; senior year; second semester; 2 credits; laboratory, 1 credit; reports, 1 credit.

Fee: \$2.00.

291. Experimental Research Problems. An opportunity is given for advanced and suitably prepared students who are interested in engineering research, to work out original problems. These may be either of their own choosing, or suggested by the department, and may cover any subject within the scope of the department laboratories.

Prerequisites: Must be approved in each case, as they would vary with the work proposed.

Elective to seniors and graduate students; first semester; 2 credits.

Fee to be arranged.

292. Experimental Research Problems. A continuation of course 291.

Elective to seniors and graduate students; second semester; 2 credits.

Fee to be arranged.

INDUSTRIAL ARTS

HENRY CLAY BRANDON, Professor
WILLIAM McCULLY PORTER, Instructor
AMBROSE ELLIOTT RIDENOUR, Instructor
HARVEY GODFREY McCOMB, Instructor
CHARLES GEORGE WILTSHIRE, Instructor
DARWIN GREENE THAYER, Instructor
WALTER FRANKLIN MADDISON, Instructor

There is a steadily increasing demand in Oregon for competent teachers of manual training. These instructors teach in both the elementary and high-school grades. In fact, the up-to-date school provides for manual, or constructive, work of various kinds from the first grade up. The well-trained teacher must therefore understand both the technique and theory of his subject as adapted to the needs of pupils.

Below the seventh grade this manual instruction for both boys and girls is given by the regular grade teachers; but the supervisor and special teacher of manual training should be able to organize this work and correlate it with the other school subjects, and particularly with the later formal course in manual arts. For the boys, this will take the form of instruction in woodworking, metals, machine shop, and in some schools, vocational training in the various trades. For the girls, it will lead to the study of the several phases of home economics.

A college degree course of the same general standard as the other B. S. courses is provided, in order that the young men who specialize in this field may receive a preparation that will place them on a par with high-school teachers in other branches. The relation of industrial instruction in the elementary and secondary schools to the industries of life, is more fundamental and direct than most of the other branches taught. It also has its important relations to higher education. It becomes necessary, therefore, to give these instructors a training that will make them more than masters of the mechanical processes.

The properly prepared teacher of industrial arts must have an appreciative understanding of the origin and development of the industries; their relation to economic, social, and political life; and a profound conviction of the importance and dignity of their contribution to the progress of mankind. He should also have the broad sympathies of the cultured man, in order to enable him to set before his pupils high and worthy ideals of life. The artisan, artist, or professional man is first of all a man and a citizen, and our schools must make him aware of his high privileges and responsibilities.

The Industrial Arts department is a part of the School of Engineering and has under its supervision all the shop courses offered in the other departments of the College.

Equipment. This department provides the necessary equipment for carrying on the different lines of shop work in the degree and vocational courses.

The Wood Shop, supplied with the best machines and tools the market affords, contains twenty-four double benches of modern design, accommodating forty-eight students. Each bench is provided with patent rapid action vises for holding the work, and is furnished with two sets of hand tools, consisting of rip-saws, cut-

off saws and backsaws, planes, chisels, paring gouges, marking gauges, try-squares, hammers, dividers, and oilstones. The machine equipment of this shop consists of fifteen wood-turning lathes, each furnished with a set of tools; one iron saw-table with rip and cut-off saws, one band saw, one jig saw, 24-inch surface planer, 16-inch glue joiner, post boring machine, one hollow chisel mortiser and one belt sander, built by the students, and two grindstones. There are also two glue tables with clamps of various sizes and one steam and gas glue heater of three gallons capacity. The power is furnished by a three-phase induction motor of 15-horse-power.

The Forge Shop contains forty-two down-draught forges of the most approved pattern. Blast is furnished by a steel pressure blower driven by a 10-horse-power induction motor, and the smoke and gases are removed by an 80-inch exhaust fan, driven by a 20-horse-power motor. Each forge is provided with anvil, hammers, hardies, tongs, and other small tools. An emery grinder, built by students, has been added to the equipment. There are also swedge blocks and vises at convenient points in the room for general use.

The Machine Shop contains one 24x24-inch iron planer, one 15-inch shaper, one 12-inch shaper, one universal milling machine, one universal tool grinder, one wet tool grinder, one radial drill, one 20-inch drill press, one sensitive drill press, one 20-inch engine lathe, one 16-inch engine lathe, one 16-inch universal turret lathe, one 14-inch modern geared lathe, five 14-inch engine lathes, two 10-inch speed lathes, one shop saw, one automatic knife grinder, and twelve bench vises. A 20-horsepower induction motor furnishes the power. A tool room adjacent contains the small tools, such as twist drills, taps, dies, reamers, calipers, gauges, and scales. These tools are given out to the students on the check plan.

The Plumbing and Steam Fitting Shop is equipped with all of the hand tools necessary for cutting, threading, and general pipe work, as well as gasoline torches, soldering outfits, and other apparatus for making lead-pipe connections and wiped joints.

The Foundry contains a 22-inch Colliau cupola having a capacity of two tons per hour, one 1200-pound crane ladle, one 800-pound crane ladle, bull ladles, and hand ladles, one 16-inch brass furnace, brass molder's tub, crucibles, one large core-oven, one portable core-oven, one two-ton jib crane, one wall crane for

charging floor, one Delano pulley molding machine No. 2, besides shovels, rammers, and small tools to accommodate twenty students at one time. An emery grinder, built by the students, has just been added.

DEGREE COURSE IN INDUSTRIAL ARTS

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 81, 82)	3	3
Trigonometry (Math. 12)		3
Commercial Geography (Com. 200)	3	
General Chemistry (Chem. 100, 101)	3	3
Shop Drawing (Ind. Arts 301, 302)	2	2
Manual Training (Ind. Arts 103, 104)	3	3
Industrial Arts Drawing (Art 411)		2
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	16 $\frac{1}{2}$	17 $\frac{1}{2}$
Sophomore Year		
Modern Language or Approved Elective.....	3	3
General Physics (Phys. 1, 2)	3	3
Patternmaking, Foundry (Ind. Arts 135, 174)	3	3
Woodwork (Ind. Arts 113)	2	
Industrial Arts Design (Art 412)	1	
Drawing (M. E. 156)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
Electives	3	3
	<hr/>	<hr/>
	16 $\frac{1}{2}$	16 $\frac{1}{2}$

INDUSTRIAL ARTS

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	Semester	
	1st	2nd
Junior Year		
Modern Language or Approved Elective.....	3	3
General Psychology (Ind. Ed. 101)	3	
Educational Psychology (Ind. Ed. 102)		2
Principles of Education (Ind. Ed. 131)		3
Forging (Ind. Arts 155)	2	
Hammered Metal Work (Ind. Arts 156)		2
Elementary House Planning (Arch. 701)	3	
Descriptive Geometry (M. E. 152)		3
Commercial Woods (For. 506)	2	
Plumbing (Ind. Arts 270)		2
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
Electives	2	
	17	17
Senior Year		
Special Methods (Ind. Ed. 172, 173)	2	2
History and Theory of Vocational Education (Ind. Ed. 125)	2	
Machine Shop (Ind. Arts 208, 209)	2	2
Manual Training for Elementary Grades (Ind. Arts 231)		2
Machine Drawing and Design (M. E. 207)	3	
Applied Mechanics Lab. (Exp. E. 207)	3	
Power and Hydraulics Lab. (Exp. E. 208)		3
Electives	8	6
	16	16

The following courses are offered:

C-1. Carpentry and Cabinetmaking. The purpose of this course is to teach the pupil the elements of joinery as applied in cabinetmaking and the building trades. The beginning work is devoted to the principles of joining and to tool operations as involved in furniture making and interior finish, including design and construction, the proper use of tools, growth and strength of woods, shrinkage, warpage, and seasoning of timber, staining and polishing. Considerable attention is given to the making of working drawings of simple pieces of furniture which are built in the shops. A study of the steel square and its uses is taken up the second and the third years, and the practical use of the square

are given in brace and detailed roof construction. This work will be developed through the construction of parts of houses, barns, roofs, and bridges. In like manner, the construction of cornices, gutters, brackets, columns, window frames, and stairways is attempted. The erection of buildings in reduced scale and full sized sections of buildings is a strong feature of the course.

Supplementary lectures will be given upon the proper care of edged tools; the various woods used in building construction, their proper selection and treatment; the measurement of lumber, glues, nails, screws, bolts, nuts, pins, straps, and other fastenings. Roof trusses, spans and braces, and method of calculating their proper sizes; stair building, woodworking machinery, paints, shellacs, and varnishes; estimates and practice in working problems that are taken from the student's work, from trade journals and from actual plans and specifications of houses. These are some of the prominent features of the work.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

D-1. Carpentry and Cabinetmaking. Continuation of C-1; first year; second semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

C-2. Carpentry and Cabinetmaking. Continuation of D-1; second year; first semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

D-2. Carpentry and Cabinetmaking. Continuation of C-2; second year; second semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

C-3. Carpentry and Cabinetmaking. Continuation of D-2; third year; first semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

D-3. Carpentry and Cabinetmaking. Continuation of C-3; third year; second semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

E-1. Patternmaking. The purpose of this course is to teach the elements of machine patternmaking. The student begins his course with exercises involving the use of bench tools, and the reading of working drawings. These exercises emphasize the

necessity of draught, core prints, core boxes, of allowance for shrinkage of iron and other metals, and its effect on different shapes and thickness of castings. The student is taught how to join timber to prevent warpage and distortion of patterns by using segments, staves, ribs, etc. He is taught the meaning of trade names, such as boss, fillet, flange, rib, etc.; how to operate power machinery; to keep in repair belts and line shafting; to sharpen planer, and jointer knives, band saws; and how to select materials, such as glue, lumber, shellac, and fasteners.

Much of the constructive work is upon parts of machines that are being built in the College shops, such as pulleys, pipes, fittings, valves, gear wheels, dynamo frames, lathes, emery grinders, gas engines, and other machinery.

More advanced work includes the calculation, laying out, and construction of globe valves; spur, bevel, and worm gearing propeller blades and cams.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00. Text: Purfield: Wood Patternmaking.

F-1. Patternmaking. Continuation of E-1.

First year; second semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00. Text: Purfield: Wood Patternmaking.

E-2. Patternmaking. Continuation of F-1.

Second year; first semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

F-2. Patternmaking. Continuation of E-2.

Second year; second semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

E-3. Patternmaking. Continuation of F-2.

Third year; first semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

F-3. Patternmaking. Continuation of E-3.

Third year; second semester; 4 credits; 4 laboratory periods a week.

Fee: \$6.00. Deposit: \$2.00.

G. Woodworking. This is a course in woodworking, including instruction in the care and use of bench tools. The student becomes an adept in the use of the steel square by exercises in brace and rafter cutting and roof framing, followed by lectures on various types of barn constructions. The practical work involves the construction of models of roofs, trusses, buildings, and parts of buildings reduced in scale.

Vocational course in Agriculture; first year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

J-1. Course in Forging. The purpose of this course is to teach the principles of forging as applied in the average jobbing shop. It deals with the method of building fires so as to obtain best results in heating; care and operation of fires and forges; the use of tools in the working out of nuts, bolts, bending of eyes, forging staple, gate hooks; bending and welding of rings and links; making of hooks, clevises, and the parts of wagons and farm machinery; the forging of tools of high carbon steel and high speed steel such as chipping chisels, lathes, sharpeners, planers, and mill tools; blacksmith's and mechanic's hammers; knives, hatchets, draw knives, and other tools.

Special attention is given to the composition of iron and the various low and high speed carbon steels; and the treatment especially adapted for each grade, to annealing, tempering, and case hardening, with some lectures on the history and production of iron.

The student will have opportunity to get practical repair work on machinery brought in from the College farm—such work as plow sharpening, wagon and machine repairing. In fact, he will come in contact with most of the work that it done in an average jobbing shop.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

K-1. Course in Forging. Continuation of J-1; first year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

J-2. Course in Forging. Continuation of K-1; second year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

K-2. Course in Forging. Continuation of J-2; second year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

J-3. Course in Forging. Continuation of K-2; third year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

K-3. Course in Forging. Continuation of J-3; third year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

L. Blacksmithing. The student enters upon work having direct application to farming, such as the making and mending of farm implements, chains, clevises, and hooks; the ironing of whiffletrees and neck yokes; the repairing and sharpening of plows and other farm machinery. Short talks and demonstrations are given on the method of building fires so as to obtain the best results in heating, descriptions of fans and forges, the uses of tools for various forgings, and a study of the proper means of heating and treating materials to be used.

Vocational course in Agriculture; first year; second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00.

M-1. Course in Plumbing. The purpose of this course is to teach the students those things that will meet the needs of the average plumber. The work consists of instruction and practice in the care and handling of tools; in working with fittings, traps, valves, faucets, etc.; in working with sewer, soil, waste, water, and gas lines; in cutting and threading water pipe to measurements, using different fittings; in making fine and wiping solder, and in wiping upright joints; in laying out and constructing plumbing for buildings of two or more stories, including apartments and offices; in making range boiler and other hot-water connections; and in the practical uses of the soldering iron. The following subjects secure attention: joint wiping under varying conditions, sewer pipe laying, farm plumbing with the use of septic tanks, water supply systems, plumbing without the use of lead, sheet lead working, and estimating of plumbing construction.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

N-1. Course in Plumbing. Continuation of M-1.

First year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

M-2. Course in Plumbing. Continuation of N-1.

Second year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

N-2. Course in Plumbing. Continuation of M-2.

Second year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

M-3. Course in Plumbing. Continuation of N-2.

Third year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

N-3. Course in Plumbing. Continuation of M-3.

Third year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

P-1. Foundry. In the foundry course, the importance of foundry practice in the industrial trades is fully recognized. Modern practices and methods, as carried out in the best commercial foundries, are closely followed. The work is varied and is such as to keep students alive with interest and to tax their ability enough to make them think. The course comprises the following: definition and names of tools, characteristics of molding sands, use and care of tools and flasks. The first exercises are intended to familiarize the student with the proper molding condition of the sand and the correct use of the hammer and other tools. A variety of forms add interest to the work and present progressively the problems of joints, parting lines, follow boards, match plates, gates for molds, pouring basins and shrinkage gates. The patterns in general use are those for the numerous machine projects under development in the Industrial Arts department. Among other things, the student is given work germane to supporting copes, uses of gagers, and the use of solders and how to set them; facings such as sea coal, plumbago, talc, charcoal, and the preparation of facing mixtures; molding with good patterns broken castings, skeleton patterns; sweeps; molding of sheaves, pulleys, manhole covers, and rings; brackets; gas engine cylinders; lathe beds, in open sand and pit work, are emphasized. In core making are given materials of core making, core mixtures, uses of core boxes, sweeps, core arbors, and core rods, provisions for setting large cores by hand and with crane, methods of venting, core baking, and the painting of cores.

In cupola management the student becomes proficient in preparing the cupola, in charging and pouring off.

The work also includes practice in making castings in brass, bronze, and aluminum, and the making of alloys. Additional lectures are given on malleable castings, loam molding, steel founding, mixing and melting of iron, machine molding, and foundry appliances. The student is taught to keep account of the supplies and labor and be in a position to tell the cost of any article produced in the foundry, also the value of such articles as are turned out of commercial shops.

Vocational course; Mechanical Arts; first year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00. Text: International Correspondence School pamphlets.

Q-1. Foundry. Continuation of P-1.

First year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00. Text: International Correspondence School pamphlets.

P-2. Foundry. Continuation of Q-1.

Second year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

Q-2. Foundry. Continuation of P-2.

Second year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

P-3. Foundry. Continuation of Q-2.

Third year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

Q-3. Foundry. Continuation of P-3.

Third year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00.

T-1. Machine Shop Practice. For students who specialize in machine shop practice, there is work in chipping and filing straight and plane surfaces, filing two pieces to fit, and instruction in laying off and boring, followed by turning of various kinds of materials at different speeds and estimating of time and cost of work done by using different methods such as with and without gauges, gigs, etc., straight and taper turning, right and left hand thread cutting, single, double, square, and cutting of rack spur bevel and worm gears. There is instruction in the use and classification of gauges, micrometers, and calipers. The advantages of the uses of taps and dies, gigs, and special tools, are taken up; as are also the methods

of center squaring, straight and taper turning and fitting, outside and inside screw cutting, chucking and reaming, finishing and polishing, drill tap and mandrel grinding, tap boring, uses of milling machine; tool making, such as taps, reamers, mill cutters, and gauges.

Practical experience is acquired through the construction of machinery, such as lathes, gas engines, steam engines, emery grinders, and through general repair work of the College.

Time cards and stock of material are kept of all work, so that the matter of cost of production is given careful consideration.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00. Deposit: \$2.00. Text: Starrett's Hand-book.

U-1. Machine Shop Practice. Continuation of T-1.

First year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00. Deposit: \$2.00. Text: Starrett's Hand-book.

T-2. Machine Construction. Continuation of U-1.

Second year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00. Deposit: \$2.00.

U-2. Machine Construction. Continuation of T-2.

Second year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00. Deposit: \$2.00.

T-3. Tool and Gig Making. Continuation of U-2.

Third year; first semester; 4 credits; 4 laboratory periods.

Fee: \$6.00. Deposit: \$2.00.

U-3. Tool and Gig Making. Continuation of T-3.

Third year; second semester; 4 credits; 4 laboratory periods.

Fee: \$6.00. Deposit: \$2.00.

103. Manual Training. Designed to meet the needs of those students who desire to teach manual training in the sixth, seventh, eighth, and ninth grades of the public schools. A course in wood construction and design, including theory and practice in the proper use of tools; a study of the growth and structure of woods; shrinkage, warpage, and seasoning of timber; staining and finishing. Considerable attention is given to a study of shop methods, equipment, courses of study, and proper methods of conducting class work.

Course in Industrial Arts; freshman year; first semester; 3 credits; 3 laboratory periods.

Fee: \$4.50. Deposit: \$2.00. Text: Griffith: Essentials of Wood-work.

104. Manual Training. Continuation of 103; freshman year; second semester; 3 credits; 3 laboratory periods.

Fee: \$4.50. Deposit: \$2.00. Text: Griffith: Essentials of Woodwork.

105. Woodwork. This course, which is designed for Mining Engineering students, consists primarily of a series of constructive exercises in carpentry and joining, accompanied by lectures dealing with the care and use of bench tools; the use of the steel square in framing and laying out work.

After completing the first constructive exercises, the student will take up mine timbering, truss and bridge construction.

Mining Engineering; freshman year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

106. Woodwork. The purpose of this course is to give instruction in the care and use of modern woodwork benches and their equipment. Six lectures will be given in this course, each lecture followed by a practical application. Skill in the manipulation of tools cannot be obtained in this short time, but instruction and practice will be given in sharpening chisels, planes, and other edge tools; in jointing, setting, and filing handsaws.

The principal feature of this course will be the instruction and practice in the use of the steel square in brace work and rafter construction.

The course in Agriculture; freshman year; first or second semester; 1 credit; 1 laboratory period.

Fee: \$1.50. Deposit: \$2.00.

110. Woodwork. A course for Logging Engineering students, consisting of a series of constructive exercises in carpentry and joining, accompanied by lectures dealing with the care and use of bench tools, and the proper method of laying out work.

Logging Engineering course; freshman year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

111. Woodwork. A continuation of course 110 for Logging Engineering students. This course takes up the use of the steel square in building construction, and the design and construction of trestles, trussed roofs, and timber bridges.

Logging Engineering course; freshman year; second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

113. Woodwork. Correct use of the steel square in laying out practical carpenter work, windowsills and doorsills, bay and circular windows, steps, stairs, etc.; detailed construction of the window and door frames, sills, caps, weights, and fastenings in relation to the rough framework and the exterior and interior finish of the building are taken up.

In like manner, the construction of cornices, gutters, brackets, columns, and newel posts is taken up.

As soon as the students become familiar with the detailed construction of the above, they are assigned problems involving original design and construction.

Practice in reading plans, filling out material bills, and estimating the cost of material and labor, is a strong feature of the course.

So far as possible, drawings furnished by the architectural department are used in this work.

Ind. Arts and elective; freshman year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

116. Cabinetwork. This course consists of the designing and construction of furniture according to the ability of the individual student. Mixing of stains, fillers, and various finishes, with their application, is a strong feature of the course.

Included in the work is a study of the design and construction of drawers and panel work, and primary upholstery.

Elective; freshman year; second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

131. Patternmaking. This course consists of a series of exercises in planing and chiseling to familiarize the student with the proper use of tools; of practical exercises emphasizing the necessity of draught core prints, core boxes; of exercises showing the necessary allowance for shrinkage of iron and other metals, and its effect on different shapes and thicknesses of castings. Exercises in wood-turning are given in conjunction with lectures on the lathe, its care and management, and the care and use of turning tools. From the simple exercise the student soon advances to the construction of patterns of parts of machinery and other structures, such as pulleys, pipe fittings, valves, gear wheels, dynamo frames, gas and steam engines, lathes, emery grinders, and other pieces of machinery.

The lectures explain the correct methods of constructing the more complicated work, the principles of molding directly related to patternmaking, shrinkage of metals, kinds of lumber best suited for patternmaking, the working and twisting of woods, glue and metal fastenings, making cores and core boxes, methods of marking and storing patterns, estimating the weight of metal castings.

Course in Mechanical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00. Text: Purfield: Wood Patternmaking.

132. Patternmaking. This course and the following are a continuation of Patternmaking and are intended for engineering students who desire to devote further time to the subject, or for those who are engaged in the preparation of these, or construction work.

The work will consist largely in making patterns for steam and gas engines and other complicated machines.

Elective; first or second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

133. Patternmaking. This course is offered to students having had the equivalent of a two-credit course in patternmaking, and comprises the construction of the more complicated patterns and core boxes necessary for the building of steam and gas engines or other machine parts.

Elective; first or second semester; 1 credit; 1 laboratory period.

Fee: \$1.50. Deposit: \$2.00.

134. Patternmaking. Continuation of course 132.

Elective; second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

135. Wood Turning and Patternmaking. The principles of wood turning are taken up with reference to their application to the useful arts. This leads to patternmaking, which forms the greater part of the semester's work. One hour a week is used for shop lectures and recitations upon topics of vital importance to the work, such as selection of material, fastenings and joints, shrinkage of wood, allowance for shrinkage of metal, etc.

The course in Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods.

Fee: \$4.50. Deposit: \$2.00. Text: Purfield: Wood Patternmaking.

136. Patternmaking. This is a continuation of course 135, and is intended for those who desire to obtain a more detailed knowledge of the subject. The student has opportunity to enter more fully into constructive work in patternmaking, by making patterns and core boxes for parts of machines to be built in the College shops.

Elective; junior or senior year; first or second semester; 3 credits; 3 laboratory periods.

Fee: \$4.50. Deposit: \$2.00.

137. Woodwork. A general course consisting of a series of constructive exercises in simple cabinet making, accompanied by lectures on the care and use of bench tools and the use of the steel square in building construction and in some elementary patternmaking consisting of patterns emphasizing the necessity for draught, core prints, core boxes, and shrinkage. Exercises in wood turning will be given in conjunction with the lathe, its care and management, and the care and use of wood-turning tools.

Course in Electrical Engineering; first or second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

151. Blacksmithing. The student is taught to make and manage the forge fire; to shape iron by bending, upsetting, drawing, and welding. Many useful articles are made, consisting of hooks, staples, rings, clevises, and chains.

Logging Engineering, Mechanical Engineering, and Electrical Engineering; sophomore year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00.

152. Toolmaking and Tempering. This course is devoted to the study of the heat treatment of steel as exemplified in making and tempering tools, springs, and other articles of steel.

Prerequisite: Course 151.

The course in Mechanical Engineering; sophomore year; second semester; 1 credit; 1 laboratory period.

The course in Logging Engineering; sophomore year; second semester; 1 credit; 1 laboratory period.

Fee: \$1.50.

153. Blacksmithing. A course for students in Agriculture. After completing the first exercise, the student enters upon work having direct application to farming, such as the mending of farm

implements, making and mending of chains, clevises, and hooks; ironing of whiffletrees and neckyokes; sharpening of tools.

Agricultural course; sophomore year; first semester; 1 credit; 1 laboratory period.

Fee: \$1.50.

154. Blacksmithing. A continuation of course 152, for students wishing to take an entire year of blacksmithing.

Elective; sophomore year; second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00.

155. Forging. This course deals with the equipment of the blacksmith shop, and includes exercises in bending, shaping, upsetting, and welding iron. Some instruction is given also in hardening and tempering steel, and in brazing. The course is accompanied with lectures on the management of the fire, methods of construction, and shop equipment.

The course in Industrial Arts; junior year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00.

156. Hammered Metal Work. This course consists of hand wrought metal and enamel work, including hard and soft soldering, the formation of bowls, trays, boxes, lamp shades. The design and construction of furniture fittings.

The course in Industrial Arts; junior year; second semester; 2 credits; 2 laboratory periods.

158. Forging and Tool Dressing. After the minimum amount of preliminary work in forging iron, the remainder of the time is devoted to making, tempering, and dressing chisels, drills, and other steel tools.

The course in Mining Engineering; freshman year; second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00.

171. Foundry Practice. This course includes a study of the foundry equipment; care and management of cupolas; mixing and melting of iron; molding in green and dry sand; preparation of cores; casting in iron and brass.

The course in Mechanical Engineering; freshman year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Text: International Correspondence School pamphlets.

173. Foundry Practice. A course in all respects equivalent to course 171.

The course in Electrical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Text: International Correspondence School pamphlets.

174. Foundry Practice. More comprehensive than course 171.

Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods.

Fee: \$4.50.

175. Advanced Foundry Practice. Continuation of 171 and 173.

Elective; 2 credits; 3 laboratory periods.

Fee: \$3.00.

202. Machine Shop. The work in the machine shop includes both bench and machine work. Upon first entering the shop the student is taught the principles of chipping, filing, and hand finishing. This occupies the first half of the semester. Machine work is then taken up through a series of exercises on lathe, shaper, planer, drill press, and milling machine. One hour of the student's time is required each week in the class room to attend lectures, work problems, or prepare other work assigned by the instructor.

The courses in Mechanical and Logging Engineering; sophomore year; second semester; 1 credit; 1 laboratory period.

Fee: \$1.50. Deposit: \$2.00. Text: Halsey: Machine Shop Methods.

203. Machine Shop. A continuation of course 202 devoted to machine construction and milling machine work. Special attention is paid to economical shop methods of doing work.

The course in Mechanical Engineering; junior year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00. Text: Halsey: Machine Shop Methods.

205. Machine Shop. This and the following courses are a continuation of 203.

Mechanical Engineering course; second semester; 3 credits; 3 laboratory periods.

Fee: \$4.50. Deposit: \$2.00.

206. Machine Shop. A course similar to course 202, designed to meet the requirements of students in Electrical Engineering.

The course in Electrical Engineering; sophomore year; second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00. Text: Halsey: Machine Shop Methods.

207. Machine Shop. Continuation of 206.

Elective; Electrical Engineering students; junior year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00. Text: Halsey: Machine Shop Methods.

208. Machine Shop. This course begins with the hand processes of chiseling, filing, and polishing, which are followed by a detailed study of the lathe, drill press, planer, and shaper, taught by means of carefully planned exercises. The course includes one hour a week of lecture or recitation work to supplement the instruction given in the shop.

The course in Industrial Arts; senior year; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00. Text: Halsey: Machine Shop Methods.

209. Machine Shop. A continuation of course 208 in which the student becomes familiar with the more complicated machines such as turret lathes, and milling machines. Shop methods are studied with reference to economical production. The student, as far as possible, enters upon construction of machinery and apparatus for College equipment.

The course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00. Text: Halsey: Machine Shop Methods.

212. Machine Shop. Similar to 202.

Elective; first semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

213. Machine Shop. Continuation of 212.

Elective; second semester; 2 credits; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

228. Dairy Mechanics. This course is arranged for the students of Dairy Manufactures. An attempt is made to give in a brief way through lectures and laboratory work, a knowledge of plumbing, setting of line shafting, and the operation and repair of machinery, electric wiring, and the operation of electrical ma-

chinery. This work is given by instructors in the plumbing and machine shops, and in the electrical laboratory.

Dairy Manufactures; senior or junior year; second semester; 1 credit; 1 laboratory period.

Fee: \$3.00.

231. Manual Training for Elementary Grades. This course deals with the design and construction of cardboard work, weaving, basket and mat work, stencil cutting, bookbinding, and other industrial subjects such as are taught in the first six grammar grades.

Prerequisite or parallel: Course 171 Industrial Education.

Course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods.

270. Plumbing. Course similar to M-1.

Elective; 2 credits; 2 laboratory periods; first and second semesters.

Fee: \$3.00.

301. Shop Drawing. This course is intended for those students who are specializing in Industrial Arts. In the beginning the work is devoted to the learning of the elements of drawing, the general use of the drawing instruments, lettering general constructions, methods of representation and free-hand sketching. Considerable attention will be given to drawings of pieces of furniture and constructions in wood that may be worked out in the shops.

Course in Industrial Arts; first semester; 2 credits; 2 laboratory periods.

302. Shop Drawing. Continuation of 301.

Second semester; 2 credits; 2 laboratory periods.

MECHANIC ARTS

This is a vocational course extending through three years, during which the student devotes at least one-third of his time to shop work and trade drawing. English, mathematics, chemistry, physics, and elementary economics are also included in order to balance the course and give it educational value.

The student is permitted to specialize in the vocational work according to his individual preferences and qualifications. The choice of work includes Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

This is not to be regarded as a preparatory course for the degree courses in engineering. Such preparation can best be obtained in the regular accredited high schools of the State. Neither is it intended that this course shall entice students away from the high schools, but that it shall fill a need not generally provided for by the secondary schools of the State.

It is the purpose of this course to assist those who expect to make their way in the world by their manual skill in various lines of activity—those who feel that they cannot afford to take a degree course in college, but desire to get some vocational training in special lines, and at the same time secure the broadening influence of education in English, mathematics, and elementary science. While it is not the primary aim to train foremen and superintendents, it is believed that students after completing the course and gaining a few years of practical experience will be able to hold positions of responsibility, or to go into business for themselves.

The shops are equipped with the latest approved machinery and are well suited to carry on these practical courses.

This work is open to students who have completed the eighth grade, or equivalent, of the common schools, and who are sixteen years of age. Those who complete the three years of work and take all of the work outlined will be entitled to a diploma. In order to secure a diploma in Patternmaking, Carpentry and Cabinetmaking, Machine Shop Practice, or Plumbing, at least two years must be devoted to the desired subject. The other year may be devoted to selected courses subject to the approval of the head of the department. A general shop course may be taken by combining one year of Machine Shop, one year of Blacksmithing, and one year of Foundry Work; or one year of Woodworking, one year of Foundry, and one year of Machine Shop.

VOCATIONAL COURSE IN MECHANIC ARTS

	First Year	Semest.r	
		1st	2nd
Vocational English (Eng. G, H)		3	3
Algebra (Math. A, B)		5	5
Elementary Commercial Geography (Com. H)		2	
Elementary Industrial History (Com. K)			2
Vocational Drawing (M. E. A-1, B-1)		2	2
*Shop Work (According to trade selected)		4	4
Drill (Military, A, B)		1	1
Gymnasium (Phys. Ed. 11, 12)		1½	½
		17½	17½
Second Year			
Advanced Vocational English (Eng. I, J)		3	3
Shop Arithmetic (Math. O)		4	
Plane Geometry (Math. L)			4
Trade Drawing (M. E. A-2, B-2)		2	2
Chemistry (Chem. A, B)		3	3
*Shop Work (According to trade selected)		4	4
Drill (Military C, D)		1	1
Gymnasium Phys. Ed. 13, 14)		½	½
		17½	17½
Third Year			
Geometry and Trigonometry (Math. T)		4	
Elementary Industrial Problems (Com. J)			3
Commercial Law (Com. L)		2	
Shop Accounting (Com. F)			2
Trade Drawing (M. E. A-3, B-3)		2	2
Physics (Phys. A, B)		3	3
*Shop Work (According to trade selected)		4	4
Drill (Military E, F)		1	1
Electives		2	2
		18	17

*Shop Work. The student will choose the general line of shop work which he desires to pursue from the following: Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

IRRIGATION ENGINEERING

THOMAS ANDERSON HENDRICKS TEETER, Professor

Successful agriculture in the arid parts of Oregon is based on the science of irrigation. The widespread development of irrigation lands in this and other states of the arid west, by means of both gravity supplies and pumping systems, has extended the necessary qualifications of the engineer to include a knowledge of irrigation methods, pumping, and power machinery. The province of the engineer, therefore, comprises the development, conservation, and economical use of limited water supplies. The failure of our irrigation projects is almost invariably caused by the employment of incompetent engineers and managers. In recognition of the need, in the Pacific Northwest, for Engineers trained in irrigation and hydraulics, the course in Irrigation Engineering has been established.

Realizing, however, that the young engineer is frequently obliged to take charge of work which properly falls outside of the field in which he has specialized, the course in Irrigation Engineering is arranged to cover as broad a field as practicable, in order that the graduate may experience little difficulty in accommodating himself to the available positions. The curriculum in this department has for its purpose, in the freshman and sophomore years, the laying of a foundation on which to build the more specialized and technical work of the junior and senior years. The last two years are intended to equip the student with a well-rounded knowledge of hydraulics and irrigation engineering—a knowledge which will enable the student to hold a responsible position in reclamation work.

The work of this department is designed to furnish a thorough course of theoretical instruction accompanied by practice in the various lines of irrigation engineering. The course, moreover, is made practical by a large proportion of laboratory and field practice in conjunction with the theoretical work. Special stress is laid on the solution of problems, and experiments in the laboratory. Emphasis is laid on skill in handling surveying and water-measuring instruments. The student is taught how to make stream measurements; design, lay out, and construct dams, canals, headworks, diversion weirs, flumes, pipe lines, and distributing systems.

Inspection trips are conducted in the junior and senior years to afford the students an opportunity to familiarize themselves with actual engineering work.

Electives. Ample opportunity is given the student to elect courses outside of the School of Engineering. This provision is made that the student may be encouraged to study Economics, Political Science, Accounting, English, and Modern Languages, a knowledge of each of which is helpful, if not essential, in the engineering profession. In addition, the School of Agriculture offers to the student of irrigation engineering, special courses in forage crops, as well as climatology, farm drainage, soil physics and their relations to the growth of crops on irrigated lands.

Equipment. The excellent equipment of the Civil, Highway, and Experimental departments, as described under these respective titles, is available for use by the students in Irrigation Engineering. Besides the draughting rooms and laboratories, the student has the use of transits, levels, plane-tables, current meters, and tapes, for practical work, as well as pumps, water meters, rams, and small water wheels of the Experimental Engineering laboratories for experimental work. Facilities for experiments with small weirs, orifices, and devices for measuring irrigation water are provided.

In addition to the above facilities, the proximity of the Willamette and Mary's rivers, Oak Creek, and the mill race of the Corvallis Flouring Mills, affords excellent opportunities for practice in stream gauging. For those students who desire to prepare themselves for positions as managers of irrigation projects, the elective courses in Irrigation and Drainage will give access to the equipment of that department.

DEGREE COURSE IN IRRIGATION ENGINEERING Semester

Freshman Year		1st	2nd
Trigonometry, College Algebra (Math. 11, 21).....	5		
Elementary Analysis (Math. 31).....			5
General Chemistry (Chem 100, 101).....	3	3	
Mechanical Drawing (C. E. 107).....	3		
Engineering Drawing (C. E. 111)			3
Descriptive Geometry (M. E. 152).....	3		
Library Practice (Libr. 1)	1½		
Hygiene (Phys. Ed. 10).....	1½		
Plane Surveying (C. E. 222)			5
Drill (Military 1, 2,)	1	1	
Gymnasium (Phys. Ed. 15, 16)	1½	1½	
Spherical Trigonometry (Math. 25)	1		
		17½	17½

	Semester	
	1st	2nd
Sophomore Year.		
Differential Calculus, Integral Calculus (Math. 51, 52)....	4	4
Engineering Physics (Physics 101, 102).....	4	4
Topographic Surveying (C. E. 223).....	5	
Railroad and Canal Surveying (C. E. 272)		5
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
Electives (Restricted)	3	3
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Junior Year.		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Roads and Pavements (C. E. 405).....	3	
Graphic Statics (C. E. 511)	2	
Hydraulics (I. E. 102)		3
Cement and Highway Laboratory (Exp. E. 231).....	2	
Structural Materials Laboratory (Exp. E. 232).....		3
Masonry and Foundations (C. E. 552)		3
Military Science (Theo. Inst. 1, 2)	1	1
Drill (Military 5, 6)	1	1
Electives (Restricted)	3	3
	<hr/>	<hr/>
	17	17
Senior Year.		
Engineering Seminar (C. E. 605, 606)	1	1
Reinforced Concrete (C. E. 557)	4	
Contracts and Specifications (C. E. 607)		2
Hydrology (I. E. 303)	1	
Water Supply (I. E. 305)	3	
Irrigation Engineering (I. E. 401)	2	
Design of Irrigation Structures (I. E. 402)		2
Hydraulics Laboratory (Exp. E. 262)		2
Hydraulic Pumps and Motors (I. E. 201)	2	
Soil Physics (Agron. 103)		3
Irrigation Farming (Agron. 302)		3
Water Law (I. E. 601)	1	
Electives (Approved)	2	3
	<hr/>	<hr/>
	16	16

The following is a list of approved electives from which the student must choose, as indicated above, two or three credit hours each semester in those years in which elective courses are offered. Unless the student has credit for at least three credit hours of modern languages, he will not be permitted to register for less than twelve credits of any modern language course. Unless satisfactory credits are produced, no student will be permitted to register for less than six credits of economics, when such electives are chosen.

	Semester	
	1st	2nd
Sophomore and Junior Years.		
Modern English Prose (Eng. 81, 82)	3	3
French, German or Spanish (Mod. Lang. 101, 102, 103, 104, 201, 202, 203, 204, 301, 302, 304)	3	3
Commercial Geography (Com. 202)	3	
Principles of Economics (Com. 212)		3
General Accounting, Special Accounting (Com. 107, 108) ..	2	3
Senior Year.		
Forage Crops (Agron. 203)	2	
Land Drainage (Agron. 301)		3
Highway Bridges (C. E. 513, 514)	4	4
Water Power (I. E. 204)		3
Electrical Machinery (E. E. 403)	3	
Electric Machine Drives (E. E. 410)		2
Advanced Materials Laboratory (Exp. E. 235)		2
Climatology (Agron. 303)		1
Irrigation Farming (Agron. 306)	2	
Drainage Engineering (I. E. 501)	2	2

The following courses are offered:

101. Hydraulics. A practical application of the principles of hydraulics to irrigation farming, arranged especially for agricultural students. A study of the laws of water pressure in tanks, pipes, and flumes; the measurement of water by weirs, orifices, and current meters; the study of losses of head in pipes and the consequent effect on the discharge. The design of open channels; seepage losses; the operation of rams, pumps, and scoop wheels.

Elective for seniors in Agriculture; senior year; first semester; 2 credits; 2 lectures.

This course can be taken only in conjunction with Exp. Eng. 265, a 1-credit laboratory course, covering the same field.

Text: Merriman: Elements of Hydraulics.

102. Hydraulics. A technical course dealing with the elementary laws of liquids in motion and at rest; the weight and pressure of water on gates and dams; velocity and discharge through orifices, tubes, pipes, and flumes; fluid friction, losses of head, and time of emptying reservoirs.

Prerequisite: M. E. 251.

Required of juniors in Highway, Irrigation, Electrical, and Mining Engineering; junior year; second semester; 3 credits; 3 lecture periods.

Text: Russell: Text-book on Hydraulics.

201. Hydraulic Pumps and Motors. The application of the principles of hydraulics to the design, construction, and operation of pumps and water wheels; the various forms of wheels and pumps, their adaptability, and efficiency.

Prerequisite: Hydraulics, I. E. 102.

Required of seniors in Irrigation Engineering; senior year; first semester; 2 credits; 2 lecture periods.

204. Water Power. A general study of the development of water power on streams; the effect of pondage, storage, and load factor on the capacity and efficiency of the plant and equipment; a detailed study of the characteristics of modern water turbines, together with an investigation of the speed regulation and manner of governing large plants. Practical problems in the design of plants will constitute a part of this course.

Prerequisite: Water Supply Engineering, I. E. 305 or Irrigation Engineering I. E. 401.

Elective for seniors or graduates in Irrigation Engineering; senior year; second semester; 3 credits; 3 lecture periods.

Fee: \$1.00. Text: Meade: Water Power Engineering.

303. Hydrology. A recitation and problem course dealing with the character of drainage basins; relations between rainfall and runoff; estimating flow from watersheds; variations in seasonal discharge, a study of current meters, and other instruments and methods for determining stream flow; the hydrograph and its use; the duration curve; the ripple curves and their relations to power and storage studies.

Prerequisite: I. E. 101 or 103.

Required of seniors in Irrigation Engineering; elective for Agronomy students, senior year; first semester; 1 credit; 1 recitation.

Text: Hoyt & Grover: River Discharge.

305. Water Supply Engineering. Preliminary investigations for determining the available supply of water for irrigation and domestic purposes; the use of the mass diagram in the study of storage; ground water resources; the source of water supplies; manner of conveying and storing water; requirements for fire protection; the economics of pumping and the proper installation of pumping plants. The solution of numerical problems is required of the student.

Prerequisites: C. E. 511, I. E. 102.

Required of seniors in Irrigation Engineering senior year; first semester; 3 credits; 2 lecture periods; 1 laboratory period.

Fee: \$1.00. Text: Turneure & Russell: Water Supply Engineering.

401. Irrigation Engineering. Investigations and surveys; the operation and maintenance of large irrigation projects from the engineer's point of view; precipitation, run-off, underground flow, fluctuation of stream flow; storage; methods of determining losses due to evaporation and seepage; canal linings; the phenomena of water logging and alkali deposits; drainage; the duty of water; irrigation by pumps; the location and construction of irrigation systems; diversion weirs, headgates, flumes and drops; the theory and practice of water measurements, water records, methods practiced in other countries.

Prerequisite: I. E. 102.

Required of seniors in Irrigation Engineering; senior year; first semester; 2 credits; 2 lecture periods.

Text: Etcheverry: Irrigation Structures, Vol. III.

402. Design of Irrigation Structures. This course deals with the storage and conveyance of water; the design of headworks and flumes; the selection of dam sites; investigations of the stability of dams in use; the design of a dam by Wegman's method; the design of pipe lines, earthen dams, and reservoirs; the design of flash boards and movable dams, hollow dams, and their application to storage and pondage. This course consists entirely of numerical problems with occasional lectures on the solution of the same.

Prerequisites: C. E. 511, I. E. 401, and I. E. 102.

Required of seniors in Irrigation Engineering; senior year; second semester; 2 credits; 2 three-hour laboratory periods.

Fee: \$1.00.

501. Drainage Engineering. Surveys for, and design of, large drainage systems; open ditch construction, dredging and cleaning of large drainage channels; methods of computing sizes of tile drains; plans, reports and records; estimates of costs; preparation and enforcement of specifications; division of costs; inspection of drain tile.

Prerequisite: I. E. 102.

Elective for seniors in Highway and Irrigation Engineering; senior year; 2 credits; 2 lecture periods to be arranged.

Fee: \$1.00. Text: Parsons: Drainage Engineering.

602. Water Law. A study of riparian rights; the early development of the water laws of the arid regions; doctrine of appropriation; beneficial use; comparison of California and Colorado doctrines; rights of appropriations; law of storage and diversion; rights of way; relation of water law and land law; relation of water to land appurtenant; prescription; abandonment; federal water laws; state control; water laws of Oregon; adjudication; irrigation and drainage district law; duties of state engineer; a brief comparison of Canadian and foreign water laws.

Text: Davis: The Law of Irrigation.

701. Sanitary Engineering. Drainage systems of populous districts, including chemical and bacterial purification of sewage; collection and disposal of garbage; street cleaning; separate and combined water carriage systems; surveys, plans, and specifications; law of flow and determination of size and capacity; brick, terracotta, cement, and concrete sewers.

Prerequisite: I. E. 102.

Senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.00. Text: Folwell: Sewerage.

802. Hydrography and Navigation. This consists of a brief study of the figure of the earth and the celestial sphere, followed by methods of determining latitude, longitude, time, and azimuth from the sun and stars; the location of soundings, maritime charting and mapping; and the fundamentals of navigation. Numerical problems are assigned to supplement the field work.

Prerequisites: C. E. 222-223, and Spherical Trigonometry.

Elective for juniors and seniors; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.00.

MECHANICAL ENGINEERING

GRANT ADELBERT COVELL, Professor
MARK CLYDE PHILLIPS, Associate Professor
FAY HARRY ROSENCRANTS, Assistant Professor
JOSEPH BENJAMIN YODER, Instructor

The course in Mechanical Engineering has for its purpose the preparation of young men for positions of usefulness and responsibility in the industrial life of the country.

The Pacific Northwest is just now entering upon a period of rapid progress in the building of railroads, the development of water power, the marketing of forest products, and the upbuilding of manufactories, all of which require men conversant with the general principles of engineering. It is the purpose of all engineering courses to contribute to this general advancement, by turning out graduates equipped with the necessary knowledge and skill to make them active factors in this great work.

It is the general plan of the course in Mechanical Engineering to lay a broad foundation in English, Mathematics, Chemistry, and Physics, accompanied by Drawing and Shopwork, during the first two years of the course. The work of the last two years is more technical and professional in its nature, consisting in a study of the principles involved in the development of power by steam engines, water wheels, gas and gasoline engines, and steam turbines. It also involves a critical study of the design of machines and materials entering into their construction, as well as tests to determine their efficiency.

Instruction is given by means of lectures, recitations, and laboratory exercises. The scientific principles involved in machines and mechanical movements to the solution of problems in mechanical engineering. In the shops, the student learns the use of tools and the value of different methods of doing work from the standpoint of economical construction. In the draughting room, he learns to make working drawings and blueprints of machines, and to formulate designs of his own.

With these advantages to aid him, the ambitious student should be able to take and maintain a position in the general industrial and engineering development which is the leading and characteristic feature of the age in which we live.

Equipment. The laboratory equipment for this department in mechanics and power measurement, is described under Experi-

mental Engineering. The shops are under the supervision of the department of Industrial Arts.

In addition to equipment listed under these two departments, there are two large draughting rooms, each with 40 drawing tables, drawing boards for each student, and a blue-print room, with printing frame, wash trays, etc.

DEGREE COURSE IN MECHANICAL ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (English 81, 82)*	3	3
Trigonometry, College Algebra (Math. 11, 21)	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem. 100, 101)	3	3
Mechanical Drawing (M. E. 151)	2	
Descriptive Geometry (M. E. 152)		3
Foundry (Ind. Arts 171)	2	
Patternmaking (Ind. Arts 131)		2
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Sophomore Year		
Differential and Integral Calculus (Math. 51, 52)	4	4
Engineering Physics (Physics 101, 102)	4	4
Mechanical Drawing (M. E. 153)	3	
Mechanism (M. E. 204)		3
Commercial Geography (Com. 200)*	3	
Principles of Economics (Com. 210)*		3
Blacksmithing (Ind. Arts 151)	2	
Toolmaking and Tempering (Ind. Arts 152)		1
Machine Shop (Ind. Arts 202)		1
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

*Upon approval of the Dean, students may substitute a Modern Language for English in the freshman year and for Commercial Geography and the Principles of Economics in the sophomore year.

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Theory and Practice of Steam Engineering (M. E. 305) ..	3	
Advanced Steam Engineering (M. E. 306)		3
Applied Mechanics Laboratory (Exp. E. 201)	3	
Power and Hydraulic Laboratory (Exp. E. 202)		3
Graphic Statics (C. E. 511)	2	
Machine Shop (Ind. Arts 203, 205)	2	3
Military Science (Theo. Inst. 1, 2)	1	1
Drill (Military 5, 6)	1	1
Hydraulics (I. E. 102)		3
	17	17
Senior Year		
Machine Design (M. E. 205, 206)	4	3
Steam Boilers (M. E. 309)	2	
Electrical Machinery (E. E. 403)	3	
Steam Power Plant Design (M. E. 316)		3
Advanced Mechanics Laboratory (Exp. E. 203)	3	
Advanced Power Laboratory (Exp. E. 204)		3
Gas Engine Laboratory (Exp. E. 272)		2
Internal Combustion Motors (M. E. 346)		2
Heating and Ventilating (M. E. 331)	3	
Seminar (M. E. 351, 352)	1	1
Elective		2
	16	16

The following courses are offered:

A-1. Vocational Drawing. Similar to M. E. 151 except more stress is laid on the elementary principles, as the course is designed for students who have had no high-school training in drawing.

Vocational course; Mechanic Arts; first year; first semester; 2 credits; 2 laboratory periods.

B-1. Vocational Drawing. A continuation of A-1.

Vocational course; Mechanic Arts; first year; second semester; 2 credits; two laboratory periods.

*Upon approval of the Dean, students may substitute a Modern Language for English in the freshman year and for Commercial Geography and the Principles of Economics in the sophomore year.

A-2. Vocational Drawing. Continuation of B-1. As the student becomes competent he is given practical machine drafting on work through the Shops, similar to that of M. E. 153.

First semester; 2 credits; 2 laboratory periods.

B-2. Vocational Drawing. Continuation of A-2.

Second year; second semester; 2 credits; 2 laboratory periods.

A-3. Vocational Drawing. Continuation of B-2.

Third year; first semester; 2 credits; 2 laboratory periods.

B-3. Vocational Drawing. Continuation of A-3.

Third year; second semester; 2 credits; 2 laboratory periods.

151. Mechanical Drawing. The use of instruments and elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, principles of orthographic projection, etc., supplemented by recitations and lectures from a standard text.

As soon as practicable the copy sheets are discontinued and the student is required to make sketches and working drawings of typical machine details, such as pulleys, fly wheels, crank shafts, pump details, etc., from actual machines available in shops and drawing room. In addition, a special drill in free-hand lettering is given at the beginning of each period throughout the course.

Electrical Engineering, Mechanical Engineering; freshman year; Logging Engineering, sophomore year; first semester; 2 credits; 2 laboratory periods.

Text: French: Engineering Drawing.

152. Descriptive Geometry. This course consists of the graphic solution of problems involving the projection of lines, surfaces, and solids. Special effort is made to make the work as practical as possible and to make clear the application of Descriptive Geometry to actual drafting-room problems.

Electrical Engineering, Mechanical Engineering, Mining Engineering; freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

Text: Ferris: Elements of Descriptive Geometry.

153. Mechanical Drawing. A continuation of course 151 and includes laying out of gear-teeth curves and conventional methods of representing different kinds of gears. Exercises in structural-steel drafting are also given, as well as sheet-metal layouts of a large variety of intersections, joints, etc., from principles learned in Descriptive Geometry. The remainder of the semester is de-

voted to practical machine drafting of machines and apparatus to be built in the College Shops. All articles built in the Shops are first detailed in the drawing room by the students from sketches and other data, and blueprints sent to pattern and machine shops. A number of standard sizes and a standard title are used, and every effort is made to have the work conform as closely as possible to good drafting-room practice.

Electrical Engineering and Mechanical Engineering; sophomore year; first semester; 3 credits; 3 laboratory periods.

Text: French: Engineering Drawing.

204. Mechanism. A study of mechanical movements, including velocity ratios; transmission of motion by linkwork, gearing, cams, and belting.

The course in Electrical and Mechanical Engineering; sophomore year; second semester; 3 credits; 2 recitations; 2 two-hour laboratory periods.

The course in Logging Engineering, junior year; second semester; 3 credits; 2 recitations; 2 two-hour laboratory periods.

Text: Keown: Elements of Mechanism.

205. Machine Design. This course consists largely in applying the principles discussed in mechanism and in mechanics to the design of machine parts. The work includes among other things the study of screws, fastenings, shafting, belting, fly wheels, wheels, gearing, and machine frames.

Senior year; first semester; 4 credits; 4 recitations.

Text: Kimball & Barr: Machine Designs.

206. Machine Design. This course supplements and is directly dependent upon the recitation work of course 125.

The work is taken up from a practical point of view and applies such theory as is consistent with the approved methods of design. Designs and complete working drawings are made of machines.

Senior year; second semester; 3 credits; 3 laboratory periods.

Text: Kimball & Barr: Machine Designs.

207. Machine Drawing and Design. A course in mechanical drawing involving the elementary principles of machine design.

Industrial Arts course; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

251. Statics and Dynamics. This is essentially a course in theoretical and applied mechanics. Force systems are analyzed and their effects upon rigid bodies, both at rest and in motion, are

carefully studied. Methods of finding centers of gravity and moments of inertia are investigated, and their practical application is brought to the student's attention by solving a number of problems. The principles of work, energy, friction, and impact, are all studied with reference to their importance in the field of engineering.

Prerequisites: Differential and Integral Calculus, Math. 51, 52.

All courses in Engineering; junior year; first semester; 5 credits; 5 recitations.

Text: Hancock: Applied Mechanics for Engineers.

252. Strength of Materials. In this course the general principles of mechanics are applied to the elements of engineering structures to determine their strength and fitness.

Some of the features are tensile and crushing strength of different engineering materials; strength and stiffness of beams or girders under different systems of loading, and various methods of support; supporting power of posts or columns; the application of torsion to shafts as a means of transmitting power.

The work throughout is exemplified by numerous problems which the student is required to solve.

Prerequisite: Statics and Dynamics, M. E. 251.

All courses in Engineering; junior year; second semester; 3 credits; 3 recitations.

Text: Boyd: Strength of Materials.

302. Road Machinery. This course is designed to familiarize the student with the purpose, care, and manipulation of the different forms of power-driven road machinery, both steam and gas, as exemplified in modern road construction.

The course in Highway Engineering; senior year; first semester; 1 credit; 1 laboratory period.

303. Elementary Steam Engineering. This course deals with the principles of steam engineering in a very elementary manner. Its purpose is to familiarize the student with the type of steam machinery largely used in the logging industry, such as donkey engines, logging locomotives, etc. This course is supplemented by course 255 in Experimental Engineering which must be taken in conjunction.

Course in Logging Engineering; junior year; first semester; 2 credits; 2 recitations.

Text: Allen & Bursley: Heat Engines.

305. Theory and Practice of Steam Engineering. This course includes a study of the elementary thermodynamic laws of gases and vapors with reference to their application to engineering practice, and aims to fulfill the essential thermodynamic requirements of the gas and steam engineer. The work will be supplemented throughout with problems.

Prerequisites: Differential and Integral Calculus, Math. 51, 52.

The course in Mechanical Engineering; junior year; first semester; 3 credits; 3 recitations.

Text: Heck: Steam Engines and Turbines.

306. Advanced Steam Engineering. A continuation of course 305, in which more time is spent on the application of the principles of thermodynamics to power plant machinery and to a study of the interrelation of power plant apparatus, including steam prime movers and boilers and their auxiliaries.

The courses in Mechanical and Electrical Engineering; senior year; either semester; 3 credits; 3 recitations.

Text: Heck: Steam Engines and Turbines.

307. Steam Machinery. This course covers in an elementary way the thermodynamics of gases, the principles of combustion and steam generation, and in general the application of heat to the production of mechanical power. The mechanical construction of the machinery essential to the process of power generation, such as the steam engine, the steam turbine, the gas engine, and the steam boiler, is also briefly discussed.

The course in Electrical Engineering; junior year; first semester; 3 credits; 3 recitations.

Text: Allen & Bursley: Heat Engines.

309. Steam Boilers. A study of the construction and operation of steam boilers, superheaters, economizers, heaters, boiler feeding devices, oil burning devices, and chimneys. It is the aim of this course to familiarize the student with modern methods and apparatus involved in the economic generation of steam.

Prerequisite: Course 305.

The course in Mechanical Engineering; senior year; first semester; 2 credits; 2 recitations.

Text: Notes.

312. Steam Turbines. The steam turbine has taken its place as one of the important factors in transforming energy into work. Hence the principles involved in its construction and operation

should be well understood by engineering students. This course considers the flow of steam through pipes and nozzles and its action on turbine buckets. The effects of superheating are noted and some attention is given to steam turbine design.

Elective; senior year; second semester; 2 credits; 2 recitations.

Text: Roe: Steam Turbines.

316. Steam Power Plant Design. The work in this course includes the design and working drawings of steam power-plant problems. Among other things considered, are the location of plants; the selection of engines, boilers, pumps, and heaters; the general arrangement of parts, including the connections, piping, and auxiliaries.

The course in Mechanical Engineering; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

Fee: \$0.75. Text: Gebhardt: Steam Power Plant Engineering.

325. Compressed Air and Refrigeration. A course devoted to the theory, design, and operation of air compressors, fans, and blowers, the first part of the semester, and to the study of the theory and operation of commercial refrigeration systems the latter part.

Prerequisite: M. E. 305.

Elective in the senior year of the Mechanical and Electrical Engineering courses; first semester; 2 credits; 2 recitations.

Text: Thorkelson: Air Compression and Transmission.

331. Heating and Ventilating. Study of modern methods for the heating and ventilating of buildings. An outline of the work includes a study of several approved systems of heating by means of steam, hot water, or air; methods of computing radiating surface; effective methods of ventilation; general design, construction, and operation of plant.

The course in Mechanical Engineering; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

Text: Hoffman: Heating and Ventilation.

346. Internal Combustion Motors. In this course the application of thermodynamics to the internal combustion engine cycles, is studied with reference to the economy of operation. The theory of the combustion of gases and of the gasification of the liquid and solid fuels commonly met with in internal combustion engine practice, is discussed. The remainder of the time is devoted to a study of details, auxiliaries, and operation.

Prerequisites: M. E. 305, 306.

Courses in Mechanical Engineering; senior year; second semester; 2 credits; 2 recitations.

Text: Streeter: Internal Combustion Motors.

351. Seminar. The seminar meets once each week to study progress and development in the field of mechanical engineering. Technical literature will be reviewed; assignments will be made in advance, covering new or special features of engineering work. Students are required to submit carefully prepared reports, criticisms, or comments.

The course in Mechanical Engineering; senior year; first semester; 1 credit; 1 recitation.

352. Seminar. A continuation of course 351.

The course in Mechanical Engineering; senior year; second semester; 1 credit; 1 recitation.

SCHOOL OF FORESTRY

GEORGE WILCOX PEAVY, Dean.
HAROLD STEPHENSON NEWINS, Assistant Professor
CHARLES JUNIUS CONOVER, Instructor

NON-RESIDENT LECTURERS.

E. T. ALLEN, Western Forestry and Conservation Association
J. D. YOUNG, Inman-Poulsen Lumber Company
E. O. SIECKE, Deputy State Forester
T. T. MUNGER, Federal Forest Service
J. C. O'GORMAN, Wisconsin Logging Company
GEO. M. CORNWALL, Editor "The Timberman"
C. H. FLORY, Federal Forest Service

Oregon is the foremost timber state in the Union. Of the standing timber remaining uncut in the United States fully twenty percent is within the boundaries of the State of Oregon. According to the best available estimates, this stumpage aggregates approximately 480 billion feet, board measure. Over 11 million acres of timber land, carrying 360 billion board feet of timber are privately owned and 13 million acres, carrying 120 billion board feet, are in the National Forests. The timber in private hands is being cut as the interests of the owners direct. That in public ownership is being sold according to the requirements of the local markets. All National Forest timber is for sale.

This dual ownership of timber opens up two fields. The first is distinctly that of harvesting an immense crop of mature timber. Under the present system of taxation and with the prevailing rates of interest, private enterprise cannot profitably grow timber. The interest of the private owner is largely at an end with the removal of the standing timber. This is the sphere of the logging engineer. The domain within the National Forests is dedicated to the production of timber for all time. It is the policy of the Forest Service to restock the cutover areas and to plant all denuded areas which are capable of growing timber. The planting, growing, and protecting of timber crops, is the special field of the technical forester.

The profession of logging engineering is of recent development. In the past, low prices for standing timber, easy logging and high prices for lumber have made profits to the lumberman sure, and these same conditions have not demanded economy in operation. With high-priced stumpage, timber difficult of access, and low prices for lumber, a revolution in the entire lumber in-

dustry has been forced. It was a case of economy in operation or financial failure. Bringing the logs over rough country to the mill involves many engineering problems. Among these are the construction of logging railroads, the installation of sky line and ground logging devices, and the operation of special steam and electrical logging equipment. The course in Logging Engineering is designed to equip young men for this field. The course as outlined in this catalogue was prepared under the direction of some of the ablest timbermen in the Pacific Northwest, and the strictly technical subjects in the course are taught by one of the foremost logging engineers in the United States.

The forests of the United States are in the West. In this region the student of forestry is in immediate contact with the conditions he is studying. Oregon alone has 24 million acres of forest land. The greater part of this acreage is west of the Cascade Mountains and consequently easily accessible from the College at Corvallis. There, an immense laboratory for observation and field work is at the very doors of the School of Forestry. Through a cooperative agreement with the Forest Service, the entire school goes into the Santiam National Forest for two weeks each spring for field work. This work, largely cruising and mapping, is under the direct supervision of officers of the Forest Service, and the results of the work are accepted by the Government. Some of the largest sawmills in the world are but two hours travel from the College. Pulp mills, wood distillation plants, box and furniture factories are easily accessible. In addition to this, summer work in the forests or in logging camps is easy to obtain, and is expected of all forestry and logging students. All this points to the fact that here is the ideal place to study the profession of Forestry.

Forestry work in this country is yet in its infancy; but it is developing rapidly. When the full economic importance of our forest resources is understood, more intensive methods will be required and many times the number of men now employed will be needed. The Forest Service is steadily raising the requirements for admission to its ranks. Nontechnical men who cannot meet the new requirements are naturally retired. The field for the technically trained man is consequently becoming broader. The State, too, is feeling the need of trained men in Forest-protection work. As time goes on this field will be much more extensive.

The work in Forestry is in charge of technically trained men, all of whom have had experience in Federal Forestry work. In

this, as well as in logging engineering, technical subjects are not permitted to crowd out other subjects requisite in an education. The logging engineer and the forester are prepared for citizenship by courses in sociology, political economy, state and local government, tax and labor problems, and other kindred subjects. The fact that the professional man should be prepared for leadership in his community, as well as for success in his chosen work, is always kept clearly in view.

Equipment. For the first time since the creation of the school of Forestry at the College it has been possible to provide adequate facilities for properly handling the work. A three-story forestry building, eighty feet wide and one hundred and forty feet long, is being constructed to house the work in forestry and logging engineering. This building will contain roomy laboratories for work in silviculture, dendrology, mensuration, forest protection, technology, drafting, and logging engineering. These laboratories will be well supplied with the various forms of instruments and equipment which the peculiar work of each requires.

In addition to the laboratories, space is to be devoted to a collection of manufactured wood products, designed to show the various uses to which wood may be put, and to a forest museum in which will be assembled large specimens of all commercial woods of the United States. All available publications dealing with forestry and logging subjects are provided for the use of students.

FORESTERS' SHORT COURSE.

(November 6, 1916 to April 13, 1917.)

There are many men in the nontechnical grades of the Forest Service who desire special instruction along certain lines. There are others who desire to get into State Forestry work or into the nontechnical work of the Forest Service. This course is planned to be of assistance to such men. The work is designed to fit the needs of the individual. For example, one who desires work in cruising and elementary surveying may take those subjects. One who desires to do special work in drafting may devote the greater portion of his time to that work. At the same time the student may take such other subjects as will best satisfy his requirements.

SUGGESTED SHORT COURSE SUBJECTS

	Semester	
	1st	2nd
Forest Protection (For. A. B.)	3	3
Forest Measurements (For. C. D.).....	3	3
Forest Surveying and Mapping (For. E. F.).....	3	3
Forest Improvements (For. G. H.)	3	3
Forest Administration (For. K. L.)	1	1
	—	—
	13	13

DEGREE COURSE IN GENERAL FORESTRY

The following lists of subjects are recommended for students in general forestry and in logging engineering respectively. For graduation the College requires the student to complete 136 credit hours. Of this number, the student in general forestry must take 60 hours of professional work, 25 hours of science, 18 hours in general subjects and 6 hours in mathematics. In logging engineering the student must complete 60 hours of professional work, 10 hours of science, 18 hours of general subjects and 6 hours in mathematics. In all cases the student's course of study must be approved by the Dean of the School. Only in exceptional cases will the outlines for the Freshman and Sophomore years be modified.

Freshman Year.	Semester	
	1st	2nd
Modern English Prose (Eng. 81, 82)	3	3
Trigonometry (Math. 14)	3	
Elementary Analysis (Math. 34)		3
General Forestry (Forestry 101, 102)	4	1
Elementary Mensuration (Forestry 304)		4
General Chemistry (Chem. 100, 101)	3	3
Forest Botany (Botany 30, 31)	3	3
Library Practice (Lib. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
Drill (Military 1, 2)	1	1
Gynnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	—	—
	18½	17½

	Semester	
	1st	2nd
Sophomore Year.		
General Physics (Physics 1, 2)	3	3
General Zoology (Zool. 108, 109)	3	3
Elementary Mensuration (Forestry 305)	4	
Forest Pathology and Taxonomy (Bot. 35)		4
Silviculture (Forestry 201, 202)	3	3
Forest Geology (Geology 161)	3	
Forest Protection (Forestry 505)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Junior Year.

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Advanced Mensuration (Forestry 301, 302)	6	4
Forest Entomology (Entom. 304)		3
Advanced Silviculture (Forestry 203, 204)	3	2
Elementary Economics (Com. 210)	3	
Forest History and Economics (For. 103)		3
Military Science (Theo. Inst. 1, 2)	1	1
Military Drill (Military 5, 6)	1	1
Uses of Wood (Forestry 506)	2	

Senior Year.

Forest Finance (Forestry 350)	5	
Working Plans (Forestry 352)		5
Dendrology (Forestry 501, 503)	5	3
Lumbering (Forestry 404)		5
Forest Improvements (Forestry 405)	3	
Timber Technology (Forestry 502)		4
Timber Testing (Exp. E. 238)		1
Seminar (Forestry 408, 409)	1	1
Administration (Forestry 410)	3	

DEGREE COURSE IN LOGGING ENGINEERING

	Semester	
	1st	2nd
Freshman Year.		
Modern English Prose (Eng. 81, 82)	3	3
Trigonometry (Math. 14)	3	
Elementary Analysis (Math 34)		3
General Forestry (Forestry 101, 102)	4	1
Elementary Mensuration (Forestry 304)		4
General Chemistry (Chem. 100, 101)	3	3
Woodwork (Ind. Arts. 110, 111)	2	2
Library Practice (Lib. 1)	1½	
Hygiene (Phys. Ed. 10)	1½	
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	1½	
	<hr/> 17½	<hr/> 17½

Sophomore Year		
Engineering Physics (Physics 101, 102)	4	4
Principles of Economics (Com. 210)	3	
Labor Problems (Com. 213)		3
Blacksmithing (Ind. Arts 151)	2	
Toolmaking and Tempering (Ind. Arts 152)		1
Machine Shop (Ind. Arts 202)		1
Elementary Mensuration (Forestry 305)	4	
Mechanical Drawing (M. E. 151)	2	
Dendrology (Forestry 504)		3
Forest Protection (Forestry 505)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	1½	1½
	<hr/> 16½	<hr/> 16½

Semester

Junior Year.

1st 2nd

National Government (Com. 320)	3	
State and Municipal Government (Com. 322)		3
Mensuration (Forestry 301, 302)	6	4
Logging Railroads (Forestry 601, 607)	3	3
Logging Materials (Exp. E. 240)		2
Elements of Steam Engineering (M. E. 303)	2	
Steam Laboratory (Exp. E. 255)	1	
Mechanism (M. E. 204)		3
Military Science (Theo. Inst. 1, 2)	1	1
Drill (Military 5, 6)	1	1

Senior Year.

Logging Engines (Forestry 602)	4	
Bridge Construction (Forestry 603)		3
Logging Devices and Equipment (For. 604, 605).....	5	4
Lumbering (Forestry 404)		5
Forest Valuation (Forestry 350)	5	
Timber Technology (Forestry 502)		4
Timber Testing (Exp. E. 238)		1
Electrical Machinery (E. E. 403)	3	
Electrical Lumbering Machinery (E. E. 404)		2
Special Subjects (Forestry 606)		2
Logging Management (Forestry 407)		3

The following courses are offered:

A. Forest Protection. Causes of forest fires. The methods of controlling forest fires. The proper organization of fire patrol over definite areas. Fire fighting devices. Lookout stations, telephone lines, roads and trails, with reference to fire control. Different methods applicable to different regions.

Forester's Short Course; first semester; 3 credits; 3 recitations.

B. Forest Protection. A continuation of Course A.

Forester's Short Course; second semester; 3 credits; 3 recitations.

C. Forest Measurements. The fundamental principles involved in computing the solid contents of logs and trees. Method of constructing scale rules. Height measures. Forest Service

methods of cruising timber. Other methods. Discounts for defects. Volume tables. Practical demonstrations in the woods.

Forester's Short Course; first semester; 3 credits; 1 recitation, 2 laboratory periods.

Fee: \$1.00.

D. Forest Measurements. A continuation of Course C.

Forester's Short Course; second semester; 3 credits; 1 recitation, 2 laboratory periods.

Fee: \$1.00.

E. Forest Surveying and Mapping. A study of the United States system of land surveys. Retracing surveyed lines. Methods employed in marking surveyed lines. The use of the compass; the surveyor's chain; plane table, Abney hand level. Practical field work in surveying. The use of the aneroid barometer in topographic surveying. The details of map making. Conventional signs used in mapping.

Forester's Short Course; first semester; 3 credits; 1 recitation, 2 laboratory periods.

Fee: \$1.00.

F. Forest Surveying and Mapping. A continuation of course E.

Forester's Short Course, second semester; 3 credits; 1 recitation, 2 laboratory periods.

Fee: \$1.00.

G. Forest Improvements. The construction of roads, trails, telephone lines, lookout stations, bridges, cabins, etc., costs.

Forester's Short Course; first semester; 3 credits; 2 recitations, 1 laboratory period.

H. Forest Improvements. A continuation of course G.

Forestry Short Course; second semester; 3 credits; 2 recitations; 1 laboratory period.

K. Forest Administration. The organization of the Federal Forest Service. The District Office. The National Forest. The State Forester's office. Organization of the State work. Forms used in the transaction of forest business. The preparation of reports.

Forester's Short Course; first semester; 1 credit; 1 recitation.

L. Forest Administration. A continuation of course K.

101. General Forestry. A preliminary survey of the whole field of forestry. A brief study of those conditions pointing to the need for conserving our natural resources. The forest regions of

the United States and the commercial trees native to those regions. Forest ownership, private, state, and national. The elements of state and national forest policy. The economic importance of the forests of the United States and of Oregon.

Freshman year; first semester; four credits; 4 lectures and recitations.

Reference texts: Van Hise: Conservation of National Resources. Moore & Brown: Elements of Forestry.

102. General Forestry. A continuation of course 101.

Forestry; freshman year; second semester; 1 credit; 1 recitation.

103. Forest History and Economics. The development of European forestry. Progress of American forestry. The economic importance of forest products. Transportation as affecting the lumber industry.

Forestry; Junior year; second semester; 3 credits; 3 lectures and recitations.

Reference text: Fernow: Economics of Forestry.

201. Silviculture. The art of establishing, developing, and reproducing trees, including their life-history, influences, modification, and growth. Forest description, covering general problems. Silvicultural systems of cutting, such as, selection, clear cutting, and coppice. Marking trees for various cuttings. Silvicultural management.

Forestry, sophomore year; 3 credits; 2 hours lecture; 3 hours field work.

Reference text: Graves: Handling of Woodlands.

Fee: \$1.00.

202. Silviculture. The improvement of woodlands; clearings; thinnings; damage cuttings. Protection as related to silviculture. Forestation, including seed production, seed collection, seed preservation, and seed testing. Natural versus artificial regeneration. Nursery practice. Planting. Afforestation.

Prerequisite: Forestry 201.

Forestry; sophomore year; second semester; 3 credits; 2 lectures; 3 hours field work.

Reference text: Graves: Handling of Woodlands.

Fee: \$1.00.

203. Advanced Silviculture. The practice of forestry in each silvicultural region of the United States, including study of physiography, management, protection, types, silvical characteristics

of important species, and market relations. Forest ecology, dealing with the reciprocal relations between trees and forests and their environment, including a study of types and their classification, forest formations, climate characteristics, soils, investigations, antecology, sinecology, and ecological experiments.

Prerequisite: Forestry 201 and 202.

Forestry; junior year; first semester; 3 credits; 2 recitations and 1 laboratory period.

Fee: \$1.00.

204. Advanced Silviculture. Silvics, including the measure of tolerance, study of sample plots, economic possibilities of species, and reproduction characteristics. Each student will be required to make a detailed silvical study of some definite forest tract and present a thesis covering the work.

Prerequisites: Forestry 201, 202 and 203.

Forestry; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

Fee: \$1.00.

301. Advanced Mensuration. Log rules. Scaling of logs in board feet, cord measure. Making of volume tables and form factor tables. Growth studies. Yield tables. Public land surveying, including obtaining true meridian, adjustment of instruments, and methods of subdividing land. Complete valuation surveys, including application of the methods learned in courses 304 and 305 to areas of timberland. Field work at the mills and in the woods. Each student is required to assist in making a complete valuation survey and in preparing a complete report on a given piece of timber.

Forestry; junior year; first semester; 6 credits; 4 recitations; 2 field periods.

Reference text: Graves: Forest Mensuration.

Fee: \$2.00.

302. Advanced Mensuration. A continuation of course 301. Forestry; junior year; second semester; 4 credits; 3 recitations; 1 field period.

Reference text: General Land Office: Manual of Surveying.

Fee: \$1.50.

303. Forest Mapping. Drill in the detail of Forest mapping. Forest Service plain lettering and conventional signs. Use of contour and road pens, ruling pen, cross section liner, pantograph, and lettering gauges. Crayon and ink coloring in Forest

Service legend, making of final reconnaissance and land classification maps.

Forestry; elective; freshman year, second semester; sophomore year; first semester; 2 credits; two laboratory periods.

304. Elementary Mensuration. Familiarizing students with the use of instruments employed in cruising timber: the box compass, the Forest Service standard compass, the Abney hand level, the Forest Service topographic hand level, trailer tape, cavalry sketching board. Practice in pacing. Methods of covering ground in timber cruising. Retracing Government surveys by use of original field notes. Use of light mountain transit. Stadia surveying. Triangulation.

Forestry; freshman year; second semester; 4 credits; 2 recitations; 2 field periods.

Fee: \$1.50.

305. Elementary Mensuration. The use of Forest Service and other hypsometers, the Biltmore stock, the Forest Service cruiser's stick, calipers, diameter tape. Methods of estimating and measuring heights and diameters of trees without special instruments. Topographic surveying on forested areas. The keeping of field notes. Approved method of traversing. Practice in surveying with aneroid barometers, telescopic alidade plane table. Combinations of methods.

Forestry; sophomore year; first semester; 4 credits; 2 recitations; 2 field periods.

Fee: \$1.50.

350. Forest Finance. Investments and costs in forest production. The value of forest property for destructive lumbering. Value of forest property for continued timber production. Appraisal of damages due to the destruction of forest property. Forest Taxation. Stumpage values. Comparison of forest values with agricultural values.

Forestry; senior year; first semester; 5 credits; 5 lectures and recitations.

Reference text: Chapman: Forest Valuation.

352. Working Plans. Consideration of data necessary in the preparation of working plans. Regulation of yield. The working plan report. Working plans for American forests.

Forestry; senior year; second semester; 5 credits; 5 lectures and recitations.

Reference texts: Roth: Forest Regulation. Recknagel: Theory and Practice of Working Plans.

404. Lumbering. The history of the lumber industry, including a study of the methods used in different regions. Special attention to lumbering operations in the Northwest. The transportation of logs from the woods to the mill. The use of steam machinery in skidding and hauling. Driving. The methods of milling. Seasoning and grading. The cost of logging and milling with reference to some definite operation. During the course, each student will be required to prepare a report from the data collected by personal study of some extensive logging and milling business.

Forestry; senior year; second semester; 5 credits; 2 recitations; 3 laboratory periods.

Reference text: Bryant: Lumbering.

405. Forest Improvements. A study of the planning, construction, and maintenance of the permanent improvements essential to the protection, administration, and use of a forest. Also the keeping of cost data for future estimating and supervision. Transportation improvements: roads, trails, bridges and signposts. Communication improvements: telephones, heliographs, wireless. Protective improvements: lookout stations, fire lines, tool caches. Quarters improvements: houses, cabins, barns, sheds, fences, water supply, drainage systems.

Forestry; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

406. Field Work. This course is based upon practical work performed by the student between the sophomore and junior years or between the junior and senior years. The work must be done on some modern logging operation or in connection with some technical forestry work carried on by the State or by the Forest Service. A report based upon an approved outline must be submitted.

Forestry; junior or senior years; from 1 to 5 credits.

407. Logging Management. The business problems connected with logging. Organization of working crews. Cost of operations. Cost-keeping systems. Improved methods. Efficiency studies.

Forestry; senior year; second semester; 3 credits; 3 recitations.

408. Seminar. Preparation and discussion of reports of special subjects. Current forestry and lumbering literature. Each student is required to prepare a thesis on some assigned subject.

Forestry; senior year; first semester; 1 credit; 2 consultation periods.

409. Seminar. Continuation of course 408.

Forestry; senior year; second semester; 1 credit; 2 consultation periods.

410. Administration. An analysis of the organization of the Federal Forest Service. The district. The local administrative unit. Methods of conducting timber sale, grazing and special use business. Administration of State forestry business.

Forestry; senior year; first semester; 3 credits; 3 recitations.

Reference texts: Forest Service manuals and bulletins.

501. Dendrology. Classification and identification of forest trees, including a study of forest ecology and taxonomy. The silvical characteristics of commercial species. Life-history and requirements of trees.

Forestry; senior year; first semester; 5 credits; 3 recitations; 2 laboratory periods.

Reference texts: Sudworth: Trees of the Pacific Slope. Sargent: Trees of North America.

Fee: \$2.00.

502. Wood Technology. Identification of wood by microscopic and macroscopic characteristics. Cell structure from a taxonomic standpoint. Defects due to knots, decay, and checks. Structural changes due to seasoning. Relation between moisture content and strength. Chemical properties. Utilization. The adaptation of wood to the minor industries. Wood preservation. Factors of decay and preservative methods. Relative value of preservatives.

Forestry; senior year; second semester; 4 credits; 3 recitations; 1 laboratory period.

Reference texts: Record: Economic Wood of the United States. Weiss: Preservation of Structural Timber. Kellogg: Lumber and Its Uses.

Fee: \$2.00.

503. Advanced Dendrology. A continuation of course 501.

Forestry; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.50.

504. Dendrology. The course in dendrology is designed to suit the needs of the logging engineer without considering the silvical studies which are required in the general Forestry course. Species of commercial importance in the Pacific Northwest are studied and their relation to all other species is clearly defined.

Forestry; sophomore year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

Reference text: Sudworth: Trees of the Pacific Slope.

Fee: \$1.50.

505. Forest Protection. Protecting the forests from fire, insects, and fungi. The course deals primarily with protection from fire, laying emphasis on preventive methods such as sentiment making; laws, both state and federal; patrol; and the reduction of risk by slash disposal; fire lines; grazing, etc. Planning an adequate fire fighting system in all its scientific phases. The business of fire fighting, including discovery, communication, transportation to fire, equipment, organization and work done. Federal, state, and private fire-control organizations.

Forestry; sophomore year; second semester; 3 credits; 3 recitations.

Fee: \$1.00.

506. Commercial Woods. The course is designed primarily to meet the requirements of the woodworker in choosing the species of wood best adapted to his needs, and in identifying the wood commonly used. Macroscopic and microscopic identification of different species. Dendrology and its significance in wood technology. Taxonomy, showing how trees are classed.

Industrial Arts; junior year; first semester; 2 credits; 1 lecture; 1 laboratory or field period.

Reference texts: Noyes: Wood and Forest. Kellogg: Lumber and Its Uses.

Fee: \$1.00.

507. Uses of Wood. Properties which affect the values of the various species of wood. Particular advantage of wood for general building and construction. Planing mill products. Boxes and crates. Car construction, and secondary uses. Factory uses of commercial woods. Cost of lumber. Cost of building with different materials. Commercial grades. Defects. Utilization of in-

ferior woods. Durability. Cabinet and fancy woods. Identification of woods.

Forestry; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

Reference text: Kellogg: Lumber and Its Uses.

601. Logging Railroads. Location of the road with reference to the method of logging. Title to rights of way. Clearing rights of way. Culverts. Cuts and fills. Grades and curves permissible under varying conditions. Switch backs. Inclines. Laying steel. Ballasting. A study of logging methods on different logging operations is made.

Forestry; junior year; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.50.

602. Logging Engines. A study of the construction and operation of engines used in logging operations. Laboratory and field work.

Forestry; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods.

603. Bridge Construction. This course deals with the construction of the peculiar type of bridges used in logging operations. Factor of safety. Costs. Preliminary laboratory exercises followed by studies on logging operations.

Forestry; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

Fee: \$1.50.

604. Logging Devices and Equipment. Bridge, flume, and chute construction. Methods of slinging rigging. Types of cars. Skidding and loading devices. Electrical machines used in logging. Detailed investigation of costs and makes of equipment. Special reports accompanied by photographs, maps, and drawings will be required. At least three weeks of each semester must be devoted to the study of some up-to-date logging operation.

Forestry; senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

605. Logging Devices and Equipment. A continuation of course 604.

Senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods.

606. Special Subjects. A study of special topics connected with the logging industry. Tax law, freight rates, special laws, etc.

Elective; senior year; first semester; 2 credits.

607. Logging Railroads. A continuation of course 601.

Forestry; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$1.50.

SCHOOL OF HOME ECONOMICS

EXECUTIVE COMMITTEE

MARY ELIZA FAWCETT, Chairman
HELEN BRYCE BROOKS,
AVA BERTHA MILAM.

The School of Home Economics offers the following courses of study: a one-year vocational course, a four-weeks course in Food Preparation, Dressmaking, Textiles, etc., which is offered in connection with the Winter Short Course; a six-weeks course for teachers, offered in connection with the work of the Summer School; a night course of twelve weeks for women of mature years; two four-years courses, each of which leads to the degree of Bachelor of Science, and a graduate course leading to the degree of Master of Science.

Vocational Courses. The one-year Vocational course is provided especially for those women whose schooling may not qualify them to enter the degree courses, whose duties demand that they shall content themselves with a brief period of training for their life work, or whose aim in seeking training at the College is exclusively practical. The purpose of the other short courses in Home Economics is quite similar to this—to provide, in the short time assigned to the particular courses, the fullest and most fruitful training that is possible to offer with the facilities of a thoroughly modern School of Home Economics, and to present this training in such a way that it shall be most immediately and constructively helpful to the particular patrons of the given course. Only the one-year vocational course and the regular degree courses are outlined here, the others being presented in the usual special bulletins issued for the Winter Short Course and the Summer School.

Admission to any of the vocational courses demands an educational qualification not greater than an eighth grade or common school course; and in the instance of mature persons, otherwise capable of carrying on the work, even this qualification may be waived.

Degree Courses. These courses are planned fundamentally to equip women for their normal life service, that of home makers, as well as to prepare teachers of Home Economics, Extension Workers, Dietitians, and Institutional Managers.

Fundamentally, the young women in the School of Home Economics are offered such training as will help them to be prepared to adjust themselves readily to their environment. Since the relation of women to the economic world has undergone great changes during the last one or two decades, it follows that the education of young women must be such that it will prepare them to be efficient and serviceable to their community.

That the young women completing this course may be good citizens as well as good housekeepers; good business managers in their homes, as well as good cooks; broadly educated women, as well as specially trained workers, the courses of study in the School of Home Economics have been planned to give a liberal as well as a technical education.

Many opportunities are open for the woman capable of solving the problems of good food service for large numbers of people, and for experts in the management of large institutions. Equally attractive opportunities are available for the expert needlewoman, the tasteful designer of gowns, the competent dressmaker or milliner, the ladies' tailor, and the woman with artistic resources as a household decorator and furnisher. Opportunities for teaching Home Economics, not only in the high schools and colleges, but as supervisors in the common schools of cities, and in the consolidated community schools of progressive rural communities, are becoming more general and more desirable. Facilities for specializing in this work at the College are therefore given special attention.

More and more the life of the modern community is dependent upon institutions. Women are rapidly taking their places as executive and administrative leaders in the important functions of these institutions. Hospitals, Institutional Homes, Asylums, Educational Institutions, and Social Centers, are more and more demanding the service of the women of skilled technical accomplishments. There is a growing demand for dietitians in the hospitals and large institutions. The training in dietetics, catering, and business management offered the young women at the College through the School of Home Economics, assists in the liberal and practical preparation for this employment.

Quartered in a new building, provided with a thoroughly practical modern heating, ventilating, and sanitary system, and equipped with the most approved facilities for conducting the

work of the various departments, the School of Home Economics is in a very fortunate position for making its courses of the utmost value to its patrons—not only to its resident students, but to the communities of the State at large wherever its extension activities may penetrate.

Vocational Course.	Semester	
	1st	2nd
Food Preparation (D. S. H. 1)	5	5
Care of Children (D. S. J).....		1
Hand Sewing and Garment Making, Dressmaking (D. A. K, L).....	4	4
Sanitation and Care of the Home (D. S. K).....	2	
Elementary Physiology (Zool. 211).....	2	
Preventive Medicine (Bact. B)	1	
Home Nursing and Invalid Cookery (D. S. M).....		2
House Furnishing (D. A. N)		2
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 1, 2)	1	1
	<hr/> 15	<hr/> 15

REQUIREMENTS FOR GRADUATION IN SCHOOL OF HOME ECONOMICS

In order to secure the degree in Home Economics a minimum of 132 college credits must be completed. The subjects required in the Freshman and Sophomore years are prescribed. The subjects for the Junior and Senior years may be selected from the following groups:

Group I Degree Course

- General group at least 18 credits.
- Science group at least 6 credits.
- Home Economics group at least 22 credits.
- Free electives 17 credits.

Group II Degree Course

- General group at least 18 credits.
- Science group at least 6 credits.
- Home Economics group at least 12 credits.
- Free electives 27 credits.

DEGREE COURSES IN HOME ECONOMICS

Candidates for the degree of Bachelor of Science in Home Economics will pursue one of two prescribed group courses for the first two years. The freshman and sophomore years of both courses are similar but begin to differentiate in the direction of the aim of each course. The junior and senior years, however, allow liberal electives from the several groups of studies in Home Economics, a minimum number from each group being prescribed, besides a free choice varying from 17 to 27 credits from any school or department in College.

Group I comprises courses that offer to women the opportunity to prepare themselves to become teachers of Domestic Science and Domestic Art, or to become Dietitians, or Institutional Managers. The first two years, as prescribed, give the necessary foundation for any one of these occupations; the junior and senior years are elective by groups, a fact which provides for intensive specialization in any one of these departments.

	Semester	
	1st	2nd
Freshman Year		
General Chemistry, (Chem. 102, 103)	3	3
Hand Sewing, Garment Making, (D. A. 101, 102).....	3	3
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32).....	3	3
Principles of Botany, (Bot. 22, 23)	2	2
Modern Language	3	3
Library Practice, (Lib. 1).....		½
Hygiene, (Phys. Ed. 10).....	½	
Gymnasium, (Phys. Ed. 5, 6).....	1	1
	17½	17½
Sophomore Year		
Organic Chemistry; Chemistry of Foods, (Chem. 200, 402)	4	4
Food Preparation, (D. S. 101, 102).....	3	3
Design and Color, (Art 204).....	2	
Household Physics, (Phys. 131).....	4	
Household Bacteriology, (Bact. 300).....		3
Home Nursing, (D. S. 511).....		3
Modern Language	3	3
Gymnasium, (Phys. Ed. 7, 8).....	1	1
	17	17

The work of the junior and senior years may be elected from the groups below with the restrictions indicated at the head of each group.

General Group.

A minimum of 18 credits must be chosen from this group.

English, at least 6 credits.

Economics,)

Political Science,) at least 9 credits.

Sociology,)

Psychology, at least 3 credits.

History,

Language,

Mathematics.

Science Group.

A minimum of 6 credits must be chosen from this group.

Physiology (Prerequisite for Dietetics).

Zoology.

Chemistry.

Botany.

Bacteriology.

Home Economics Group.

A minimum of 22 credits must be chosen from this group.

	Semester	
(a) Domestic Science	1st	2nd

Dietetics, (D. S. 201)	4	
Dietetics, (Invalid Cookery) (D. S. 202).....		2
Food Preparation, (D. S. 104, 105).....	3	3
House Sanitation, (D. S. 301)	2	
Housewifery, (D. S. 510)		2
House Administration, (D. S. 501)		3

(b) Domestic Art

Advanced Dressmaking, (D. A. 203, 204)	3	3
Advanced Textiles, (D. A. 601)		2
Costume Design, (D. A. 701)	2	
Dressmaking, (D. A. 201, 202)	3	3
Millinery, (D. A. 301)		2
House Construction, Decoration and Furnishing, (D. A. 501)		3

	Semester	
	1st	2nd
(c) Home Administration		
Dietetics, (D. S. 201)	4	
Dietetics, (Invalid Cookery) (D. S. 202)		2
House Sanitation, (D. S. 301)	2	
Housewifery, (D. S. 510)		2
House Administration, (D. S. 501)		3
House Construction, Decoration and Furnishing, (D. A. 501)	3	
Food Preparation, (D. S. 104, 105)	3	3
Advanced Textiles, (D. A. 601)		2
Dressmaking, (D. A. 201, 202)	3	3

(d) Institutional Management		
Dietetics, (D. S. 201)	4	
Dietetics, (Invalid Cookery) (D. S. 202)		2
Institutional Management, (D. S. 504)	3	
Catering, (D. S. 210)		2
Food Preparation, (D. S. 104, 105)	3	3

(e) Education		
General Psychology, (Ind. Educ. 101)	3	either semester
Educational Psychology, (Ind. Educ. 102)	2	either semester
Principles of Education, (Ind. Educ. 131)	3	either semester
Special Methods in Home Economics, (Ind. Educ. 160)	3	either semester
Special Methods in Domestic Art, (Ind. Educ. 164)	2	either semester
Special Methods in Domestic Science, (Ind. Educ. 165)	2	either semester

Industrial Education 160 is prerequisite to Industrial Education 164 and 165.

Psychology, (Ind. Educ. 101) and Principles of Education, (Ind. Educ. 131) are open to juniors. Industrial Education 160 is open to juniors in the second semester.

(f) Applied Design		
Basketry, (D. A. 402)	2	
Hand Work and Weaving, (D. A. 405)		2
Design, (Art 204)	2	
Clay Modeling, (Art 413, 414)	2	2
Metal Work, (Art 600, 601)	2	2

Free Electives

An aggregate of 17 credits may be free electives. These may be chosen from any school or department in College, such as Agriculture, Forestry, Commerce, Pharmacy, etc., provided the prerequisites are met.

Group II comprises courses that offer to women the opportunity to prepare themselves in Domestic Science and Domestic Art primarily for use in the home, and at the same time afford abundant opportunity, by the freedom of election in the junior and senior years, for the gratification of individual inclination. Group II does not prepare students for positions as teachers or dietitians.

	Semester	
	1st	2nd
Freshman Year		
Elementary Household Chemistry, (Chem. 12, 13)	3	3
Hand Sewing, Garment Making, (D. A. 101, 102)	3	3
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32)	3	3
Principles of Botany, (Bot. 22, 23)	2	2
Modern Language	3	3
Library Practice, (Lib. 1)		½
Hygiene, (Phys. Ed. 10)	½	
Gymnasium, (Phys. Ed. 5, 6)	1	1
	<hr/>	<hr/>
	17½	17½
Sophomore Year		
General Science, (Physiology, Bacteriology, Physics).....	4	4
Food Preparation, (D. S. 101, 102)	3	3
Design and Color, (Art 204)	2	
English	3	3
Home Nursing, (D. S. 511)		3
Modern Language	3	3
Household Accounting	1	
Gymnasium, (Phys. Ed. 7, 8)	1	1
	<hr/>	<hr/>
	17	17

The work of the junior and senior years may be elected from the groups below with the restrictions indicated at the head of each group.

General Group

A minimum of 18 credits must be chosen from this group.

English, at least 6 credits.

Economics,)

Political Science,) at least 9 credits.

Sociology)

Psychology

History

Language

Mathematics

Science Group

A minimum of 6 credits must be chosen from this group.

Physiology (Prerequisite for Dietetics)

Zoology

Chemistry

Botany

Bacteriology

Home Economics Group

A minimum of 12 credits must be chosen from this group.

	Semester	
	1st	2nd
(a) Domestic Science		
Dietetics, (D. S. 203)	4	
Food Preparation, (D. S. 104, 105)	3	3
House Sanitation, (D. S. 301)	2	
Housewifery, (D. S. 510)		2
House Administration, (D. S. 501)		3
(b) Domestic Art		
Advanced Dressmaking, (D. A. 203, 204)	3	3
Advanced Textiles, (D. A. 601)		2
Costume Design, (D. A. 701)	2	
Dressmaking, (D. A. 201, 202)	3	3
Millinery, (D. A. 301)		2
House Construction, Decoration and Furnishing, (D. A. 501)	3	

	Semester	
	1st	2nd
(c) Home Administration		
Dietetics, (D. S. 203)	4	
House Sanitation, (D. S. 301)	2	
Housewifery, (D. S. 510)		2
House Administration, (D. S. 501)		3
House Construction, Decoration and Furnishing, (D. A. 501)	3	
Food Preparation, (D. S. 104, 105)	3	3
Advanced Textiles, (D. A. 601)		2
Dressmaking, (D. A. 201, 202)	3	3

(d) Institutional Management		
Dietetics, (D. S. 203)	4	
Institutional Management, (D. S. 504)	3	
Catering, (D. S. 104, 105)		2
Food Preparation, (D. S. 104, 105)	3	3

(e) Education		
General Psychology, (Ind. Educ. 101).....	3	either semester
Educational Psychology, (Ind. Educ. 102).....	2	either semester
Principles of Education, (Ind. Educ. 131).....	3	either semester
Special Methods in Home Economics, (Ind. Educ. 160)	3	either semester
Special Methods in Domestic Art, (Ind. Educ. 164)	2	either semester
Special Methods in Domestic Science, (Ind. Educ. 165)	2	either semester

Industrial Education 160 is prerequisite to Industrial Education 164 and 165.

Psychology, (Ind. Educ. 101) and Principles of Education, (Ind. Educ. 131) are open to juniors. Industrial Education 160 is open to juniors in the second semester.

	Semester	
	1st	2nd
(f) Applied Design		
Basketry, (D. A. 402)	2	
Hand Work and Weaving, (D. A. 405)		2
Design, (Art 204)	2	
Clay Modeling, (Art 413, 414)	2	2
Metal Work, (Art 600, 601)	2	2

Free Electives

An aggregate of 27 credits may be free electives. These may be chosen from any school or department in College, such as Agriculture, Forestry, Commerce, Pharmacy, etc., provided the prerequisites are met.

DOMESTIC ART

HELEN BRYCE BROOKS, Professor
GRACE GILLET, Instructor
BARBARA MOORE, Instructor
CORA ELIZABETH PLATT, Instructor
HELEN PEER, Instructor
JUNE SEELEY, Instructor
ANNA CASTLEBERRY, Instructor
MARGARET MOREHOUSE, Instructor

The following courses are offered:

K. Hand Sewing and Garment Making. Lectures relating to textiles, their production and manufacture, given for the purpose of assisting the home maker in her selection and use of the fabrics used in the home. Emphasis upon the care and storage of household linens. The laboratory work is planned to give the student practical experience in the making of all needlework problems that are to be met in the home.

Vocational course; first semester; 4 credits; 2 recitations; 4 laboratory periods.

Fee: \$0.50.

L. Dressmaking. Follows Course K. Lectures relating to the manufacture of cloth, its adulteration, economical purchasing, and use. Laboratory work gives the student experience in the making of wash dresses, childrens' dresses, woolen dresses, and the renovating and making of one woolen dress. Draughting of patterns; the use of commercial patterns.

Vocational course; second semester; 4 credits; 2 lectures; 4 laboratory periods.

Fee: \$0.50.

N. House Furnishing. A practical course in the decorating and furnishing of the entire house. The problems of the economic and artistic furnishing will be considered. Visits to house-furnishing stores for the purpose of selecting materials will be a feature of this course.

Vocational course; second semester; 2 credits; 2 lectures; 1 laboratory period.

Fee: \$0.50.

101. Sewing. The fundamental principles of hand and machine sewing applied to household linens and undergarments. Darning, patching, and care of clothing are considered.

The study of the development of the textile industries will give a deep appreciation for fabrics, and the responsibility for thoughtful purchasing.

Freshman year; first semester; 3 credits; 1 recitation; 3 laboratory periods.

Fee: \$0.50.

102. Garment Making. Continuation of course 101 in which draughting and making of undergarments will be presented. Simple embroidery stitches will be taught where such are applicable. The study of cotton will give an added value to the garments being made.

Prerequisite: Domestic Art 101.

Freshman year; second semester; 3 credits; 1 recitation; 3 laboratory periods.

Fee: \$0.50.

201. Dressmaking. The fundamental principles of dressmaking; the draughting, making, and adjusting of patterns to measurements; the making of shirt waists, tailored skirts, and a simple cotton dress.

The textile work will be a study of linen.

Prerequisites: Domestic Art 101, 102; Art 102, 103.

Junior year; first semester; 3 credits; 1 recitation; 3 laboratory periods.

Fee: \$0.50.

202. Dressmaking. Continuation of course 201.

The textile work will be a study of silk and wool.

Prerequisite: Domestic Art 201; Art 204.

Elective; 3 credits; 1 recitation; 3 laboratory periods.

Fee: \$0.50.

203. Tailoring. This course has for its problem the making of a cloth jacket suit. Careful draughting of the patterns and excellence of construction and finish will be required.

Prerequisites: Domestic Art 202, 203.

Elective; second semester; 3 credits; 1 recitation; 3 laboratory periods.

Fee: \$0.50.

204. Advanced Dressmaking. Draughting and making of elaborate gowns. Emphasis on color combinations, technique, suitability of design for material used, and for purposes intended.

Prerequisites: Domestic Art 202, 701.

Elective; first semester; 3 credits; 1 recitation; 3 laboratory periods.

Fee: \$0.50.

301. Millinery. Designing and constructing buckram and wire frames. Making and placing of trimmings, renovation of materials, straw sewing, bow making, and the construction of a hat from foundation to completion.

Elective; second semester; 2 credits; 2 laboratory periods.

Fee: \$1.00.

401. Basketry. A form of decorative art which involves careful consideration of form, color, and design; these principles will be considered in the making of rugs, reed baskets, stools, and raffia baskets.

Elective; first semester; 2 credits; 3 laboratory periods.

Fee: \$4.00.

404. Handwork and Weaving. The study of advanced handwork, knitting, weaving, embroidery stitches and design as applied to costume, embroidery, and decorative design for household purposes.

Elective; second semester; 2 credits; 3 laboratory periods.

Fee: \$3.00.

501. House Construction and Decoration. Two lectures and two laboratory periods each week to the study of house construction and furnishings. The laboratory hours are devoted to the making of plans for medium-sized residences; the best utilization of space, the most economical placing of equipment, and the decoration and furnishing of a house in the most economical, sanitary, and artistic manner. The lectures relate to the development of house building and reasons for the selections. All phases of house furnishing will be studied—floor coverings, furniture, linens needed, curtain hangings, china, silver, pictures—in such a manner as to give a full grasp of a problem likely to be met by every student.

Elective; either semester; 3 credits; 2 recitations; 2 laboratory periods.

Fee: \$0.50.

502. House Construction and Decoration. Continuation of 501.

Elective; second semester; 2 credits; 1 recitation; 2 laboratory periods.

Fee: \$0.50.

601. Advanced Textiles. The identification of textile materials, their names, kinds, prices, and widths; variation in weave in regard to beauty and strength; the use and value of cotton, silk, wool, and linen for clothing and household furnishings. The identification of fibers and substitute material by means of the microscope; the chemical examination of fibers, including tests to determine content of cloth and adulteration; and proper use of materials in relation to cleansing and laundering.

Elective; second semester; 2 credits; 2 recitations; 1 laboratory period.

Fee: \$0.50.

701. Costume Design. Study of the figure; sketching of garments, hats, and gowns; draughting of patterns; designing and modeling in material; study of design for embroidery and dress decoration.

Elective; first semester; 2 credits; 1 recitation; 2 laboratory periods.

Fee: \$1.00.

DOMESTIC SCIENCE

AVA BERTHA MILAM, Professor
ALICE MARKS DOLMAN, Assistant Professor
SARAH LOUISE LEWIS, Assistant Professor
ALMA GRACE JOHNSON, Instructor
BERTHA DAVIS, Instructor
LAURA JEAN CHENEY, Instructor
LILLIAN WILES FRANCIS, Instructor
CHRISTIE MOORE, Instructor
SIBYLLA HADWEN, Instructor
INEZ BOZORTH, Secretary

The Department of Domestic Science is located in the new Home Economics building and occupies the basement, first floor, and one-half of the second floor of the completed east wing of this structure. There are four large laboratories, with excellent modern equipment for all types of food preparation. A small laboratory is equipped with various kinds of cooking apparatus and is designed for experimental work. Adjoining the experimental laboratory is a

dining room large enough to accommodate twenty people. This is used for meal serving and enables the students to put into actual practice the knowledge gained elsewhere.

Equipment has been installed in the cafeteria for the use of classes in Industrial Management.

The following courses are offered:

H. Food Preparation. The study of food, its source, its economical purchase, storage, and use. The effect of heat and micro-organisms on food, the preservation of fruits and vegetables by canning, and changes undergone by food materials in the body. Laboratory work in the preparation of vegetables, fruits, meats, breads, cakes, and pastry with study of proper combinations and the careful estimation of costs and quantities.

Vocational course, first semester; 5 credits; 3 recitations; 4 laboratory periods.

Text: Kinne & Cooley: Foods and Household Management.

Fee: \$6.00.

I. Food Preparation. A continuation of course H. Careful instruction in the preparation of menus and the selection of food that it may be properly adapted to the age and need of the consumer. Special attention to the preparation and service of meals.

Vocational course, second semester; 5 credits; 3 recitations; 4 laboratory periods.

Text: Kinne & Cooley: Foods and Household Management.

Fee: \$6.00.

J. Care of Children. Lectures relating to proper feeding and care of the child; its physical, mental, and moral development from infancy through adolescence.

Vocational course, second semester; 1 credit; 2 lectures.

K. Sanitation and Care of the Home. Lectures and laboratory hours relating to the study of the home. The choice of site for a dwelling. General construction, lighting, heating, plumbing, disposal of waste, and general care of the dwelling house. Laboratory time devoted to the study of modern labor-saving devices of the household and the best cleaning agents, the care of floors and woodwork, and the common laundry operations. This course is optional with that of English.

Vocational course; first semester; 2 credits; 2 lectures; 1 laboratory period.

Fee: \$0.50.

M. Home Nursing and Invalid Cookery. Lectures on the observation of symptoms, the administration of food and medicine, and the general care and comfort of the sick under home conditions.

The laboratory consists of the preparation of food for the sick and the manner of service.

This course is optional with that of English.

Vocational course, second semester; 2 credits; 2 lectures; 1 laboratory period.

Text: Aiken: Home Nurses Handbook of Practical Nursing.

Fee: \$2.00.

101. Food Preparation. An introduction to the subject of foods in their scientific and economic aspect. Laboratory work in the preparation of foods, with a study of the changes brought about by the application of heat. Experiments to illustrate the principles involved in cookery. The classes prepare all the common foods, in many ways. The lecture work includes the production, manufacture, and use of all food materials.

Prerequisites: General Chemistry 102, 103.

Sophomore year, first semester; 3 credits; 2 recitations; 1 laboratory period.

Text: Sherman: Food Products.

Fee: \$3.00.

102. Food Preparation. A continuation of course 101.

Sophomore year, second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$3.00.

103. Food Preparation. A survey course of 101 and 102 for graduates of secondary schools with training in Domestic Science.

Sophomore year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$3.00. Text: Sherman: Food Products.

104. Food Preparation. Elaboration of the principles taught in Food Preparation 101, 102. The laboratory work includes canning of fruits and vegetables, the making of jelly, and advanced work in vegetable cookery, meats and flour mixtures. The lectures are devoted to the study of nutrition and the cost of foods.

Prerequisites: Domestic Science 101 and 102. Organic Chemistry; Chemistry of Foods (Chemistry 200, 402.) Principles of Botany (Botany 20, 21.) Bacteriology 300.

Elective, first semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$3.50. Text: Stiles' Nutritional Physiology.

105. Food Preparation. A continuation of Food Preparation 104. Part of the time will be devoted to the preparation and serving of practice meals.

Elective, second semester; 3 credits; 2 recitations; 1 laboratory period.

Fee: \$3.50. Text: Stiles' Nutritional Physiology.

110. Experimental Cookery. The various methods and temperatures used in cooking are tested as to results. Wood, alcohol, oil, gasoline, and electricity are all used to produce the required heat and their comparative cost and effectiveness are studied. Labor-saving cooking devices are experimented with and the results recorded.

Prerequisite: Domestic Science 104, 105.

Elective; second semester; 2 credits; 2 three-hour laboratory periods.

Fee: \$2.00.

120. Methods in Demonstration. A course in which students are prepared to give public demonstrations in food preparation. Lectures are given on the results to be attained from demonstrations, equipment required, organization of plans, and general methods of procedure. Demonstrations are given by various teachers before the students, followed by student demonstrations.

Prerequisite: Domestic Science 104, 105.

Elective; second semester; 1 credit; 1 three-hour laboratory period.

Fee: \$1.50.

180. Food Preparation. For women desiring knowledge of home cookery. A study of typical foods and their preparation in attractive forms, with the planning and serving of meals.

One evening lesson a week. A term of twelve lessons.

Either semester; hours to be arranged.

Fee: \$2.50.

190. Camp Cookery. Instruction in various ways of combining into palatable and nutritious products such food materials as are available for use in camps. The making of different kinds of breads, as well as mulligans, griddle-cakes, and other camp dishes; practice during the latter part of the course in preparing food out

of doors by means of Dutch ovens; reflectors, and improvised cooking utensils.

Elective; junior or senior year in Forestry, Agriculture, Engineering and Commerce courses; second semester; 1 credit; 1 laboratory period.

Fee: \$2.50.

191. Food Preparation. A course designed to help men in planning and preparing their own meals. Instruction is given in the uses of foods in the body, the factors affecting food requirements, and the making of menus suited to the needs of individuals under various conditions of living. The practical work includes the making of numerous dishes and the serving of well-balanced meals at a reasonable cost.

Elective to all men of the College; first semester; one credit; one laboratory period.

Fee: \$2.00.

201. Dietetics. A scientific study of food materials in their relation to the daily dietary of families under various conditions of health and environment; a study of the dietary standards and the metabolism of carbohydrates, fats, and proteins. A comparison of the nutritive values of the common foods, made by computing, preparing, and serving dietaries of specific costs, furnishing specific nutrients.

Prerequisites: Domestic Science 104 and 105, Physiology 207, 208.

Elective; first semester; 4 credits; 2 recitations; 2 laboratory periods.

Fee: \$4.00. Text: Rose: Laboratory Manual of Dietetics; Farmer: Boston Cooking School Cook Book; Hill: Practical Cooking and Serving; Sherman: Chemistry of Food and Nutrition.

202. Dietetics. The preparation of food for the young child. The preparation of invalid diets and the study of disease as affected by foods.

Prerequisite: Domestic Science 201.

Senior year, second semester; 2 credits; 1 recitation; 1 laboratory period.

Fee: \$2.00.

203. Dietetics. A simplified course in dietetics dealing with a study of food materials in their relations to daily dietaries of families under various conditions of health and environment, and a

comparison of nutritive values of common foods made by computing, preparing, and serving dietaries of specific costs furnishing specific nutrients.

Prerequisites: Household Chemistry, 6 credits; General Science, 8 credits; Domestic Science 101, 102, 104, 105.

Elective, second semester of senior year, 4 credits; two recitations, two laboratory periods.

Fee: \$4.00.

210. Catering. Designed to prepare students for positions in large institutions, and to enable them to establish and maintain tea rooms and lunch rooms, and to act as caterers for private entertainments. The students assist in the purchase, preparation, and service of foods in the cafeteria, and are expected to devote the equivalent of eighteen hours a week to the course.

Elective; senior year; either semester; 2 credits; 1 laboratory period of six hours.

Fee: \$2.00.

301. House Sanitation. The house as a factor in health. Situation, surroundings, ventilation, heating, drainage, plumbing, lighting, and furnishing of the house. Investigation will be made of general sanitary conditions from a practical and scientific standpoint with special reference to the needs of the community, the household, and the school.

Prerequisite: Household Physics.

Junior year; first semester; 2 credits; 2 recitations.

Text: Talbot: House Sanitation (as guide).

501. Household Administration. This course deals with the organization and control of the family, the economic relations of the household, applying scientific and economic principles to its problems, including a study of the family income, and its equivalent in productive labor within the household. The family expenditures and their regulation. The study of the budget as a measure of standards of living; the domestic service problem and household efficiency.

Prerequisite: Economics 211.

Senior year; either semester; 3 credits; 3 recitations.

Text: Richards: The Cost Of Living.

504. Institutional Management. A course in the purchase of food and equipment in large quantities, methods of record keeping,

making of menus and the general methods of sanitation and care of buildings wherein many are housed.

Prerequisites: Domestic Science 104 and 105, Economics 211.

Parallel or prerequisite: Household Administration.

Senior year; either semester; 3 credits; 3 laboratory periods of three hours each.

510. Housewifery. A study in the efficient care of the house, from the chemical, economic, and practical standpoints, including such matters as the treatment of floors, walls, and woodwork; the removal of stains; the cleaning of rugs and carpets; laundering of household linen and clothing, and the selection of cleaning apparatus and machinery.

Prerequisites: General Chemistry 102, 103.

Fee: \$0.50. Text: L. Ray Balderston: Laundering.

Junior year; either semester; 2 credits; 1 3-hour laboratory period.

511. Home Nursing. The scientific care of the patient under home conditions, including bathing, dressing, and the administration of foods and medicine. The study of the observation of symptoms; first aid to the injured; disinfection and the management of communicable diseases.

Sophomore year; either semester; 3 credits; 3 recitations.

Text: Maxwell & Pope: Practical Nursing.

550. Modern Problems in Household Administration. The topics assigned for research will be chemical, physiological, bacteriological, economical, or sociological, according to the preferences and training of the individual students.

Graduate year; first semester; credits to be arranged.

551. Modern Problems in Household Administration. A continuation of the research work commenced in course 550.

Graduate year; second semester; credits to be arranged.

560. Social Ethics. $\frac{1}{2}$ credit; 1st semester.

701. Special Research in Cookery. In assigning research problems for graduate students, both the previous training and the students' preferences are considered. Assignment of problems to be worked upon during the year is made by the professor in charge.

Graduate year; first semester; credits to be arranged.

702. Special Research in Cookery. Continuation of research work commenced in course 701.

Graduate year; second semester; credits to be arranged.

SCHOOL OF MINES

HENRY MARTIN PARKS, Dean.

Four-years courses leading to the degrees Bachelor of Science in Mining Engineering, Ceramics, and Chemical Engineering are offered. The advanced degrees Mining, Ceramic, and Chemical Engineer are conferred upon the completion of the requisite amount of graduate work, as prescribed elsewhere in this catalogue.

Instruction is given by means of lectures and textbooks, supplemented by recitations, and by a great deal of work in the laboratories and field. While the more theoretical studies are not neglected, a determined effort is made to emphasize the practical application and value of all the subjects taught. For this reason, nearly fifty per cent of a student's time is spent in laboratory courses.

The School of Mines occupies a new, commodious, three-story and basement building especially designed for housing the lecture rooms and laboratories devoted to mining, metallurgy, ore dressing, geology, ceramic engineering, chemical engineering, and closely allied subjects.

The first two years in all three departments are identical, and are intended to give the student a thorough comprehension of those studies basic to all branches of engineering: namely, Mathematics, Physics, Chemistry, Mechanical Drawing, Plane Surveying, and Shop Work. To these fundamental subjects are added courses in Mineral Industry, Crystallography and Blowpipe Analysis, and Determinative Mineralogy.

In the last two years, the student takes up the technical studies distinctive of the course pursued. This leads to considerable variation in the work of the different departments, as is indicated in the outline of courses. Statics and Dynamics, Strength of Materials, Hydraulics, and Electrical Machinery are required, however, in all of them.

At least two months employment in industrial lines closely allied to the course pursued, is a prerequisite to entrance upon the senior year.

The work in the School of Mines is so broad in nature that it should equip a student for general engineering operations of many

kinds, but particular emphasis is placed, naturally, upon preparation for those fields of activity that are concerned with the discovery, mining or quarrying, and preparation for market, of the mineral wealth with which the Northwest is so richly endowed.

Equipment. The new Mines building provides spacious and well-lighted offices, laboratories, and lecture rooms for the work of this department.

The Assaying and Metallurgical laboratory is a cement-floored room 30 feet wide and 60 feet long on the first floor of the building and extends across the entire east end. It is amply lighted by windows on one side and both ends. At the south end of the room are the most modern type of oil and gasoline furnaces for fusion and other fire work. Conveniently arranged nearby are suitable lockers and work tables with the necessary tools, fluxes, etc. The north end of the room is adequately equipped with sinks, ventilating hoods, gas burners, electric hot plates, and other apparatus for carrying in the various operations involved in parting buttons, assaying solutions, making cyanide tests, etc. One corner of the laboratory is partitioned off for a balance room and provided with the most delicate balances obtainable for weighing the gold beads. Balances of both the Keller and Ainsworth makes are available. These are mounted on a specially constructed table not connected with the floor, in order to avoid vibration.

The Crushing and Sampling laboratory in the basement is 25 feet by 30 feet. It contains a power-driven sample crusher of the latest design and one of the recently modeled disk grinders, for properly pulverizing samples for assay or other purposes. The usual bucking-board and muller and other hand-grinding devices are also available for student use, together with a Jones sampler and other appliances used in preparing samples. All such work is done in this room, to avoid dust in the other laboratories.

The Ore-Testing laboratory is a room 25 by 30 feet on the first floor of the building. It is equipped with appliances for studying the behavior of ores when subjected to the various operations of jigging, vanner, table, and magnetic concentration.

The Mining Draughting room is furnished with convenient desks and tables and all necessary equipment for the use of mining students.

REQUIREMENTS FOR GRADUATION IN SCHOOL OF MINES

For graduation in the School of Mines a total of 136 college credits must be completed. It is expected that the suggested schedule as listed elsewhere for this School will be closely followed. Before graduation a student must complete credits as indicated in the following groups:

General group at least.....	3 credits
Science group at least.....	56 credits
Mining group at least.....	40 credits
Mathematics group at least.....	21 credits
Shop-work group at least.....	2 credits
Gymnasium at least.....	2 credits
Military Science at least.....	2 credits
Military Drill at least.....	6 credits
Restricted Electives at least.....	4 credits

MINING ENGINEERING

HENRY MARTIN PARKS, Professor.
 WILLIAM HAWES COGHILL, Professor
 GEORGE ELWIN STOWELL, Instructor.

The course in Mining Engineering is designed to give the student a thorough training in the fundamentals of the science of mining and metallurgy. It is of such a comprehensive character that a graduate finds it of aid in varied employments. He may expect that after having acquired the necessary maturity he will be able to hold a position as an assayer or chemist; a land or deputy mineral surveyor; a draughtsman and designer in an engineering establishment; on the geologic staffs of railroads, mining, or exploration companies; in the land classification work of the Government Forest Service; in the Government Geologic or Coast and Geodetic Surveys; on state geological surveys or in any one of many branches of actual mining, milling, and smelting operations.

DEGREE COURSE IN MINING ENGINEERING

	Semester	
	1st	2nd
Freshman Year.		
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31)		5
General Chemistry (Chem. 105, 106)	5	5
Mechanical Drawing (C. E. 107)	3	
The Mineral Industry (Min. 209)	1	
Descriptive Geometry (M. E. 152)		3
Mod. Eng. Prose (Eng. 91, 92)	2	1
Blacksmithing (Ind. Arts 152)		2
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Sophomore Year		
Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Phys. 101, 102)	4	4
Quantitative Analysis (Chem. 401)	5	
Methods in Gas Analysis (Chem. 417).....		1
Crystallography and Blowpipe Analysis (Geol. 111)	3	
Determinative Mineralogy (Geol. 112)		3
Plane Surveying (C. E. 232)		4
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Junior Year		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Hydraulics (I. E. 102)		3
Electrical Machinery (E. E. 401)	3	
Fuels and Metallurgy of Iron and Steel (Chem. E. 410) ..		2 $\frac{1}{2}$
General Geology (Geol. 135)	2	
Petrology (Geol. 137)		3
Fire Assaying (Chem. E. 401)	4	
Mine Surveying and Mining Land Law (Min. 212)		3
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	<hr/> 16	<hr/> 16 $\frac{1}{2}$

	Senior Year	Semester	
		1st	2nd
Metallurgical Laboratory (Chem. E. 423)		2	
Cyanidation of Ores (Chem. E. 421)		2	
Metallurgy of Lead, Copper (Chem. E. 412)			2
Mining and Power Equipment (Min. 231)		3	
Mining Methods (Min. 224)			3
Mine Economics (Min. 222)			3
Ore Dressing (Min. 251)		3	
Flotation (Min. 252)			3
Economic Geology (Geol. 182)		3	
Mining Geology (Geol. 181)			3
General Engineering Laboratory (Exp. E. 210)			2
Technical English (Eng. 141)		3	
		—	—
		16	16

The following courses are offered:

209. The Mineral Industry. An introductory course designed to give to the School of Mines student a general idea of the main features of his profession. Elementary geology occupies the first two months of the semester and is a brief discussion of the subject, the aim being to summarize the various phases that are taken up in detailed courses later. Several lectures on the ceramic industry are given and several devoted to the essentials of mining and metallurgy. This course covers the whole field of the mineral industry. A certain amount of time is spent in the study of the mineral resources of Oregon.

Freshman year; first semester; 1 credit; 2 lectures. Required of students in the School of Mines but elective to any one interested.

212. Mine Surveying and Mining Land Law. Supplementary to Plane Surveying, taken in the freshman year. Methods used in underground surveying and mine mapping, in locating and patenting claims, and in such geodetic and topographic surveying as a mining engineer is often called upon to do, are studied; facility in the practical application of these methods is imparted by actual work in the field. Considerable attention is given to the solution of the many problems involving surveying which arise in mining operations; and some time is devoted to the study of the laws regulating the location, possession, and operation of mineral deposits in the United States.

Prerequisite: C. E. 201. **Text-book:** Trumbull: "Underground Surveying."

Junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

Deposit: \$2.00.

222. Mine Economics A detail study of the cost of extracting from mines, under varying conditions, gold, silver, copper, iron, and other metal ores, as well as coal.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering.

Senior year; second semester; 3 credits; 4 recitations.

224. Mining Methods. A study of the various methods used in securing the mineral products. The subject includes methods of timbering, methods of mining, pumping, ventilation, transportation, hoisting, mine sampling and reporting, installation of machinery, and surface improvements. Presented largely through lectures and directed reference work.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering.

Senior year; second semester; 3 credits; 4 recitations.

231. Mining and Power Equipment. A study of types of haulage systems, hoists, compressors, drills, pumps, explosives, etc. It also involves a discussion of the sources of power, water, hydro-electric, steam, gas, and compressed air, together with their practical application to mining operations. The subject is presented by means of lectures supplemented by use of trade catalogues, text books, and lantern slides.

Senior year; first semester; 3 credits; 4 recitations.

251. Ore Dressing. A study of the principles and the various methods of ore concentration and the mechanical preparation of ores for metallurgical treatment. This includes crushing machinery, screens, stamp mills, classifiers, jigs, vanners, and tables. Processes such as amalgamation, magnetic separation, electrostatic concentration, etc., are also discussed.

Prerequisite: Geol. 112.

Junior year; first semester; 3 credits; 3 recitations; 1 laboratory period.

252. Flotation. A continuation of the course in Ore Dressing. The physical and chemical principles involved in flotation

are studied in the class room and the adaptability of the various oils and types of machines are investigated in the laboratory.

Prerequisite: Min. 251.

Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

299. Practical Work in Mining. Students in the School of Mines are required, before the senior year, to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course being pursued. Evidence of the nature, quality, and sufficiency of the work will be passed upon by the proper department before credit is given. While the minimum requirement is two months, it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. Insight into the technical subjects studied later, also an appreciation of their application to the conditions met in practice on a commercial scale, are thus gained.

GEOLOGY

GEORGE EDWARD GOODSPEED, Assistant Professor
GEORGE ELWIN STOWELL, Instructor.

Most of the courses in geology are designed to meet the demands of the departments in the School of Mines. Courses are also offered which are suited to the needs of students in Forestry and Agriculture. Although no degree is offered, those who desire more advanced work or are inclined toward the geologic side of mining are given the opportunity to take advanced electives in geology.

Equipment. The laboratories for geology are situated on the third floor of the Mines building and comprise a Geologic and Mining Museum, a Mineralogic laboratory and a Petrologic laboratory.

In the Museum are conveniently arranged collections of ores, minerals and rocks from every important mining camp in the State. There are also framed photographs from the various mining regions and a large scale relief map of the State. Besides the collections, there are many specimens of minerals, rocks, and fossils from numerous American localities. Geologic products are shown, such as samples of all the different grades of clay wares

and cement goods. The above collections are attractively displayed in twelve glass-top cases and sixty feet of wall case.

The Mineralogic laboratory possesses the following collections:

No. 1, the Mineral Type Collection, consisting of about 1500 characteristic and labeled specimens used by the students for the purpose of study and comparison.

No. 2, an Exhibit Collection of minerals, consisting of large and attractive specimens.

No. 3, a Working Collection of minerals, consisting of about 7000 unlabeled specimens similar to those in the Type Collection.

No. 4, a Crystal Collection, containing about 1000 natural crystal forms.

No. 5, a Crystal Model Collection, consisting of 48 large glass crystal models and about 750 smaller wooden models used by the students in the study of crystallography.

No. 6, a Blowpipe Collection, containing minerals and metals used in blowpiping.

The Petrologic laboratory contains the following collections:

No. 1, the Rock Type Collection, consisting of about 500 characteristic labeled specimens used by the student for the purpose of study.

No. 2, the Working Collection of Rocks, containing about 2000 unlabeled specimens for the use of the students in the work of petrology.

The Petrologic laboratory is also equipped with a polarizing microscope and the following collections for use in the study of petrography.

No. 1. Thirty-six mineral sections for use in petrography.

No. 2. A loaned petrographic collection of over 1200 rock specimens and their respective thin sections.

(For outline of courses containing Geology see the degree course in Mining Engineering.)

The following courses are offered:

111. Crystallography and Blowpipe Analysis. A preparation for the work in Determinative Mineralogy, only those features being emphasized which are essential for the proper understanding and determination of minerals. Instruction is imparted by lectures, textbooks, laboratory work, and individual oral quizzes. In the laboratory a student is required to become thoroughly familiar with the crystal models; later he determines the forms on several

hundred natural crystals by means of a pocket lens and contact goniometer. Blowpipe Analysis is a rapid and useful method of ascertaining all, or a part, of the elements present in minerals. The course includes practice in the use of the blowpipe and the operations ordinarily included under the term Blowpipe Analysis, experimental work upon known minerals, until facility in the application of the various tests is attained, and the analysis of a score or more of unknown substances.

Prerequisites: Chem. 100 and 101.

Sophomore year, first semester; 3 credits; 2 recitations; 3 laboratory periods.

Text: H. B. Patton: Crystallography. Butler: Handbook of Blowpipe Analysis.

Fee: \$3.00.

112. Determinative Mineralogy. About one hundred and sixty important mineral species, and many varieties of these, are studied. Emphasis is placed upon methods of classification of minerals that involve a knowledge of physical characteristics such as can be gained by visual examination and by the use of the hand lens and pocketknife. Chemical and blowpipe methods are employed only to corroborate the inferences drawn from such observations. The chief end sought is the ready recognition, in the field, of those minerals likely to be encountered in mining operations. Instruction is given by means of lectures, text-book, and laboratory work, and individual oral quizzes. Each student is expected to determine approximately two thousand specimens.

Prerequisite: Geol. 111.

Sophomore year; second semester; 3 credits; 2 recitations; 3 laboratory periods.

Text: Butler: Hand-book of Minerals.

Fee: \$3.00.

135. General Geology. A study of the composition, structure, and history of the earth and of the forces instrumental in producing or changing the surface configuration and the crustal formation. Emphasis is given to the chief processes by which the accessible rocks of the earth have been formed and evolved into their present condition. Although designed as a preparation for more special courses, the student will, however, become familiar with the more common rocks and with many of the physical laws

that govern the formation of mineral deposits for School of Mines students.

Junior year; first semester; 2 credits; 2 lectures; 1 laboratory period.

Elective in any other course; 3 credits; 2 lectures; 2 laboratory periods.

Fee: \$1.00.

137. Petrology. A general discussion of the character, mode of occurrence, and origin of rocks. Special emphasis is laid upon those phases which are of importance in mining. The course is intended to familiarize the student with the characteristics of the commoner rocks so that he may identify them with reasonable accuracy in the field.

Prerequisites: Geol. 112 and 135.

Junior year; second semester; 3 credits; 2 recitations and 2 laboratory periods.

Text: Pirsson: Rocks and Rock Minerals.

Fee: \$1.00.

139. Petrography. An advanced course in Petrology. The optical properties of the rock-forming minerals and the characteristics of the principal rock types are studied with the aid of thin sections and the polarizing microscope. Type collections with their corresponding rock sections are available, and the student has the opportunity to supplement field determinations with the exact knowledge gained through the use of the microscope. An elective course designed for those who are inclined toward the geologic side of mining and offered only to graduate and advanced students.

Prerequisite: Geol. 137.

Elective; first semester; 4 credits; 2 lectures; 3 laboratory periods.

Text: Luquer: Minerals in Rock Section.

154. Dynamic and Structural Geology. A detailed study of the geologic forces and agents and their effects. Structural features likely to be encountered in mining operations and the laws governing them are emphasized. Designed for students specializing in the geological side of mining engineering. The lectures are supplemented by numerous problems of a practical nature, special attention being given to the interpretation of geologic maps.

Prerequisites: Geol. 135 and 137.

Elective; second semester; 3 credits; 3 recitations.

155. Historical Geology. Lectures on the origin and history of the earth and the plants and animals that have inhabited it. An outline of invertebrate paleontology is presented, and the student is familiarized with the principles on which is based the determination of the age of fossiliferous rocks by means of "faunal groups," and by the recognition of characteristic species. A part of the scheduled recitation periods is utilized for laboratory work.

Prerequisites: Geol. 135 and 137.

Elective; first semester; 2 credits; 3 recitations.

156. Geology of the Igneous Rocks. A course designed for graduate or advanced students dealing with the origin of igneous rock bodies. Such subjects as magmatic differentiation, the mechanism of intrusive and extrusive action are discussed in detail and special attention given to those subjects that have an important technical bearing, contact metamorphism, magmatic waters, gaseous emanations, etc.

Prerequisite: Geol. 139.

Elective; second semester; 4 credits; 4 recitations.

Text: R. A. Daly: Igneous Rocks and Their Origin. Harker: The Natural History of Igneous Rocks.

161. Forest Geology. The characteristics of the commoner minerals, rocks, and ores. The more important structural features occurring in earth materials and the criteria for recognizing the various types of ore deposits are studied.

Prerequisites: Chem. 100 and 101.

Required in Forestry course; optional in all others; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

Fee: \$1.00.

171. Agricultural Geology. The geologic origin and nature of soils. A study is made of the commoner rocks and their alteration by weathering and decay. Lectures are given on the geology of ground waters, and on rock structures which may influence agricultural operations.

Prerequisites: Chem. 100 and 101.

Elective in the Agricultural course; junior or senior year; first semester; 3 credits; 2 lectures; 2 laboratory periods.

Fee: \$1.00.

181. Mining Geology. The principles of ore deposition. Given in the second semester of the senior year in order that all of the student's previous knowledge of geologic subjects may be

brought into use in the study of ore deposits, one of the important phases of the education of the prospective mining engineer. Mode of occurrence, origin, geologic relations, and classification of ore deposits are studied. The various type deposits as known in important mining camps are discussed. The student is required to write abstracts from the literature bearing on the subject. Considerable importance is attached to the accompanying laboratory work, which consists of mineralogic and petrologic study of rocks and ores from type deposits. A certain amount of time is devoted to a discussion of field methods, mine examination, etc.

Prerequisites: Geol. 135, 137, and 182.

Senior year; second semester; 3 credits; 3 recitations; 1 laboratory period.

Text: Lindgren: Ore Deposits.

182. Economic Geology of the Non-Metallics. A course intended to give to the student a knowledge of the economically important non-metallic substances such as coal, clay, building stone, etc. Geologic occurrence and origin are carefully studied, particularly those characteristics affecting economic value. The student is required to prepare many abstracts from current literature. Considerable time is devoted to individual industries, such as the manufacture of clay products and of Portland cement. Special attention is given to market conditions and the factors affecting them.

Prerequisites: Geol. 135, 137.

Senior year; first semester; 3 credits; 3 recitations; 1 laboratory period.

190. Field Work in Geology and Mining. Two weeks of field work given just before the end of the second semester. A not-too-distant mining district is chosen and students are afforded opportunity to do geologic mapping, mine surveying, and to secure some actual mining practice.

Prerequisite: The completed work of the junior year.

199. Practical Geology. Students in the School of Mines are required, before the senior year, to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course being pursued. Evidence of the nature, quality, and sufficiency of this work will be passed upon by the proper department before credit is given. While the minimum requirement is two months,

it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. Insight into the technical subjects studied later, also an appreciation of their application to the conditions met in practice on a commercial scale, are thus gained.

CERAMIC ENGINEERING

IRA ABRAHAM WILLIAMS, Professor

The course of instruction in Ceramic Engineering is designed to prepare young men to make intelligent search for suitable raw materials, to test them properly, and to aid in their economic exploitation and development. At the outset, therefore, ceramic students are required to take substantial courses in the basic sciences, chemistry, mathematics, physics, geology, and the preliminary engineering subjects required of other students in the School of Mines.

Work in the subjects distinctive of the course is confined to the last two years, and includes lectures and laboratory instruction and practice in the processes and methods of manufacture of ceramic wares, including, besides the commoner clay products, pottery and porcelain, and the compounding and application of glazes, enamels, cements, etc. Both the materials used and the finished articles will be studied and tested. The physical and chemical principles on which the production and value of ceramic products are based are presented thoroughly, and the student is shown that successful manufacture depends upon a full knowledge and constant application of these principles.

Equipment. The Ceramic Engineering laboratory occupies a room about 30 by 60 feet in the basement of the Mines building. There are also store and supply rooms contiguous to this laboratory. The equipment for the ceramic engineering work consists of a laboratory for ceramic chemistry and apparatus for making physical tests of clays and other ceramic materials; a complete mechanical outfit for the preparation of clays for the manufacture of brick, tile, terra-cotta, etc., and equipment for the compounding of bodies, glazes and enamels for stone- and ironware, and all of the higher grade of pottery and of porcelain products. This outfit includes a combination dry-wet-pan, pug mill, blunger, filter press, ball mills and other grinding machines, rolls, screens, potter's

wheel, and an auger machine provided with dies for side- and end-cut brick, hollow block, drain tile, and roofing tile; a hand-power screw press with dies for dry press brick and flat tile; and an electric furnace for high temperature work.

In the ceramic engineering laboratory are two kilns, a down-draft burning crude petroleum, and a Caulkins muffle pottery kiln; a steam dryer in which drying conditions can be accurately controlled; an electric and a radiation pyrometer; Seger volumeter; balances and other necessary apparatus.

A ceramic library which contains the best works in both English and foreign languages and a ceramic museum are also important features of the working equipment of the department.

DEGREE COURSES IN CERAMIC ENGINEERING

The freshman and sophomore years are identical with the first two years of the Degree Course in Mining Engineering.

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Hydraulics (I. E. 102)		3
Electrical Machinery (E. E. 402)		4
General Metallurgy (Chem. E. 411)	2½	
General Geology (Geol. 135)	1½	
Petrology (Geol. 131)		2
Ceramic Chemistry (Cer. E. 301)	3	
Ceramic Raw Materials (Cer. E. 303)	3	
Raw Materials Testing (Cer. E. 310)		2
Ceramic Calculations (Cer. E. 312)		1
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
	<hr/> 17	<hr/> 17

	Senior Year	Semester	
		1st	2nd
Technical English (Eng. 141)		3	
Power Equipment (Min. E. 231)			3
General Engineering Laboratory (Exp. E. 210).....		2	
Economic Geology (Geol. 182)		3	
Manufacture of Clay Products (Cer. E. 321)		4	
Clay Products Laboratory (Cer. E. 322).....			3
Limes and Cements (Cer. E. 326)			3
Glasses, Glazes, and Enamels (Cer. E. 323)		4	
Ceramic Engineering Laboratory (Cer. E. 324).....			2
Field Work and Report (Cer. E. 328)			1
Thesis (Cer. E. 330)			4
		16	16

The following courses are offered:

301. Ceramic Chemistry. Analysis of clays, glasses, glazes, and silicate minerals. Chemical study of fire gases.

Prerequisites: Chemistry 301, 401.

Junior year; first semester; 3 credits; 3 laboratory periods.

Deposit: \$5.00.

303. Ceramic Raw Materials. The occurrence, properties, identification, and winning of clays and other ceramic materials.

Prerequisite: Completed work of the freshman and sophomore years.

Junior year; first semester; 3 credits; 3 recitations; 3 laboratory periods.

310. Raw Materials Testing. Continuation of the laboratory work of Cer. E. 303. Lectures at intervals as required.

Prerequisites: Cer. E. 303 and Chem. Eng. 471.

Junior year; second semester; 2 credits; 2 laboratory periods.

312. Ceramic Calculations. Calculations involved in the blending of raw materials for pottery bodies, glazes, cements, etc. Practical ceramic problems.

Prerequisites: Cer. E. 303; Chem. Eng. 471.

Junior year; second semester; 1 credit; 1 recitation.

321. Manufacture of Clay Products. Principles of the manufacture of clay wares, and the equipment used in drying and burning.

Prerequisite: Completion of the first three years of the Ceramic Engineering course.

Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods.

322. Clay Products Laboratory. Continuation of the laboratory work of Ceramic Engineering 321. Lectures at intervals as required.

Prerequisite: Cer. E. 321.

Senior year; second semester; 3 credits; 3 laboratory periods.

323. Glasses, Glazes, and Enamels. Classification, production, properties, and defects. Methods of application to ceramic wares.

Prerequisites: Cer. E. 303 and 312; Chem. Eng. 471.

Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods.

Deposit: \$2.00.

324. Ceramic Laboratory. Continuation of the laboratory work of Ceramic Engineering 323. Lectures at intervals as required.

Prerequisite: Cer. E. 323.

Senior year; second semester; 2 credits; 2 laboratory periods.

Deposit: \$5.00.

326. Limes and Cements. Lime, cement, plaster and other cementing materials, and sand-lime products. Production, properties, and uses.

Prerequisites: Chem. 301 and 401.

Senior year; second semester; 3 credits; 3 recitations.

328. Field Work and Report. Visits to cement, clay, and other related industrial plants; carefully written reports.

Prerequisites: Cer. E. 322 and 326.

Senior year; second semester; 1 credit; 1 laboratory period.

330. Thesis. A careful study of some special ceramic problem.

Prerequisite: Completion of all ceramic courses offered before the second semester of the senior year.

Senior year; second semester; 4 credits; 4 laboratory periods.

Deposit: \$5.00.

399. Practical Work in Ceramics. For a description of this course, see Min. 299.

With the consent of the heads of the department interested, students may be admitted to the ceramic courses from the other departments in the School of Mines, from the School of Engineering, and the department of Art and Architecture.

CHEMICAL ENGINEERING

WILLIAM HAWES COGHILL, Professor

JOHN FULTON, Professor of General and Analytical Chemistry

The work in Chemical Engineering is given jointly in the School of Mines and Department of Chemistry. The course is intended to provide the instruction and training required by young men who desire to engage in the manufacture of those substances involving chemical processes and manipulations in their production.

Industries of this nature are so numerous and various that it is impossible to familiarize a student with all of them. The course is accordingly so presented as to give in the first half a thorough knowledge of all the fundamental engineering subjects and chemical processes, while the latter half is largely elective. This enables a student to specialize along chosen branches of chemical activity.

Throughout the work in this department, special attention is given to those industries that already exist in Oregon, or that must be put into operation if the resources of the State are to be properly developed.

DEGREE COURSES IN CHEMICAL ENGINEERING

Freshman and sophomore years are identical with the freshman and sophomore years of the Degree Course in Mining Engineering.

	Semester	
	1st	2nd
Junior Year.		
Statics and Dynamics (M. E. 251)	5	
Strength of Materials (M. E. 252)		3
Hydraulics (I. E. 102)		3
Electrical Machinery (E. E. 402)		4
Physical Chemistry (Chem. 410).....	3	
Organic Chemistry (Chem. 201)	4	3
Thermochemistry (Chem. E. 452)		3
Chemical and Metallurgical Processes (Chem. E. 431).....	3	
Drill (Military 5, 6)	1	1
Military Science (Theo. Inst. 1, 2)	1	1
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	17	18

	Semester	
	1st	2nd
Senior Year.		
Chemical Technology (Chem. E. 461, 462)	4	4
Electro-chemistry (Chem. 406)	3	
Electro-metallurgy (Chem. E. 442)		2
*Approved Electives	9	9
	—	—
	16	16

401. Fire Assaying. The crushing and sampling of ores and their assay for gold, silver, and lead; also the assay of various metallurgical products such as bullion, matte, etc. Special attention is given to the principles of the subject, which is treated from a scientific and rational point of view, rather than by "rule of thumb." Each student is required to make a large number of assays upon previously sampled and assayed pulps, and to learn to check these within very close limits.

Prerequisites: Chem. 301, 401; Geol. 112.

Junior year of Mining Engineering course; first semester; 4 credits; 2 recitations; 2 half days in the laboratory.

Text: Fulton: Manual of Fire Assaying.

Fee: \$7.50.

410. Fuels, Metallurgy of Iron and Steel. The metallurgical principles and processes involved in the preparation and use of fuels and refractory materials. The art and science of the smelting of iron ore and the manufacture and properties of steel are studied by lectures and use of an approved textbook.

Prerequisites: Chem. 301 and 401; Physics 101 and 102.

Junior year; second semester; 2½ credits; 4 recitations.

412. Metallurgy of Lead and Copper. A detailed study of the furnaces, appliances, operations, and materials used in the extraction of these metals from their ores, and in refining them. Particular attention is given to the important principles underlying these processes.

Prerequisite: Chem. Eng. 411.

Senior year of Mining Engineering course; second semester; 2 credits; 3 recitations.

* Elective courses may be chosen in the departments of Physics and Chemistry, and the Schools of Engineering, Forestry, and Mines, upon the approval of the Dean of the School of Mines and the heads of the other departments or schools concerned.

421. Cyanidation of Ores. The cyanide process of extracting gold and silver from ores. The chemical principles involved in solution and precipitation are first mastered; then the operations and many mechanical devices in use are studied. Catalogues of leading manufacturers are freely used to illustrate the latest appliances.

Prerequisites: Chem. 301; Chem. Eng. 401.

Senior year of Mining Engineering course; first semester; 2 credits; 3 recitations.

423. Metallurgical Laboratory. Each student determines by laboratory tests the fitness of a given ore for cyanide treatment; ascertains the percentage of extraction by various methods; and finally, studies costs and selects the process that should give the greatest net returns.

Prerequisite: Must be taken in conjunction with, or after the completion of, Chem. Eng. 421.

Senior year of Mining Engineering course; first semester; 2 credits; 2 laboratory periods.

Deposit: \$5.00.

431. Chemical and Metallurgical Processes. Lectures supplemented by laboratory study of the general operations common to many industries, such as crushing, grinding, lixivation, filtration, evaporation, distillation, crystallization, etc., as well as the details of the various types of apparatus used for carrying on these processes.

Prerequisites: Chem. 301, 401.

Junior year; first semester; 3 credits; 4 recitations; 1 laboratory period.

442. Electro-Metallurgy. A laboratory and lecture course in which are studied the principles and processes involved in those industries which require the use of the electric current in producing and refining metals.

Prerequisite: Chem. 406.

Senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

452. Thermo-Chemistry. A continuation of Physical Chemistry in which the influence of temperature upon chemical reaction is studied more specifically than in the earlier course.

Prerequisite: Chem. 410.

Junior year; second semester; 4 recitations; 1 laboratory period.

461. Chemical Technology. A lecture and laboratory course in which the more important chemical industries are studied in detail. Various problems connected with such industries are worked out by the student in the laboratory.

Prerequisite: Chem. Eng. 431.

Senior year; first semester; 4 credits; 4 recitations; 2 laboratory periods.

462. Chemical Technology. A continuation of Chem. Eng. 461.

Prerequisite: Chem. Eng. 461.

Senior year; second semester; 4 credits; 4 recitations; 2 laboratory periods.

499. Practical Work in Chemical Engineering. For a description of this course, see Min. 299.

PHARMACY

ADOLPH ZIEFLE, Professor
IRWIN LEONARD BETZEL, Instructor

Success in Pharmacy depends to a great extent on what preparation one makes for his work in the formation of correct habits of economy coupled with industry. The importance of a scientific training in pharmacy cannot be overestimated. This is true both as regards the pharmacist and the public, for the dispenser of medicines must be held responsible for the purity and strength of his preparations. The necessary education for conducting a modern pharmacy cannot be secured in a drug store alone, however valuable the experience gained therein may be. It is clearly evident that suitable preparation for the life-work of the practical pharmacist can only be given to one who has the necessary practical experience, as well as the proper educational training.

State boards of pharmacy, recognizing the importance of scientific pharmaceutical training, are requiring it in addition to a definite amount of practical drug-store experience as a prerequisite for registration.

Of late years the demand for educated pharmacists has been more urgent than ever before, on account of the enactment of State and National Pure Food and Drug Laws, as well as other laws that regulate the sale of medicinal substances. For these reasons, it is necessary that pharmacists adjust themselves to public sentiment, which expects pure drugs and medicines and competent persons to manufacture and dispense them. These requirements can only be attained through pharmaceutical education.

The necessary knowledge of the sciences on which the art of pharmacy is based and the technical skill required to practice that art, are best acquired in a well-equipped school of pharmacy. From the fact that very little teaching is done in drug stores, it becomes necessary for the successful pharmacist to have college training in order accurately to prepare medicines and dispense prescriptions. Aside from this, it often becomes necessary to identify drugs, detect accidental poisoning and to determine whether drugs are fit to be used in prescription work.

It is this kind of training that the Department of Pharmacy at the Oregon Agricultural College is prepared to give. The depart-

ment is conveniently located in Science Hall and the eight rooms that are used for instruction in the strictly pharmacy subjects are very well equipped to give the proper instruction. The courses in pharmaceutical chemistry are given by the department of Chemistry which is also located in Science Hall.

One of the main objects of all young pharmacists is to pass a creditable examination before the State Board of Pharmacy. Preparation for such examinations is a special feature of the work of the department and its graduates have been most successful. Aside from enabling students to pass the pharmacy examination, however, the aim of the department is to afford an opportunity to obtain a thorough technical training that will equip the student for a life of efficient service in the profession of pharmacy from the practical point of view.

The courses of study meet the highest requirements of pharmaceutical instruction. The facilities for work are such that students who are interested can become most proficient in the manufacture and dispensing of drugs. The time spent in scientific pharmaceutical training will result beneficially for the people and to the profession of medicine in which pharmacy occupies a separate and distinct field.

Since the pharmacy curriculum requires more chemistry than any other course in the College, it is possible for students in pharmacy and special students to major in chemistry by electing the course in preparation for any position they have in mind. Graduates are constantly being sought by retail pharmacists as prescription dispensers, by manufacturing and wholesale druggists, by departments executing Federal and State Pure Food and Drug Laws, where they serve as chemists and inspectors.

Oregon is especially adapted to the cultivation of medicinal plants and it is only a question of time when the growing of drugs will prove to be a commercial enterprise for the State. The department of Pharmacy is especially fortunate in being able to give instruction along the line of drug cultivation. This is one of the features of the course in Pharmacognosy, a course in which students are taught to identify, cultivate, preserve, and understand all vegetable drugs.

A two-years course leading to the degree of Graduate in Pharmacy (Ph. G.) is offered, comprising the more professional studies of the curriculum. It prepares directly for drug-store and dispensing practice and provides a groundwork in analytical chem-

istry necessary for the drug business and the various phases of pharmaceutical manufacturing.

A four-years course is academic and professional, leading to the degree of Bachelor of Science (B. S.) This is the most satisfactory course to elect, because it gives a broad collegiate training supplemented with the professional work of the two-years course. This course also includes thorough work in Bacteriology, Zoology, Botany, Food and Drug Chemistry, and Physiological Chemistry. Many students who have completed the work of this degree have continued their study in schools of medicine. The entrance requirements for the above courses are the same as for other degree courses of the College.

In addition to the above courses there is offered, for the benefit of students who are not graduates of a four-years high school, a vocational course in pharmacy. This course contains but few strictly cultural subjects, but deals with all phases of Chemistry, Materia Medica, Prescription dispensing, and Chemistry. The aim of the course is to give the student the greatest amount of practical training, in the short time allowed, in order to fit him for the examinations of the State Board of Pharmacy, and at the same time assist him in becoming a more expert and efficient pharmacist. The requirements for this course are two years of high school training or its equivalent. This course extends over two years of nine months each. Upon completion of the prescribed work, the student will receive a certificate.

Students not candidates for a degree may enter this department as special students. The admission of special students is permitted after consultation with and upon recommendation of the Registrar or the professor in charge.

Students preparing to study Chemistry, Dentistry or allied subjects will find the course in Pharmacy especially well adapted for entrance to professional schools. Arrangements can be made whereby the student may elect such courses from the curriculum as are necessary to meet certain requirements.

Admission of advanced students: Students entering from collegiate departments of other colleges and universities must bring a certificate of honorable dismissal. Upon presentation of the proper credentials they will receive advanced credit for courses taken in institutions whose entrance requirements and character of work are equivalent to those of this department.

Equipment. The department's lecture rooms and laboratories are in Science Hall, a building which conveniently meets the needs for space, light, and ventilation.

The laboratories and lecture rooms are well equipped with all requirements necessary for practical instruction in pharmaceutical manipulation. Each laboratory is thoroughly equipped for a definite kind of work and the stock of the department is so complete that students have every opportunity to do efficient work. Students have individual desks supplied with a complete set of apparatus. Nearly all stock used by students is found on side shelves directly in the laboratory. All drugs not found on side shelves are obtained from the stock which is in charge of an assistant at all times during laboratory periods. This system for the distribution of drugs and apparatus to students works for the highest efficiency. Much of the student's time is saved thereby.

In addition to the usual permanent fixtures and apparatus for individual students, the department is supplied with a number of pieces of special apparatus for common use, such as pharmaceutical stills, tablet and pill machines, suppository machines, filter presses, and all of the apparatus that is necessary for thorough instruction in pharmacy. The prescription room is really a model drug store, containing accurate balances, capsule fillers, conceal molds and such other apparatus as is necessary. The room for commercial pharmacy is equipped for sign-card painting and window dressing. Special tables for frames have been built for the work and each desk is supplied with compressed air for work with the air brush. The pharmacognosy room contains many cabinets filled with crude drugs, active principles, and many preparations. There is also the Eli Lilly & Co. exhibit of authentic crude drugs and preparations.

The pharmacy library contains the leading pharmaceutical journals, which are kept on file and are accessible to students. Students also have access, with certain restrictions, to all standard reference books on materia medica, chemistry, and pharmacy.

TWO-YEARS COURSE IN PHARMACY*

	Semester	
	1st	2nd
First Year.		
General Chemistry (Chem. 105, 106)	5	2
Qualitative Analysis (Chem. 300)		3
Pharmaceutical Latin (Phar. 104)	2	
Inorganic Pharmacy (Phar. 121)	3	
Pharmacognosy (Phar. 130, 131)	3	2
Theoretical Pharmacy (Phar. 116)	3	
Practical Pharmacy (Phar. 117)		3
Pharmaceutical Preparations (Phar. 118)		2
Pharmaceutical Calculations (Phar. 123)		2
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Elective		2
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Second Year.

Organic Chemistry (Chem. 200, 201)	3	3
Materia Medica and Toxicology (Phar. 140, 141)	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115)	3	3
Prescription Lectures (Phar. 150)	3	
Prescription Incompatibilities (Phar. 151)		3
Prescription Compounding (Phar. 152)		2
Manufacturing Pharmacy (Phar. 170)	2	
Alkaloidal Testing (Chem. 404)	2	
Drill (Military 3, 4)	1	1
Electives		2
	<hr/>	<hr/>
	17	17

* This course leads to the degree of Graduate in Pharmacy. Students entering the course must have completed the full four-years high school training.

VOCATIONAL COURSE IN PHARMACY*

	Semester	
	1st	2nd
First Year.		
General Chemistry (Chem. 10, 11)	3	3
General Pharmacy (Phar. C)	4	
Inorganic Drugs (Phar. G)	4	
Elementary Pharmacognosy (Phar. K)	4	
General Pharmacy (Phar. D)		4
Pharmaceutical Arithmetic (Phar. I)		3
Pharmacognosy (Phar. L)		3
Galenical Pharmacy (Phar. E.)		2
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	16 $\frac{1}{2}$	16 $\frac{1}{2}$

Second Year.

Organic Chemistry (Chem. 200)	4	
Pharmacopoeia and National Formulary (Phar. A, B)....	4	3
Therapeutics and Toxicology (Phar. M, N)	3	3
Prescription Reading and Dispensing (Phar. O).....	3	
Advanced Galenical Preparations (Phar. F)	2	
Prescription Incompatibilities (Phar. Q).....		3
Commercial Pharmacy (Phar. 160)		3
Dispensing Pharmacy (Phar. S)		2
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4)	1	1
Electives		2
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

* Entrance to this course requires two years of high-school preparation.

DEGREE COURSE IN PHARMACY

	Semester	
	1st	2nd
Freshman Year.		
Modern English Prose (Eng. 81, 82)	3	3
General Chemistry (Chem. 105, 106)	5	2
Qualitative Analysis (Chem. 300)		3
General Zoology (Zool. 101, 102)	3	3
Pharmaceutical Botany (Bot. 70, 71)	3	4
Elementary Pharmacy (Phar. 102, 103)	1	1
Drill (Military 1, 2)	1	1
Gymnasium (Phys. Ed. 15, 16)	$\frac{1}{2}$	$\frac{1}{2}$
Library Practice (Libr. 1)	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10)	$\frac{1}{2}$	
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Sophomore Year.		
Organic Chemistry (Chem. 200, 201)	3	3
Quantitative Analysis (Chem. 400)	4	
Zoology (Zool. 201, 202)	3	3
Pharmaceutical Latin (Phar. 104)	2	
Modern Language (French, German or Spanish)	3	3
Principles of Economics (Com. 210)		3
Commercial Law (Com. 306)		3
Drill (Military 3, 4)	1	1
Gymnasium (Phys. Ed. 17, 18)	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Junior Year.		
Theoretical Pharmacy (Phar. 116)	3	
Bacteriology (Bact. 201, 202)	3	3
Modern Language	3	3
Practical Pharmacy (Phar. 117)		3
Pharmaceutical Preparations (Phar. 118)		2
Pharmacognosy (Phar. 130, 131)	3	2
Inorganic Pharmacy (Phar. 121)	3	
Alkaloidal Testing, Drug Assaying (Chem. 401, 405).....	2	2
Pharmaceutical Calculations (Phar. 123)		2
Drill (Military 5, 6)	1	1
	<hr/> 18	<hr/> 18

	Semester	
	1st	2nd
Senior Year.		
Composition of Addresses (Eng. 103, 104)	2	2
Materia Medica and Toxicology (Phar. 140, 141).....	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115)	3	3
Food and Drug Analysis (Chem. 304).....	3	
Prescription Lectures (Phar. 150)	3	
Prescription Incompatibilities (Phar. 151)		3
Prescription Compounding (Phar. 152).....		2
Manufacturing Pharmacy (Phar. 170)	2	
Physiological Chemistry (Chem. 409)		3
	16	16

The following descriptions are for the strictly pharmacy subjects, all courses in pharmaceutical chemistry are outlined in the chemistry schedule.

The following courses are offered:

102. Elementary Pharmacy. This course deals with: history of pharmacy and its development, standard pharmaceutical literature, demonstration of apparatus, and all other elementary phases of pharmacy. The aim of the course is to give new students an idea of the subject by showing the relation of the various scientific courses in the pharmacy curriculum to each other.

Freshman year; first semester; 1 credit; 1 lecture.

Text: Stevens: Pharmacy.

103. Elementary Pharmacy. A continuation of course 102 but deals with more advanced subjects in preparation for the courses in Pharmaceutical Latin and Theoretical Pharmacy.

Prerequisite: Phar. 102.

Freshman year; second semester; 1 credit; 1 lecture.

Text: Stevens: Pharmacy.

104. Pharmaceutical Latin. Latin is the language of science and all properly trained pharmacists need some knowledge of the principles of Latin etymology and construction in order to understand the use and terminology of pharmacy and medicine. The following subjects are made the basis of systematic study in this course: Latin abbreviations as used by physicians, Latin endings of drugs and medicines, prescription Latin, and English translation of all Latin terms used in pharmacy.

Sophomore year; first semester; 2 credits; 2 recitations.

Text: Strumer's: Pharmaceutical Latin.

114. United States Pharmacopoeia and National Formulary.

The object of this course is to apply the principles of all fundamental scientific courses such as, chemistry, materia medica, pharmacognosy, etc., to the subject of pharmacy. The Pharmacopoeias, Dispensatories and National Formulary are the text books used, and students are required to become very well informed as to the composition, uses, and methods of preparation of all official and unofficial remedies, as well as those newer remedies that are used most frequently. All strictly pharmacy courses are reviewed in preparation for the State Board of Pharmacy examination. Several intermediate examinations will be held, and the instructors will thus be enabled, by returning proper suggestions and directions, to aid students materially in equipping themselves for any pharmacy examination. Typical representative State Board questions will be used as a guide in preparing for the examination. There will be frequent reviews in identification of drugs and their preparations, as well as the careful systematization of all pharmacy subjects to permit of frequent reviews.

Prerequisites: Phar. 117, 118, Chem. 300, 200, 201.

Senior year; first semester; 3 credits; 3 recitations.

Texts: U. S. Pharmacopoeia and National Formulary.

115. United States Pharmacopoeia and National Formulary.

This is a continuation of course 114. As a special feature of the work, however, all scientific journals and state bulletins are reviewed, in order to familiarize students with the trend of State and National Pure Food and Drug work, as well as the various laws regarding the sale of drugs. The newer remedies are studied from the point of view of their composition, use, and incompatibilities. Other subjects of equal importance are discussed, the aim of the work being to prepare students for the actual needs in pharmacy.

Prerequisite: Phar. 114.

Senior year; second semester; 3 credits; 3 recitations.

Texts: U. S. Pharmacopoeia and National Formulary.

116. Theoretical Pharmacy. This course will begin with lectures defining pharmacy and allied sciences, and will embrace a study of the nomenclature of Pharmacopoeias and their importance as standard for drugs. Then will follow in order, lectures and demonstrations dealing with the principal processes employed in operative pharmacy; viz., weights and measures, heat, distillation,

sublimation, extraction in its various forms, and other methods used in the manufacture of galenical preparations.

Prerequisites: Registration in Chem. 105 and Phar. 130.

Junior year; first semester; 3 credits; 3 recitations.

Text: Caspari: Treatise on Pharmacy.

117. Practical Pharmacy. The natural products used in pharmacy are carefully defined and demonstrated. Then follows a study of the various classes of preparations such as: waters, syrups, tinctures, extracts, etc. Each class is defined and the various methods used in their preparation are illustrated and discussed. All preparations of the U. S. Pharmacopoeia are studied, particular attention being given to their constituents, percentage strength, method of preparation and reasons for each step, equations and synonyms.

Prerequisites: Phar. 116, Chem. 105.

Junior year; second semester; 3 credits; 3 recitations.

Texts: Caspari: Treatise on Pharmacy and Ruddiman's Why's in Pharmacy.

118. Pharmaceutical Preparations. The object of this course is to teach students to put into practice the principles of Theoretical Pharmacy. While the student's work is individual, constant supervision of the instructor prevents inaccuracies and error in conception, and in this way wrong methods can be corrected. The work will embrace the determination of specific gravities by various methods, comparison of weights and measures, standardization of graduates and the tying and wrapping of carefully weighed packages. The main feature of the course, however, is accurately to prepare small amounts of the simpler preparations such as: waters, liquors, emulsions, pills, suppositories, etc.

The galenicals made are carefully inspected and at definite times identification examinations are held, at which time students are required to identify all preparations made and all ingredients used in their manufacture.

Prerequisites: Registration in Phar. 117 and Chem. 105.

Junior year; second semester; 2 credits; 2 three-hour laboratory periods.

Text: U. S. Pharmacopoeia.

Fee: \$6.00. Deposit: \$1.00.

121. Inorganic Pharmacy. This course deals with a study of official and unofficial inorganic drugs. The lecture work consists

of a study of the elements and their compounds that are used in medicine. Their source, method of preparation, formulae, synonyms, physical and chemical characteristics are made the basis of systematic study. In the laboratory representative samples of each type of chemical will be made and samples of all official inorganic drugs will be supplied to each student for identification study.

Prerequisites: Registration in Phar. 116 and Chem. 105.

Junior year; first semester; 3 credits; two lectures and two two-hour laboratory periods.

Text: Caspari: Treatise on Pharmacy.

Fee: \$3.00.

123. Pharmaceutical Calculations. The various forms of calculations that are common to pharmacy are made the subject of systematic study; viz., Equivalents of each system of weights and measures, calculation of proportionate parts of a formula, percentage solutions, specific gravity, alligation, and such chemical calculations as are met with in pharmacy.

Prerequisites: Phar. 116, Chem. 105.

Junior year; second semester; 2 credits; 2 recitations.

Text: Stevens: Pharmaceutical Arithmetic.

130. Pharmacognosy. This course deals with the macroscopical examination and study of official and unofficial animal and vegetable drugs. All drugs are properly classified in respect to their habitat, botanical order, constituent, synonyms, medicinal uses, and preservation. Frequent identification examinations are given so that students must become thoroughly familiar with the physical characters of drugs as well as their use.

Prerequisites: Registration in Phar. 104, 121, 116.

Junior year; first semester; 3 credits; 3 recitations.

Texts: Culbreth: Materia Medica; Schlotterbeck: Syllabus; Lilly: Organic Drugs.

Fee: \$1.00.

131. Pharmacognosy. A continuation of course 130 and the use of typical State Board of Pharmacy questions to supplement the work in preparing to become registered pharmacists. A special feature of the work of this course is the instruction of growing drugs on a commercial scale. Lectures and demonstrations will be given on preparation of soil, planting of seed, the care of drug plants, collection and preparation for market.

Prerequisite: Phar. 130.

Junior year; second semester; 2 credits; 2 recitations.

Texts: Culbreth: *Materia Medica*; Schlotterbeck: *Syllabus*;

Lilly: *Organic Drugs*.

Fee: \$1.00.

140. Materia Medica and Toxicology. Lectures and recitations on the properties, physiological actions, uses, and doses of all chemical, animal, and vegetable drugs, and their preparations. The different types of drugs are studied in groups according to their physiological action. The peculiar terms used to classify drugs according to their action and uses are carefully defined. The subject of toxicology receives especial attention from the point of view of absorption, elimination, and cumulative action of poisonous substances. The signs and symptoms are studied in each case, and the antidote and medicinal treatment receive attention.

Prerequisites: Phar. 117, 118 and Chem. 200, 201.

Senior year; first semester; 3 credits; 3 recitations.

Texts: Tyrode: *Pharmacology*; Stearns: *Dose Book*.

Fee: \$1.00.

141. Materia Medica and Toxicology. A continuation of course 140. After the entire subject has been covered, preparation for the State Board of Pharmacy examination and the practical use of the subject follows. Each student will be required to familiarize himself with State pharmacy and drug laws, as well as other laws that regulate the manufacture and sale of drugs. The latter part of the course consists of lectures and laboratory work on First Aid to the Injured. Pharmaceutical jurisprudence is considered from the point of view of the trend of recent legislation affecting pharmacists, legal limits of pharmacy, liability of the seller of drugs, expert witness and all other phases of this subject.

Prerequisite: Phar. 140.

Senior year; second semester; 3 credits; 3 recitations.

Texts: Tyrode: *Pharmacology*; Stearns: *Dose Book*.

Fee: \$1.00.

150. Prescription Lectures. This course deals with the technical study of all phases of the prescription. It embraces particularly the very important subject of pharmaceutical, chemical, and therapeutical incompatibilities. The aim of the course is to give

such theoretical instruction as will enable the student to devise the best method of compounding prescriptions in order that the mixture will be safe and represent what the physician wants. Each class of prescription is studied, particular attention being given to the art of preparing elegant remedies. Ambiguous prescriptions are read in class, and the question of overdose of such drugs that might prove to be poisonous is also studied.

Prerequisites: Phar. 117, 118; Chem. 300, 200, 201.

Senior year; first semester; 3 credits; 3 recitations.

Text: Scoville: Art of Compounding.

151. Prescription Incompatibilities. This is a continuation of course 150, the chief subject being that of incompatibilities. Several hundred different prescriptions are studied from the point of view of compounding the various ingredients of remedies in the best sequence. The literature is carefully abstracted in order that students may become familiar with the manner of compounding the newer remedies that are not found in Pharmacopoeias. The aim of the work of this course is to teach students to detect dangerous prescriptions and to overcome incompatibilities.

Prerequisite: Phar. 150.

Senior year; second semester; 3 credits; 3 recitations.

Text: Ruddiman's Incompatibilities in Prescriptions.

Fee: \$6.00. Deposit: \$1.00.

152. Prescription Compounding. In this course students are expected to apply the principles of Prescription Lectures to the actual compounding of prescriptions. Many difficult and obscure prescriptions are submitted to students, who are called upon to deal with them as they deem best. In this way their ability as well as their knowledge is tested and if not accurate is corrected at once. The work of this course also deals with all the details of managing the prescription counter. The latter part of the course deals with perfecting of formulas for toilet preparations. Instruction is also given in the repair and making of mirrors, repair of apparatus, and other necessary operations common to a pharmacy.

Prerequisites: Phar. 150, 151; Chem. 200, 201, 300.

Senior year; second semester; 2 credits; 2 three-hour laboratory periods.

Text: Scoville: Art of Compounding.

160. Commercial Pharmacy. The aim of this course is to give students an idea of the requirements of an efficient manager of a pharmacy. Regular topics relating to the commercial phase of pharmacy are discussed, such as planning and arrangement of a pharmacy, keeping up stock, salesmanship, window trimming, etc. A special feature of the course is the work in sign-card painting including extensive work with the air brush. For students not registered in the department the work is exclusively sign-card painting.

Elective; first semester; 3 credits; 1 recitation and two laboratory periods.

Fee: \$3.50.

161. Commercial Pharmacy. A continuation of course 160 with the added feature of taking of inventory, price lists, study of druggists sundries, side lines and air brush work. At definite times during the course successful business men will deliver lectures on the commercial side of pharmacy.

Elective; second semester; 3 credits; 1 recitation; 2 laboratory periods.

Fee: \$3.50.

170. Manufacturing Pharmacy. This course is a continuation of the course on Pharmaceutical Preparations and deals with the manufacture of the more difficult pharmaceuticals that involve chemical reactions. The work is most exacting and requires a thorough knowledge of chemistry. As examples of the kind of preparations made, the following are mentioned; viz., spirits of nitrous ether, iodoform, ferrous iodide preparations, etc.

Prerequisites: Phar. 117, 118.

Senior year; first semester; 2 credits; 2 three-hour laboratory periods.

Text: U. S. Pharmacopoeia.

Fee: \$6.00. Deposit: \$1.00.

VOCATIONAL COURSES

A. Pharmacopeia and National Formulary. The object of this course is carefully to study all official drugs and preparations as found in the U. S. Pharmacopoeia. Particular attention is given to their source, method of preparation, composition, percentage strength, etc. The same plan will be followed in the study of the more important preparations of the National Formulary. All

work of this course is a review of the application of the principles of pharmacy and chemistry to all important official and unofficial drugs.

Prerequisites: Phar. D, E, and Chem. 11.

Second year; first semester; 4 credits; 4 lectures and recitations.

Texts: U. S. Pharmacopoeia; National Formulary.

B. Pharmacopoeia and National Formulary. A continuation of course 214. As a special feature of this course store management will be made the subject of systematic study. This will include arrangement, location, advertisement, inventory, financing, etc.

Prerequisite: Phar. A.

Second year; second semester; 3 credits; 3 recitations.

Texts: U. S. Pharmacopoeia; National Formulary.

C. General Pharmacy. This beginning course in pharmacy includes a study of the theoretical phases of the subject. The work will commence with lectures defining Pharmacy and all sciences which contribute information relative to drugs. Then follows a discussion of metrology, heat, comminution, extraction, etc., the object being to give students a thorough training, by lecture and demonstration, of all processes and apparatus used in drug preparation.

Prerequisites: Registration in Phar. G, K, and in Chem. 10.

First year; first semester; 4 credits; 4 lectures and recitations.

Text: Caspari: Treatise on Pharmacy.

D. General Pharmacy. This course deals with extemporaneous pharmacy or the application of the theory of pharmacy in preparing the various types of galenicals. The first part of the course deals with a study of the natural products used in pharmacy, then follows a study of each class of preparations, particular attention being given to the modes of preparation, preservation, and classification. The latter part of the course is devoted to the study of the official preparations found in the U. S. Pharmacopoeia.

Prerequisites: Phar. C; Chem. 10.

First year; second semester; 4 credits; 4 lectures and recitations.

Texts: Caspari: Treatise on Pharmacy; Ruddiman: Why's in Pharmacy.

E. Galenical Preparations. The object in view in this course is to teach students to put into practice in the laboratory the

principles of pharmaceutical manipulation taught in the lecture room. The course begins with a practice in the use and comparison of the various systems of weights and measures, specific gravity determinations, etc. Then follows the preparation of the simpler official and unofficial preparations. In this course students reach the point where each is competent to prepare such pharmaceutical preparations as are in common use.

Prerequisites: Phar. C, G and Chem. 10.

Second year; second semester; 2 credits; 2 laboratory periods.

Texts: U. S. Pharmacopoeia; National Formulary; Laboratory

Notes.

Fee: \$6.00. Deposit: \$1.00.

F. Advanced Galenical Pharmacy. This is a continuation of the course in galenical preparations and deals with the preparation of the more complicated pharmaceuticals, especially those involving chemical reactions. As a special feature of the work frequent identification examinations will be held on over 1000 different drugs and preparations. This is a decided advantage to the student because he becomes quite familiar with the physical characters of drugs and preparations, especially those of a poisonous nature.

Prerequisites: Phar. E, G and Chem. 11 and 200.

Second year; first semester; 2 credits; 2 laboratory periods.

Texts: U. S. Pharmacopoeia; National Formulary; Laboratory Notes.

Fee: \$6.00. Deposit: \$1.00.

G. Inorganic Drugs. Lectures and demonstrations on the manufacture, composition, purity rubric, preservation, and identification of all inorganic drugs. In the laboratory representative samples of each compound will be prepared and tested according to the U. S. P. requirements. Each student will be given a sample of each of the more important inorganic salts for identification purposes.

Prerequisites: Registration in Phar. C and in Chem. 10.

First semester; 4 credits; 3 lectures; 2 two-hour laboratory periods.

Texts: Caspari: Pharmacy and Laboratory Notes.

Fee: \$3.00.

I. Pharmaceutical Arithmetic. The various forms of calculations common to pharmacy and chemistry are made the subject of systematic study. Upon completion of this course students are

capable of solving all mathematical problems common to a pharmacy.

Prerequisites: Phar. C and Chem. 10.

First year; second semester; 3 credits; 3 lectures.

Text: Stevens: Pharmaceutical Arithmetic.

K. Elementary Pharmacognosy. Crude vegetable and animal drugs are studied from the point of view of their official definition, constituents, habitat, synonyms, means of identification, etc. The student has access to the crude drug laboratories at all times, where typical specimens of all drugs and preparations are on display. This is an important feature of the work, because the best pharmacist is the one who can recognize the characteristics of crude drugs and preparations and thereby avoid serious error in compounding.

Prerequisites: Registration in Phar. C, G and in Chem. 10.

First year; first semester; 4 credits; 4 lectures.

Texts: Lilly: Organic Drugs; Schlotterbeck: Syllabus.

Fee: \$1.00.

L. Pharmacognosy. A continuation of course 230. During the latter part of the course typical State Board of Pharmacy questions will be used in preparation for the State examination in this subject.

Prerequisite: Phar. 230.

First year; second semester; 3 credits; 3 lectures.

Texts: Lilly: Organic Drugs; Schlotterbeck: Syllabus.

Fee: \$1.00.

M. Therapeutics and Toxicology. A study of the action of chemicals, drugs, and their preparations on the human organism in health and disease, also the physiological action of the various poisons, their antidotes and emergency treatment in cases of poisoning. The peculiar terms used in medicine will be carefully defined.

Prerequisites: Phar. D, E and Chem. 11.

Second year; first semester; 3 credits; 3 lectures and recitations.

Texts: Tyrode: Pharmacology; Stearns: Dose Book.

Fee: \$1.00.

N. Therapeutics and Toxicology. A continuation of course 240 and as a special feature of the course the subject of First Aid to the Injured will be taught by elective and actual practice. Typi-

cal State Board of Pharmacy questions will also be reviewed in preparation for the State examination in this subject.

Prerequisite: Phar. M.

Second year; second semester; 3 credits; 3 lectures and recitations.

Texts: Tyrode: Pharmacology; Stearns: Dose Book; Lecture Notes.

Fee: \$1.00.

O. Prescription Reading and Dispensing. This course involves a technical study of all phases of the prescription, practical exercise at sight reading and in the art of extemporaneous compounding. The nomenclature of the prescription and prescription Latin will receive especial attention.

Prerequisite: Phar. D, E and registration in Chem. 200.

Second year; second semester; 3 credits; 3 lectures and recitations.

Text: Scoville: Art of Compounding.

Q. Prescription Incompatibilities. Lectures and recitations on the many forms of incompatibilities with the view of detecting them and thus avoiding incompatibility by scientific combination of the ingredients. Over 500 different kinds of incompatibilities will be discussed, as well as those of the newer synthetic remedies.

Prerequisites: Phar. O and Chem. 200.

Second year; second semester; 3 credits; 3 lectures.

Text: Ruddiman: Incompatibilities in Prescriptions.

Fee: \$6.00. Deposit: \$1.00.

S. Dispensing Pharmacy. This course embraces the methods of compounding the various types of prescriptions in the laboratory. The habit of neatness, accurate checking, correct pricing, and, above all, of precision acquired by students in this work, is of direct and immediate advantage to them in their life work as pharmacists.

Prerequisites: Phar. O, F and Chem. 200.

Second year; second semester; 2 credits; 2 laboratory periods.

Text: Scoville: Art of Compounding.

ART AND ARCHITECTURE

FARLEY DOTY McLOUTH, Professor
LAWRENCE EUGENE ROBINSON, Instructor in
Rural Architecture
EDNA MAY FLARIDA, Instructor
EDITH FREEMAN SHERMAN, Instructor

The department of art offers no regular courses in art with the idea of instruction in the fine arts in view, but only as art education relates to highest ideals in everyday life, and to meet the requirements of art in the industries. Courses in drawing, composition, light and shade and color are planned and given for the purpose of facilitating instruction in the applied arts courses—design, metal work, clay modeling, and the ceramic art; and in the work of such other departments as Agriculture, Domestic Art, and Industrial Arts.

The art courses offered not only develop utilitarian ideas, but they also cultivate an appreciation and love of the beautiful in nature and art.

Equipment. The department occupies three commodious, well-lighted studios on the fourth floor of Agricultural Hall, one draughting room on the second floor of the same building, a metal-working laboratory in Waldo Hall and a clay-modelling and pottery studio in the Mines building. The rooms have north light, are well heated and ventilated and are equipped with suitable studio furniture and accessories, such as casts, still life, and prints. The department is also well supplied with wall drawings, pictures, and port-folios illustrating the different phases of the work.

The College Library has a well-selected and growing reserve in art and architecture, covering all branches of the subjects.

102. Free-Hand Drawing. This course covers in representation; still life in line and dark and light; free-hand perspective of circles and linear perspective; some of the principles of composition and design; Egyptian ornament; the handling of pencil and charcoal.

The degree courses in Home Economics; freshman year; first semester; 2 credits; 2 studio periods of two hours each, and one recitation.

Fee: \$0.50.

103. Beginning Composition. The study of design principles applied to concrete problems of dress or home decoration; brush

and ink, charcoal, and pencil are used as media. Greek design is studied.

Prerequisite: Drawing 102.

The degree courses in Home Economics; freshman year, second semester; 2 credits; 2 studio periods of two hours each and one recitation.

Fee: \$0.50.

204. The Theory and Harmony of Color. This course covers the study of the so-called primary colors, the development of the prismatic colors with their complements, color quality, color values and the various harmonies. Problems in monochromatic, complementary, analogous and dominant harmonies are to be rendered. These problems will be an application of harmonious color schemes as applied to articles of household use, dress, and home interiors.

Prerequisites: Art. 102, 103.

Degree course in Home Economics; sophomore year; first semester; 2 credits; 3 studio periods of two hours each.

Fee: \$0.50.

205. Water Color. The courses in water color are offered as elective cultural subjects and are open to any student who has completed courses 102, 103, and 104, or their equivalent. The work of the first semester will include simple flat washes of geometric casts, and flat color washes of still life subjects of broad area.

First semester; 2 credits; 3 studio periods of two hours each.

Fee: \$0.50.

206. Water Color. A continuation of course 205, leaving flat washes and taking up more complex still-life studies, posters, and landscapes.

Prerequisite: Art 205.

Second semester; 2 credits; 3 studio periods of two hours each.

Fee: \$0.50.

305. Advanced Design. An elective offered to give a broader working knowledge of design principles which shall serve as a guide to selection, adaptation, and composition, both structural and decorative, for practical application in interior decoration, costume design, and for articles of personal and household use.

First semester; 2 credits; 3 studio periods of two hours each.

Prerequisites: Art 102, 103, and 104.

Fee: \$0.50.

306. Advanced Design. A continuation of course 305.

Prerequisites: Art 102, 103, 204, and 305.

Second semester; 2 credits; 3 studio periods of two hours each.

Fee: \$0.50.

411. Industrial Arts Drawing. Free-hand perspective and working sketches of wood joints, furniture, and machine parts; and drawing from written descriptions.

The degree course in Industrial Arts; freshman year; second semester; 2 credits; 3 studio periods of two hours.

M. E. Vocational course; first year; second semester; 1 credit; 3 studio periods of one hour each.

Fee: \$0.50.

412. Industrial Arts Design. A course in the principles of design suited to the Industrial Arts course. Original design plates of door and cabinet paneling, metal parts, hinges, escutcheons, draw pulls, etc., and furniture, will be required.

The degree course in Industrial Arts; sophomore year; first semester; 1 credit; 3 studio periods of one hour.

Fee: \$0.50.

413. Clay Modeling and Pottery. The study of the modeling and making of pottery occupies most of the time. Different ways of making and decorating vases will be studied, using the hand work and the potter's wheel. Modeling from nature, tile building, mold and cast making in plaster, firing and glazing.

Prerequisites: Art 102 and 103.

Elective; the degree courses in Home Economics; senior year; first semester; 2 credits; 3 studio periods of two hours each.

Fee: \$1.00.

414. Clay Modeling and Pottery. A continuation of course 413 with more advanced work and more time given to clay modeling.

Prerequisites: Art 102, 103, or their equivalents, and 413.

Elective; the degree course in Home Economics; senior year; second semester; 2 credits; 3 studio periods of two hours each.

Fee: \$1.00.

505. Water Color Rendering. The purpose of this course in water color rendering is to give a knowledge of the handling and use of the brush and color in the expression of architectural subjects, detail, and decoration.

Fee: \$0.50.

506. Water Color Rendering. A continuation of course 505, followed by full color drawings of buildings and their surroundings. Later in the semester opportunity is given for out-of door sketching in color.

Landscape Gardening; elective; sophomore year; second semester; 2 credits; 2 studio periods of three hours each.

The following courses are open to students who have had courses 102 and 103 or their equivalents and to Industrial students having courses 411 and 412 or their equivalents.

Fee: \$0.50.

600. Jewelry Making. The first semester will be given to work in jewelry-making, using copper and silver, and covering the processes of sawing, hard and soft soldering, stone setting, etching, repousse, and cuttle-bone casting.

Prerequisites: Art 102, 103, or their equivalent.

Elective; the degree course in Home Economics; or any student having the desired prerequisites; 2 credits; 6 studio periods.

Fee: \$1.00. Deposit: \$2.00.

601. Jewelry Making. A continuation of course 600, with the addition of work in hammered metal.

Prerequisites: Art 102, 103, and 600.

Elective; the degree course in Home Economics; or any student having the desired prerequisites; second semester; 2 credits; 6 studio periods.

Fee: \$1.00. Deposit: \$2.00.

602. Art Metal Work. The work of the first semester will cover the processes of piercing, etching, sinking, sawing, riveting, straight bending and repousse, in the making of such articles as desk sets, book ends, trays, ladles, bag tops, plates, hinges, corners, etc.

Industrial Arts students; 2 credits; 3 two-hour periods.

Fee: \$1.00. Deposit: \$2.00.

603. Art Metal Work. The second semester work will be largely the problems of raising, hard and soft soldering, and soft enameling, in the making of pitchers, vases, etc.

Industrial Arts students; 2 credits; 3 two-hour periods.

Fee: \$1.00. Deposit: \$2.00.

RURAL ARCHITECTURE

The courses in architecture are offered first to students in agriculture who may major in rural architecture or elect subjects pertaining to farm structures; to students in industrial arts who take house planning; to students in landscape gardening who take subjects in landscape architecture; to students in home economics who take house construction and decoration, and to all others who are interested in rural and domestic architecture and are prepared to take the subjects.

The work is especially adapted to meet the utilitarian requirements of the other departments of the College and to serve these departments in an able manner. The courses consist of problems in design and construction and a consideration of building materials.

For students of agriculture the course amounts to agricultural engineering. It is important for men who contemplate this work in agricultural colleges, who intend to develop farm establishments, who favor structural work or who themselves have buildings to erect.

The following courses are offered:

501. Architectural Drawing. In this course the student is taught the use of the drawing board, T-square, triangle, and instruments. One plate each week will be prepared for the purpose of practice in lettering, line drawing, and scale. Much attention will be given to neatness and to correct presentation.

Freshman year; first semester; 3 credits; 3 draughting room periods of three hours each.

Fee: \$0.75. Text: Bourne Von Holst-Brown: Architectural Drawing and Lettering.

502. Orders of Architecture. This is a continuation of course 501, in which the proportions of the Classic orders of architecture are studied. Diluted ink drawings rendered in water color on Whatman hot pressed paper will be presented.

Freshman year; second semester; 3 credits; 3 draughting room periods of three hours each.

The textbook will be the American Viguola, Part 1.

Fee: \$0.75.

507. Wood Construction. This course is carried on in conjunction with course 510 and has one recitation each week. Scale drawings, showing the construction of wooden buildings, de-

signed by the student will be presented periodically. The properties of wood, methods of construction, and use of building materials will be carefully studied.

Sophomore year; first semester; 2 credits; 1 recitation; 1 draughting room period.

Fee: \$0.50. Text: Kidder: Building Construction, Part II, Carpentry.

508. Masonry Construction. This course will be studied similarly to course 507 and in conjunction with course 511.

Fee: \$0.50. Text: Kidder: Building Construction, Part I, Masonry.

509. Shades and Shadows. Although shades and shadows are studied in connection with the Orders, advanced work is given using as a textbook McGoodwin's Shades and Shadows.

Sophomore year; first semester; 1 credit; 1 draughting room period.

Fee: \$0.50.

510. Rural Architecture. In this course original work in design is first offered. Problems such as bungalows, houses, and schools will be given the student for solution. Only frame buildings will be studied, and the drawings will be presented as sketches, except the structural drawings for course 507, which will be practical working drawings.

Sophomore year; first semester; 3 credits; 3 draughting room periods.

Fee: \$0.75.

511. Rural Architecture. A continuation of course 510 in which buildings of masonry are studied. Drawings will be presented formally, the design and construction being original.

Sophomore year; second semester; 3 credits; 3 draughting room periods.

Fee: \$0.75.

512. Eight Hour Problems. On one Saturday in each month, a problem in design will be assigned to the student to be worked out during the day.

Junior year; first semester; 1 credit.

Fee: \$0.50.

513. Eight Hour Problems. A continuation of course 512.

Junior year; second semester; 1 credit.

514. History of Architecture. Hamlin's History of Architecture will be thoroughly studied in this course, presenting the development of styles since prehistoric times.

Elective; first semester; 1 credit; 1 recitation period.

515. History of Architecture. A continuation of course 514.

Elective; second semester; 1 credit; 1 recitation period.

516. Domestic Planning. This course takes up house planning from the practical standpoint. The drawings will be literal and comprehensive. The site, cost, use, and everything that goes into such a building will receive due consideration.

Elective; first semester; 2 credits; 2 draughting room periods.

Fee: \$0.75.

517. Domestic Planning. A continuation of course 516.

Elective; second semester; 2 credits; 2 draughting room periods.

Fee: \$0.75.

518. Perspective Drawing. A study of mechanical perspective.

Agriculture; sophomore year; second semester; 1 credit; 1 draughting room period.

533. Agricultural Building Design. This course is for students of agriculture. Design and construction of buildings for the farm are studied. The work is individual; thus each student may elect the particular kind of buildings in which he is especially interested.

Agriculture; elective; first semester; 2 credits; 2 draughting room periods of three hours each.

Fee: \$0.50.

535. Advanced Agricultural Building Design. A continuation of course 533.

Agriculture; elective; second semester; 2 credits; 2 draughting room periods.

Fee: \$0.50.

536. Farm Plan Drawing. The work of this course is prescribed for students studying farm management. The conventional methods of indicating lines, roads, fields, etc., will be carefully presented. Howe's Agricultural Drafting will be used.

Agriculture; elective; first semester; 1 credit; 1 draughting room period.

Fee: \$0.50.

537. Farm Structures. Advanced drawing of concrete and frame structures. Details of construction, sanitation, and economics principles as advanced by other departments will receive strict attention. This course is for students who wish to specialize in agricultural engineering or rural architecture.

Prerequisites: Arch. 533 and 535.

Agriculture; elective; first semester; 4 credits; 4 draughting room periods.

Fee: \$1.00.

538. Farm Structures. A continuation of course 537.

Agriculture; elective; second semester; 4 credits; 4 draughting room periods.

Fee: \$1.00.

601. Elementary Landscape Architectural Drawing. This course takes up lettering and line drawing at the beginning and develops into the study of the presentation of garden plans. The relation of architecture to the garden will be observed in all drawings and various architectural styles will be noted. Only pen and ink drawings will be presented.

Landscape Gardening; freshman year; first semester; 3 credits; 3 draughting room periods.

Fee: \$0.75.

602. Advanced Landscape Architectural Drawing. A continuation of course 601, in which drawings will be made using water colors.

Landscape Gardening; freshman year; second semester; 3 credits; 3 draughting room periods.

Fee: \$0.75.

603. Landscape Architectural Design. Problems in the design of gardens and grounds presented not as working drawings but as rendered sketch drawings showing geometry of plan, color scheme and perspective.

Prerequisites: Arch. 601, 602 and 518.

Landscape Gardening; junior year; first semester; 3 credits; 3 draughting room periods.

Fee: \$1.00.

604. Landscape Architectural Design. A continuation of course 603.

Landscape Gardening; junior year; second semester; 3 credits; 3 draughting room periods.

Fee: \$0.75.

701. Elementary House Planning. This course consists of practical problems in planning and construction. All drawings will be working-drawings presented on detail paper. The work is prescribed for Industrial Arts students.

I. A.; junior year; first semester; 3 credits; 3 draughting room periods.

Fee: \$0.75.

702. Advanced House Planning. A continuation of course 701.

I. A.; junior year; second semester; 3 credits; 3 draughting room periods.

Fee: \$0.75.

D. A. 501. House Construction and Decoration. (See page 306, School of Home Economics.)

Fee: \$0.50.

D. A. 502. Advanced House Construction. A continuation of D. A. 501.

D. A.; elective; second semester; 2 credits; 2 draughting room periods of two hours each.

CHEMISTRY

JOHN FULTON, Professor.
HERMAN VANCE TARTAR, Associate Professor*
RENTON KIRKWOOD BRODIE, Associate Professor.
MILO REASON DAUGHTERS, Assistant Professor.
RAYMOND ADAMS DUTCHER, Instructor.
MILTON JOHN SEELEY, Instructor.
ROBERT ANDREW DUNCAN, Instructor.
RALPH FINNEY BEARD, Instructor.
SYLVESTER BOYER, Instructor.

The beginner's courses, Chemistry 100, 101, and 102, consist essentially of the proof of some of the well-known chemical laws, such as the law of conservation of matter, the law of definite proportions and of multiple proportions, the Law of Boyle, and the Law of Charles. The student attains skill in the manipulation of apparatus, and in the management of equipment in general. From this elementary work he proceeds to qualitative analysis, in the study of which he is taught to separate and identify the different elements composing the mass, and, in the case of metals, to learn of their properties, their use, the different methods of obtaining them from their ores, and the combinations in which they occur in nature.

If he has shown suitable proficiency, he advances to quantitative analysis, which is the determination of the amounts of the ingredients. He is taught both methods of analysis, volumetric, or the method by solution, and the gravimetric, or the method by precipitation and weighing. On completing these courses, the student is fairly well prepared to take up advanced chemistry, which treats of the analysis of soils, manures, cattle foods, dairy products, etc., or he can take up the subject from the inorganic side in the analysis of minerals, fuels, oils, gas, etc., or he can view it from the pharmacist's standpoint, in analyzing drugs.

The following courses are offered:

Equipment. The department of Chemistry occupies nearly the whole of Science Hall, except the fourth floor, which is occupied by the department of Pharmacy, and a few rooms on the third floor that are at present used by the School of Forestry. The Chemical department of the Experiment Station has four rooms on the second floor.

The largest room in the building is the main general laboratory, which will accommodate 550 students in four sections. Adjacent to this laboratory is the general stock room, that in itself is a

* On leave of absence 1916-17.

division of the department. It is well stocked with all the necessary apparatus and chemicals required for all the courses given in the department. One of the greatest improvements in the Chemical department is the new gas machine; this, when working at its full capacity, can supply gas for 800 burners.

The new organic laboratory has been increased in size until it now contains room for 240 students. The equipment is of the best.

The new qualitative analysis room now has accommodations for 96 students in four sections. Its equipment of hot and cold water, gas, pressure pumps, etc., makes it as good as the best.

The qualitative analysis room can accommodate 50 students in three sections. Great pains have been taken to make this room as nearly an actual chemical work room as possible.

In the balance room there are 23 analytical balances, most of which are used by the students in agricultural chemistry, and in food chemistry.

The main lecture room which is situated on the third floor, has a seating capacity of 150. It is provided with lecture tables that are supplied with gas, electricity, and water. Adjoining the lecture room is a small preparation room, in which is kept all special apparatus used for lecture demonstration, as well as supplies for the agricultural laboratory. This room is equipped with all the necessary apparatus for the proper elucidation of the principles of this branch of chemistry.

For the work in Agricultural Chemistry, an entire room is set aside. This room is fitted with gas, water, and electricity; condensers for distilled water; batteries; extraction apparatus for fats; nitrometers; Kjeldahl apparatus; hot water filtering apparatus; grinders for fodders, steam and air baths, calorimeter, polariscope, Westphal and analytical balances; coarse balance for rough work, hot-plates, and minor apparatus. This is one of the strongest divisions in the department and is lacking in nothing that makes a fully equipped agricultural chemical laboratory.

A. Elementary Chemistry. Fundamental laws of chemistry; general properties of matter; non-metallic elements and their compounds; special attention to oxidation and reduction.

Vocational students in Mechanic Arts; second year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

Text: Stansbie: Introduction to Chemistry for Technical Students.

Fee: \$3.00. Deposit: \$2.00.

B. Elementary Chemistry. Metals; their compounds; alloys; special attention to chemical behavior of metals under shop conditions.

Prerequisite: Chemistry A.

Vocational Students in Mechanic Arts; second year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

10. General Chemistry. Fundamental principles of the science; non-metallic elements and their compounds.

Prerequisites: Mathematics A and B.

Required of all students who have not had elementary chemistry in high school except those registered in the degree courses in Pharmacy, Mining, Commerce (Elective), and Landscape Gardening.

Freshman year; first semester; 3 credits; 1 lecture; 2 recitations; 2 laboratory periods.

Text: Smith: General Chemistry for College (Revised.)

Fee: \$3.00. Deposit: \$2.00.

11. General Chemistry. Non-metallic and metallic elements and their compounds. Conceptions of chemical equilibrium and the modern theory of solutions frequently applied.

Prerequisite: Chemistry 10 or its equivalent.

Freshman year; second semester; 3 credits; 1 lecture; 2 recitations; 2 laboratory periods.

Fee: \$3.00. Deposit: \$2.00.

12. Elementary Household Chemistry. A course arranged for women who do not care to take the full chemical courses leading to the degree in Home Economics. As its name implies, it is a fragmentary elementary course in the application of chemistry to daily life, rather than an exposition of chemical principles.

It treats of such subjects as the relation of combustion to heat, lights and illuminants; commercial soaps; special soaps and scouring powders; general composition of foods; functions of food; textile fibres; bleaching and bluing, etc.

First semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each.

Text: Snell: Elementary Household Chemistry.

13. A continuation of 12.

Freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each.

Courses 12 and 13 will not be accepted as substitutes for courses 100 and 101.

100. General Chemistry. Fundamental principles; non-metallic elements and their compounds.

Prerequisite: Elementary High School chemistry.

Required of all students having had chemistry in the high school (see note below) registered in the degree courses, except Pharmacy, Mining, Commerce (Elective), and Landscape Gardening.

Freshman year; first semester; 3 credits; 2 recitations or lectures; 2 laboratory periods.

Text: Smith: General Chemistry for Colleges.

Fee: \$3.00. Deposit: \$2.00.

101. General Chemistry. Non-metallic and metallic elements and their compounds. Conceptions of chemical equilibrium and the modern theory of solutions are frequently applied.

Prerequisite: Chemistry 100 or its equivalent.

Freshman year; second semester; 3 credits; 2 recitations or lectures; 2 laboratory periods.

Text same as for Chemistry 100.

Fee: \$3.00. Deposit: \$2.00.

104. Chemical Calculations. Calorimetric; specific gravity; gas calculations; calculations of atomic weights and formulas; gravimetric analysis; volumetric analysis.

Prerequisite: Quantitative analysis.

Elective; junior or senior year; first or second semester; 2 credits; 2 recitations. (Note: A minimum of 5 students required)

Text: Ashley: Chemical Calculations.

Fee: \$2.00. Deposit: \$2.00.

105. General Chemistry for Mining, Chemistry, and Pharmacy students especially, but also open to others who desire to complete General Chemistry, and Qualitative Analysis during the first year.

Freshman year; first semester; 5 credits; 3 recitations; 2 laboratory periods of three hours each.

Fee: \$5.00. Deposit: \$2.00.

NOTE—Students who have had one year of chemistry in a standard high school may be permitted to take an examination for credit in Chemistry 10 and 11 provided their high school credits are not used as entrance units. This examination will be held one week after the opening of the first semester. Laboratory note books must be presented.

106. A continuation of 105, but with this difference, that Qualitative Analysis succeeds the laboratory manual used in the first semester. This course is open to any one having completed 101, or its equivalent.

The general chemistry text is used as the basis of the recitations in this course which is really descriptive chemistry.

Freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods of three hours each.

Text: Noyes: Qualitative Analysis.

Fee: \$5.00. Deposit: \$2.00.

200. Elementary Organic Chemistry. A study of fundamental principles and more important compounds; petroleum and its products, alcohols, ethers, aldehydes, fatty acids, oils, soaps.

Prerequisite: Chemistry 11 or 101.

Course in Home Economics, and Vocational Pharmacy; sophomore year; first semester; 4 credits; 2 recitations; 3 laboratory periods.

Text: Norris: Organic Chemistry.

Fee: \$4.00. Deposit: \$2.00.

201. Organic Chemistry. Aliphatic compounds; hydrocarbons, alcohols, ethers, esters, aldehydes, acids, fats, ketones, amines, carbohydrates, alkaloids. Preparation and identification of typical and simple compounds.

Prerequisite: Chemistry 11 or 101.

Course in Pharmacy; sophomore year; and Chemical Engineering; junior year; first semester; 3 credits; 2 recitations; 2 laboratory periods.

Text: Norris: Organic Chemistry.

Fee: \$3.00. Deposit: \$2.00.

202. Organic Chemistry. Aromatic compounds; cyclic hydrocarbons, nitro derivatives, amines, diazo compounds, phenols, dyes, proteins.

Prerequisite: Chemistry 201.

Course in Pharmacy, sophomore year, and Chemical Engineering; junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods.

Text: Norris: Organic Chemistry.

Fee: \$3.00. Deposit: \$2.00.

300. Qualitative Analysis. This course consists largely of laboratory practice in the ordinary process of separating and

identifying ions. It is given in conjunction with 106, and in fact constitutes the laboratory part of the above course.

Freshman year; first semester; 3 credits; 3 laboratory periods of three hours each.

Texts: Smith: Chemistry; Noyes: Qualitative Analysis.

301. Qualitative Analysis. A course provided for Mining students who have completed 101, or equivalent.

Freshman year; first semester; 5 credits; 2 recitations and three laboratory periods of 3 hours each.

Texts: Smith: Chemistry; Noyes: Qualitative Analysis.

Fee: \$3.00. Deposit: \$2.00.

302. Qualitative Analysis. Students in Highway Engineering.

Three credits; 1 recitation; 3 laboratory periods of two hours each.

Fee: \$3.00. Deposit: \$2.00.

303. Organic Qualitative Analysis. A course for Pharmacy students.

Elective; second semester; 3 credits; 2 recitations; 2 laboratory periods of 3 hours each.

Fee: \$3.00. Deposit: \$2.00.

304. Food and Drug Analysis. This course affords suitable preparation for the students to hold positions in the Federal Food and Drug Laboratories.

The food and drug products on the market that are subject to the greatest adulteration will be analyzed for preservatives and other added materials.

Prerequisites: Organic Chemistry and Botany.

Senior year; 3 credits; 3 laboratory periods.

400. Quantitative Analysis. A course designed for students in Pharmacy, and consists of instruction in both gravimetric and volumetric analysis of pharmaceutical products.

Sophomore year; first semester; 4 credits.

Fee: \$3.00. Deposit: \$2.00.

401. Quantitative Analysis. This is a course in analysis for Mining students, and consists of gravimetric analysis of limestones, iron, lead, zinc, arsenic, and antimony ores, coal, and as much other work as time will permit.

The course in Mining Engineering; sophomore year; first semester; 5 credits; 1 recitation; 4 laboratory periods.

Text: Frank and Clemens. Fee: \$5.00. Deposit \$2.00.

402. Chemistry of Foods. A qualitative and quantitative examination of sugars, fats, proteins, leavening agents. Adulteration of foods, with simple methods of detection; food legislation.

Prerequisite: Chem. 200.

Required of all students in Home Economics; sophomore year; second semester; 4 credits; 2 recitations; 3 laboratory periods.

Texts: Leach: Food Inspection and Analysis; Olsen: Pure Foods; Sherman: Food Products; Sherman: Organic Analysis; and U. S. Bul. 107 (revised.)

Fee: \$4.00. Deposit: \$2.00.

403. Chemistry of Water. This course is especially for the students in Highway Engineering, and consists of the examination of waters for potability, and for adaptability for industrial purposes. This course is divided into two parts; first, Sanitary Water Analysis, which investigates the methods of analysis applied to water and sewage, as outlined by the American Public Health Association; second, Chemical Studies of Industrial Waters, which includes the examination of various waters with reference to their adaptability to industrial processes such as heating plants, laundries, paper mills, etc.

Junior year; second semester; 2 credits; 2 laboratory periods.

Text: Standard Methods of Water Analysis. A. P. H. A.

Fee: \$2.00. Deposit: \$2.00.

404. Alkaloidal Testing. A study of the alkaloids of the drug plants as regards their structure and synthesis. The means of their identification by the various alkaloidal tests will be studied in the laboratory as well as the means of identifying those organic compounds that enter pharmaceutical preparations. This course will also include the means of detection of the common poisons in the animal body.

Prerequisites: Chemistry 100, 101, 300, and 201.

First semester; 2 credits; 2 laboratory periods.

Fee: \$2.00. Deposit: \$2.00.

405. Drug Assaying. The quantitative estimation of the active principles of crude drugs and their preparations, such as solid and fluid extracts, tinctures, pills, etc. The assay of a number of inorganic pharmaceutical preparations will be included in this course.

Methods for the physiological standardization of drugs and drug preparations will be discussed by the instructor.

Prerequisites: Chemistry 100, 101, 300, 201, and 404.

Second semester; 2 credits; 2 laboratory periods.

Fee: \$2.00. Deposit: \$2.00.

406. Chemistry of Highway Materials. The course is designed for students in Highway Engineering, and consists of the study of such materials as cement, asphalt, bitumen, mineral oils, tar, and tar products.

The course in Highway Engineering; junior year; second semester; 2 credits; 2 laboratory periods.

407. Applied Electro-Chemistry. Applications of the electric current to analytical operations; electroplating; electrolytic oxidation and reduction; storage batteries; the electric furnace, etc.

Prerequisites: Chemistry 401 or its equivalent and Chemistry 410 and 411 or their equivalent.

Chemical Engineering; senior year; first semester; 3 credits; 1 conference; 6 to 8 hours per week in laboratory.

Text: Thompson: Applied Electro-Chemistry; Laboratory Outline of Electro-Analysis.

Fee: \$3.00. Deposit: \$2.00.

408. Chemistry for Engineers. This course is particularly for students in Mechanical and Electrical Engineering. It consists of the analysis of coal, oil, gas, and of their calorific powers; also the technical analysis of flue gases.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods.

410. Elementary Physical Chemistry. Molecular weight determinations; properties of liquids; dilute solutions; solubilities; conductivity of solutions; chemical equilibrium; velocity of reactions.

Prerequisites: Mathematics 31 and Chemistry 401 or their equivalent.

Chemical Engineering and Agricultural Chemistry; junior or senior year; 3 credits; 2 lectures and recitations; 1 laboratory period of 4 hours.

Text: Senter: Outlines of Physical Chemistry; Findlay: Practical Physical Chemistry.

Fee: \$3.00. Deposit: \$2.00.

411. Principles of Thermo-Chemistry and Electro-Chemistry. Thermochemical measurements; relation of chemical affinity to heat of reaction; conductivity of solutions; electromotive force.

Prerequisite: Chemistry 410.

Chemical Engineering and Agricultural Chemistry; junior or senior year; second semester; 3 credits; 1 conference; 6 to 8 hours per week in laboratory.

Texts: Ostwald-Luther: Physico-Chemical Messungen; Findlay: Practical Physical Chemistry; Thomsen: Thermo-chemistry; Leblanc: Electro-chemistry; Senter: Outlines of Physical Chemistry.

Fee: \$3.00. Deposit: \$2.00.

412. Metallurgical Analysis. This consists of the analysis of Metallurgical and Engineering materials, such as limestone, cement, coal, iron ore, copper matte, brass, bronze, steel, babbit metal, water, oil, etc.

The course in Chemical and Mining Engineering; sophomore year; second semester; 3 credits; 3 laboratory periods.

Text: Sidener: Quantitative Metallurgical Analysis.

Fee: \$3.00. Deposit: \$2.00.

413. Chemical Technology. A course of lectures in the principles of Organic, Analytical, and Technical Chemistry as applied to those industries depending upon chemistry as a basis for their processes.

The course in Chemical Engineering; senior year; first semester; 2 credits. A continuous course; credit will not be awarded until the second semester's work has been completed.

Fee: \$2.00. Deposit: \$2.00.

414. Chemical Technology. A continuation of course 413.

The course in Chemical Engineering; senior year; second semester; 2 credits.

Text: Thorpe: Industrial Chemistry.

Fee: \$2.00. Deposit: \$2.00.

415. Methods of Teaching Chemistry. A course designed for those who expect to teach chemistry in secondary schools. Lectures, reports, discussions. A critical study will be made of laboratory experiments, equipment, sources of materials, modern text books, and manuals.

Prerequisites: Chem. 100, 101, 200, and 402.

416. Food Industries. A critical study of cereals, breakfast foods, beverages, animal foods, milk products, spices and condiments. Lantern slides.

Prerequisite: Chemistry 402.

Elective; junior or senior year; second semester; 2 credits; 2 recitations.

Text: Vulte and Vanderbilt: Food Industries.

Fee: \$2.00. Deposit: \$2.00.

417. Methods in Gas Analysis. Required of all Mining students.

Prerequisite: Chem. 401.

Sophomore year; second semester; 1 credit; 1 laboratory period of three hours.

500. Agricultural Chemistry. A general course consisting of lectures, recitations, and laboratory work, dealing with the more important phases of Chemistry in its relation to Agriculture.

Prerequisite: Chemistry 101.

The course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each.

Text: Tartar & Dutcher: Lecture Notes on Chemistry in its Relation to Agriculture; Lincoln & Walton: Quantitative Chemical Analysis.

Fee: \$3.00. Deposit: \$2.00.

501. Agricultural Chemistry. A continuation of course 500.

The course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each.

Fee: \$3.00. Deposit: \$2.00.

502. Dairy Chemistry. A course consisting of lectures, recitations, and laboratory work dealing with the chemistry of milk, milk powders, condensed milk, butter, oleomargarine, cheese and other dairy products.

Prerequisites: Chemistry 500 and 501.

Required of students majoring in Dairy Manufacturing; junior year; second semester; 3 credits; 3 laboratory periods of three hours each.

Text: Bulletin 107, U. S. Bureau of Chemistry; Lincoln & Walton: Quantitative Chemical Analysis; assigned reading.

Fee: \$3.00. Deposit: \$2.00.

503. Soil Chemistry. This is a lecture and laboratory course dealing with the constitution and properties of the chemical constituents of soils; the methods of qualitative and quantitative chemical soil analysis; the chemical changes taking place in soils; the soil solution; and chemical soil deficiencies.

Prerequisite: Chemistry 501.

Junior year; first semester; 2 to 4 credits; 2 to 4 laboratory periods of three hours each.

Fee: \$1.00 per credit. Deposit: \$2.00.

504. Soil Chemistry. A continuation of course 503.

Junior year; second semester; 2 to 4 credits; 2 to 4 laboratory periods of three hours each.

Fee: \$1.00 per credit. Deposit: \$2.00.

505. Agricultural Analysis. A course in analytical methods applied to agricultural materials, including cereals, fertilizers, soil, water, vinegar, insecticides, fruit juices, feeding stuffs, etc.

Prerequisites: Chemistry 500 and 501.

First semester; 2 to 4 credits; 2 to 4 laboratory periods.

Fee: \$1.00 per credit. Deposit: \$2.00.

506. Agricultural Analysis. A continuation of course 505.

Second semester; 2 to 4 credits; 2 to 4 laboratory periods.

Fee: \$1.00 per credit. Deposit: \$2.00.

507. Advanced Agricultural Analysis. This course is especially thesis work in the Experiment Station laboratory, or work of the same general description.

Senior year; first semester; 3 to 4 credits; 3 to 4 laboratory periods.

Fee: \$1.00 per credit. Deposit: \$2.00.

508. Advanced Agricultural Analysis. A continuation of course 507.

Senior year; second semester; 3 to 4 credits; 3 to 4 laboratory periods.

Fee: \$1.00 per credit. Deposit: \$2.00.

509. Animal Chemistry. A study of the composition of the animal body and products of the animal body, such as milk, wool, etc. Special emphasis is placed on the chemistry of the fats, proteins, and carbohydrates. Enzyme action, digestion of foodstuffs, their absorption and distribution, fate of the foodstuffs in metabolism, metabolic products and their excretion, will be considered. Recent publications bearing on animal nutrition will be read and discussed.

Prerequisite: Chem. 501 or its equivalent.

Junior year; first semester; 2 credits; 2 lectures.

Fee: \$2.00. Deposit: \$2.00.

510. Plant Chemistry. Designed for students desiring a full-er consideration of the growth and composition of plants; proper-

ties, nature, and classification of plant constituents; chemical analysis; chemical synthesis; enzymes; chemistry of the manufacture of plant products, etc.

Prerequisite: Chemistry 501 or its equivalent.

Second semester; 2 credits; 2 lectures.

Text: Haas and Hill: Chemistry of Plant and Plant Products; assigned reading.

Fee: \$2.00. Deposit: \$2.00.

511. Seminar. The work will consist of reports and reviews of articles appearing in scientific journals, and experiment station literature. These papers will be prepared under the supervision of the department, although considerable latitude will be allowed in the selection of subjects and manner of presentation. Required of all senior students majoring in Agricultural Chemistry.

Junior or senior year; first semester; 1 credit.

Fee: \$1.00. Deposit: \$2.00.

512. Seminar. A continuation of course 511.

Second semester; 1 credit.

Fee: \$1.00. Deposit: \$2.00.

ENGLISH LANGUAGE AND LITERATURE

FREDERICK BERCHTOLD, Professor.
IDA BURNETT CALLAHAN, Assistant Professor.
SIGURD HARLAN PETERSON, Assistant Professor.
LOREN BURTON BALDWIN, Instructor.
GERTRUDE EWING McELFRESH, Instructor.
GRACE CHRISTINE ROSAAEN, Instructor.

It is the aim of this department to teach the student to express with clearness what he thinks with vigor. He is taught that the essential part of any composition, whether oral or written, is thought, well organized and well expressed; that to comprehend clearly and to feel strongly what he has to say are the indispensable conditions of making others comprehend and feel it.

What his textbook helps him to do consciously, familiarity with superior writers should help him to do unconsciously; for we may get good from a master of English by unconscious absorption, just as we acquire good manners by associating with gentlemen and ladies. No mind can fail to be stimulated by contact with greater minds, whether living or dead. Their pages feed the powers of thought and strengthen the power of expression, thus enabling the student to think, talk, and write to more purpose.

In all the collegiate courses in English the work is correlated with that offered in the other departments, to bring it into harmony with the trend or spirit of the institution, which is distinctly technical and industrial in character. Subjects are assigned for presentation and discussion which bear close relation to the work pursued by the students in the different schools, in anticipation of their probable needs and activities in later life. What is sought and insisted on is, earnest, logical, forceful presentation of facts that will compel attention and carry conviction.

The Oregon Agricultural College participates in a number of intercollegiate oratorical contests and debates; and the department offers elective courses in public speaking, designed to give preparation for these contests.

G. Vocational English. Review of English Grammar. The purpose of the work in English Grammar, as prescribed in Course A and in subsequent Vocational English courses, is such an intensive study of, and persistent drill in, the fundamentals of the subject as shall establish the student in relatively correct usage. The accomplishment of this end is sought by giving the work with such frequency and by such concrete methods as shall tend to create

in the student a liking for the subject of English Grammar. Identification and analysis of sentences. Punctuation. Written and oral exercises in spelling. The specific aim of written composition is the development of the sentence sense, the avoidance of the common grammatical errors in expression, and the production of a legible manuscript. Use is made of the letter as a medium for the solution of simple but actual business problems. Written reproduction of short articles. Short narrative themes. Oral composition comprehending the reproduction of articles, the explanation of processes and mechanisms, and the narration of incidents.

The course in written and oral expression is supplemented by a course of reading designed to enable the student, by helping him to acquire a command of language, the more effectively to discharge the duties of his vocation, to create pleasure for himself in reading good books, and to develop the practice of reading into a habit for life.

The vocational courses; first year; first semester; 3 credits; 3 recitations.

Texts: Boskervill & Sewell: English Grammar.

Books for reading: Fowler: Starting in Life: Choosing a Career; Richardson: The Girl Who Earns Her Own Living.

H. Vocational English. Special attention is given, in the study of Grammar, to the identification of the parts of speech, the classification and uses of clauses, and the conjugation of the verb. Punctuation, with drill primarily on the uses of the comma. The logical arrangement of thoughts as represented in the outline will be discussed and illustrated. In written composition, the content and mechanics of the letter are given particular consideration. Exposition of concrete obj cts. Narrative writing. Oral composition will treat current events and subjects listed for written composition.

Prerequisite: Eng. A.

Vocational courses; first year; second semester; 3 credits; 3 recitations.

Texts: Huntington: Elements of English Composition (Part I.)

Periodical: Current Events.

Books for reading: Hale: What Career? Rollins: What Can a Young Man Do? Alden: Women's Ways of Earning Money.

1. Advanced Vocational English. Study of the structure and functions of phrases; the correction of the common errors in ety-

mology and syntax. Punctuation. Writing reports on newspaper and magazine articles; writing advertisements; drafting simple specifications. Oral composition comprehending current events, sales talks, and informal debates.

Prerequisite: Eng. B.

Periodicals: Youth's Companion, Boy's Magazine, Popular Mechanics, World Magazine. (The student will subscribe for at least one periodical in the foregoing list.)

Books for reading: Shaw: The Outlook for the Average Man; Reid: Careers for the Coming Men; Abbot: Women and Industry.

Vocational courses; second year; first semester; 3 credits; 3 recitations.

Text: Huntington: Elements of English Composition. (Part II.)

J. Advanced Vocational English. Modifications of the verb; drill on the sequence of tenses; practice in the detection and the correction of the more elusive forms of false syntax. Review of Punctuation. The aim of the work in written composition is to improve diction, increase vocabulary, and develop greater variety, force, and directness of expression. Reports on articles in books, magazines, and newspapers. Reports on actual business experiences. Letter writing. Oral composition involving conversations on problems in business and actual life.

Prerequisite: Eng. C.

Books for reading: Kaufman: The Efficient Age; MacLean: Wage Earning Women.

Vocational courses; second year; second semester; 3 credits; 3 recitations.

Text: Gardiner, Kittredge & Arnold: Manual of Composition and Rhetoric.

E. Junior Secondary English. The object of offering this course is to afford students not having completed the English work of the third year of the secondary school an opportunity to take that work.

The course contemplates, in part, a survey of English literature, during the first and second semesters. A study is made of the characteristics of literary epochs, attention being especially directed to the shaping influence of contemporary civil events. Study of a typical masterpiece belonging to each epoch. Assigned readings, followed by oral and written reports.

The work in Rhetoric and Composition involves intensive study and practice in the four forms of discourse already studied in the first two years of the secondary school, the aim of such intensive study and practice being the establishment of the student in good usage.

No textbook is prescribed for Rhetoric and Composition; the principles of Rhetoric will be evolved from the written work prepared and presented by members of the class. The subjects of compositions, whether written or oral, will be chosen, as a rule, from the epochs surveyed, the writers studied, and the books read. Those planning to pursue the course are requested to secure, in order to have at hand a convenient reference, Brooks' two-book course in English Composition, used in the high schools of Oregon.

Prerequisite: Course D or its equivalent.

The vocational course; first semester; 3 credits; 3 recitations.

Textbook: Long: English Literature.

F. Continuation of E. The work in written Composition requires several Expository and several Argumentative themes of such length and of such literary quality as shall thoroughly test the student's ability for sustained, consistent thinking, clear expression, and a just literary appreciation. Oral composition supplementing written, will be a feature of each week's class work. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that he writes in other departments.

The Vocational course; second semester; 3 credits; 3 recitations.

Prerequisite: Eng. E. or its equivalent.

Courses in Home Economics and Industrial Arts; freshman year; first semester; 3 credits; 3 recitations.

Text: Canby et al: Composition in Theory and Practice.

M. Elementary Business English. Besides giving a thorough training in the various forms of commercial correspondence, the course aims to ground the student in the vocabulary, forms, and usages peculiar to business and administrative pursuits. There is constant and persistent practice in spelling and punctuation, in composition and letter writing, with a view to imparting to the student's English strength and virility, and to enable him to achieve results.

Two-years Business course; second year; first semester; 3 credits; 3 recitations.

N. Elementary Business English. A continuation of course M. Advanced composition and letter writing; business forms, incidental writing; summaries; advertising; preparation of copy and proof-reading. Good, clear, effective English is at all times insisted upon.

Prerequisite: Eng. M.

Two-years Business course; second year; second semester; 3 credits; 3 recitations.

Textbook: Lewis: Business English.

31. College Rhetoric. A rapid survey comprehending the work done by the high school in literature, rhetoric, and composition, and involving the preparation of several short essays, with a view to ascertaining the extent of the student's literary appreciation and command of rhetorical principles. Lectures, assignments, and recitations upon the methods of effective discourse. Studies in the expository and argumentative methods of writing, with analysis of specimens. The paragraph considered as a distinct stage in expository composition; practice writing to exemplify the various methods of developing the topic statement. Plotting of simple briefs, and writing of easy forensics. At every stage of study selections from standard and contemporary authors will be read and discussed, in order that the student may acquire ability to master content, differentiate literary types, and appreciate standards of excellence. Subjects of composition will be those suggested by the student's personal, school, literary, community, and vocational interests, oral composition supplementing written.

Compositions required : five expository and three argumentative short themes; one expository long theme requiring research and accompanied by outline and bibliography; one resume and one criticism; one argumentative long theme, accompanied by brief. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that he writes in other departments.

Courses in Home Economics and Industrial Arts; freshman year; first semester; 3 credits; 3 recitations.

32. Advanced College Rhetoric. Study of the elements and principles involved in effective discourse, continued. Lectures on the characteristics of the literature of feeling, with rendering of

selections for illustration. Discussion of the narrative and descriptive methods of writing. Expository and emotional description differentiated. Examination of the narrative principle in epic forms, in ballad literature, in the incidents occurring in the drama, in the news letter, and in anecdote. Studies and practice writing in the narrative paragraph and in dialogue. Analysis of two or three of the briefer and less complex short stories of standard authors, for the purpose of gaining an appreciation of the form and function of the short story type.

Written composition, confined, for the most part, to the descriptive and narrative types of discourse, will be similar in character to that of the first semester. Frequent oral delivery.

Prerequisite: Eng. 31.

Course in Home Economics; freshman year; second semester; 3 credits; 3 recitations.

Text: Moore: English Composition for College Women.

51. The English Essay and Novel. Study of structure of novel and essay. Study of essay and novel as expressions of national life and thought. Emphasizing the growth of the economic, critical, historical, and personal essay, and the larger categories of fiction, the novel of manners, of character, the problem novel, and the romantic novel. Class and individual assignments, lectures, and reports.

Prerequisite: Eng. 32.

Course in Home Economics; sophomore year; first semester; 3 credits; 3 recitations.

Text: Fulton: Essays for Use in College Courses.

52. The English Drama. Study of the Elizabethan and the Stuart drama; the modern drama. A survey of the rise and development of the tragedy, comedy, and historical play. Study of setting, plot, structure, and characters. Reading of plays in class; reports on assigned readings.

Prerequisite: Eng. 51.

Courses in Home Economics; sophomore year; second semester; 3 credits; 3 recitations.

Text: Brooke: The English Drama.

61. The History of English Literature. A general outline course of the history of English literature. This includes a survey of the principal forms of literature as exemplified by the masters

in each field. The aim is to cultivate an appreciation of what is excellent in quality and form. Masterpieces representing the best thought and form are studied in class or assigned to students for careful reading and reports. Chief attention given to Chaucer, Spenser, Shakespeare, Milton, Swift, Pope, Johnson, Burke, Goldsmith, and Burns.

Elective in all courses; first semester; 3 credits; 3 recitations.
Text: Crawshaw: History of English Literature.

62. The History of English Literature. A continuation of course 61. A study of the master minds of the nineteenth century. Wordsworth, Scott, Shelley, Keats, Macaulay, Dickens, Thackeray, George Eliot, Matthew Arnold, Carlyle, Ruskin, Stevenson, Tennyson, and Browning. Lectures, readings, and discussions; critical reports on assigned topics required from all the students.

Elective in all courses; second semester; 3 credits; 3 recitations.

71. American Literature. A study of the growth and development of literature in our country. Particular emphasis is placed on the study of writers of the nineteenth century, including such authors as Irving, Cooper, Bryant, Poe, Hawthorne, Longfellow, Holmes, and Lowell, as well as to prominent writers of the present day.

Lectures; class study; class reading; reports on assigned topics; essays.

Elective in all courses; senior year; first semester; 3 credits; 3 recitations.

72. American Literature. A continuation of course 71. The metropolitan writers; literature in the South; literature in the West; present schools and tendencies; periodical literature. Lectures; class room work; reports; essays.

Elective in all courses; senior year; second semester; 3 credits; 3 recitations.

Text: Wendell & Greenough: Study of Literature in America.

81. Modern English Prose. A study of representative modern prose writers, with special reference to prose as found in such present-day standard periodicals as The Literary Digest, The Independent, and The Outlook. Study of the newspaper paragraph. Practice in reporting lectures. Exercises in the elaboration of field notes. Drills looking to the popularization of technical matters

and the results of experiments. Drafting of resolutions; writing of syllabuses; reduction of the article to a single short paragraph and to a single sentence; analytical outlines of expository articles; finding in a disputation article the proposition upheld and its supporting points; interpretation of advertisements. Writing of papers and reports. Theme writing. Oral composition.

Prerequisite: Completion of a four-years high school course.

The courses in Agriculture, Forestry, Logging Engineering, Mechanical Engineering, Highway and Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy.

Freshman year; first semester; 3 credits; 3 recitations.

Text: The Independent; The Outlook; The Nation; The Literary Digest. Woolley: Handbook of Composition.

82. Modern English Prose. A continuation of course 81.

The courses in Agriculture, Forestry, Logging Engineering, Mechanical Engineering, Highway and Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy.

Freshman year; second semester; 3 credits; 3 recitations.

Prerequisite: Eng. 81.

91. Modern English Prose. A course designed especially for Mining Engineering students.

Freshman year; first semester; 2 credits; 2 recitations.

92. Modern English Prose. Course in Mining Engineering.

Prerequisite: Eng. 91.

Freshman year; second semester; 1 credit; 1 recitation.

101. Special Composition. If a student, in his work in any department, submits papers notably deficient in English, he may be required, at any time, to take course 101. It consists wholly of theme work and consultations, and is continued in each case as long as the needs of the student require.

All courses; first and second semesters; 2 recitations.

103. Composition of Addresses. This course deals with the composition of the most important kinds of addresses, including the argument, the eulogy, the commemorative address, and various forms of non-forensics. The work consists of lectures, a study of textbooks, analysis of masterpieces, practice in the composition of the various forms, and frequent class room exercises.

Elective in all courses; junior year; first semester; 2 credits; 2 recitations.

Text: Baker: Forms of Public Address.

104. Extempore Speaking. Practice in the presentation of the various forms of addresses. Speeches are prepared on topics of special interest to the students and delivered with the view to making them most effective as means in the advancement of a particular cause. Extensive criticism is offered as to methods of selection, organization and presentation.

Elective in all the courses; junior year; second semester; 2 credits; 2 recitations.

Text: Baker: Forms of Public Address.

105. Practical Public Speaking. Practice in the presentation of the various forms of public addresses, voice training, study of gesture, bearing, and the elements of ease, grace, and force in presentation. Practice in the rapid preparation and in the impromptu delivery of speeches on topics of current interest. Designed for those who wish some general training in public speaking. Drill in parliamentary procedure.

Prerequisite: 104.

Elective; first semester; 3 credits; 3 recitations.

Text: Robinson: Effective Public Speaking.

106. Practical Public Speaking. Continuation of course 105.

Prerequisite: Eng. 105.

Elective; second semester; 3 credits; 3 recitations.

Text: Robinson: Effective Public Speaking.

107. Argumentation. Practical work in brief-drawing, the collection and handling of evidence, and debating. Each student will prepare several debates under the direction of the instructor; construct briefs and participate in class room debates. Personal consultation with the instructor on thought, composition, and delivery. This course is a critical and practical study of argumentation. The class is limited in number, and the course can be taken only with the consent of the instructor.

Elective; second semester; 2 credits; 2 recitations.

Text: Foster: Argumentation and Debate.

108. Oratory. This course is intended as special preparation for those who wish to enter oratorical work. The work consists of lectures on the theory of oratory, the preparation of original orations, class room exercises, and personal conferences and criticism. The course can be taken only with the consent of the instructor.

Elective; first semester; 1 credit; 1 recitation.

Text: Shurter: The Rhetoric of Oratory.

141. Technical English. The writing which the engineer has to do is almost wholly of the nature of exposition. Indeed, it is only in so far as it is expository that it offers any problems different from those which arise in general composition. In technical English, then, in the engineering courses, attention is centered on exposition of the various types which the engineer has to use, in description, in narration, in directions, in criticism, and in argumentation.

At all times it will be insisted on that whatever facts the student expresses, shall be expressed accurately; that the treatment of the subject shall be complete for the purpose in hand; that the form of presentation shall be logical; and that the expression shall be economical for the reader.

Required in the course in Mining; elective in all other courses; senior year; first semester; 3 credits; 3 recitations.

Text: Earle's Theory and Practice of Technical English for Engineers.

142. Technical Business English. Study of advanced technical composition. Special attention is given to letters of application, letters of inquiry and information, circular letters, letters of complaint, sales letters, follow-up letters, and collection letters. The ability to write a clear, forceful, effective letter has become a first requisite, not only for business success, but for intellectual and social recognition.

Prerequisites: Eng. M, N.

The course in Commerce; freshman year; first semester; 3 credits; 3 recitations.

Text: Lewis: Business English.

191. Story-Telling. The study of children's literature, and the analysis and reproduction of short stories suitable for the primary grades, the kindergarten, and the nursery.

Elective in the course in Home Economics; senior year; first semester; 1 credit; 1 recitation.

192. Story-Telling. A continuation of course 191.

Elective in the course in Home Economics; senior year; second semester; 1 credit; 1 recitation.

206. Expression. Literary interpretation, including analysis, memorizing, and rendering of selected masterpieces of prose and poetry. The aim of this course is to enable the student not only to understand and appreciate the thought and spirit of literature, but to render it naturally and effectively; to correct erroneous habits of speech, and to give freedom, purity, and strength of tone to cultivate the power of expression through imagination; to eliminate artificiality, affection, and self-consciousness.

Elective; first semester; 2 credits; 2 recitations.

207. Expression. Continuation of course 206.

Elective; second semester; 2 credits; 2 recitations.

208. Dramatic Interpretation. Advanced literary interpretation. Training in delivery of masterpieces of prose and poetry. Interpretative study of Shakespeare and the modern drama; presentation of scenes from plays; bodily expression; impersonation.

Prerequisites: Course 206 and 207.

Elective; first semester; 2 credits; 2 recitations.

209. Dramatic Interpretation. Continuation of course 208.

Elective; second semester; 2 credits; 2 recitations.

301. Elementary News-Writing. Instruction and training in judging news values, gathering and writing news, and in newspaper correspondence. Writing news technical to Agriculture, Home Economics, Engineering, Commerce, Forestry, etc. Open to students of junior rank and others especially recommended by the Professor of English. Recommended to all students majoring in Home Economics or in Education. Required as a condition of eligibility for leading positions on student publication staffs.

Elective in all courses; junior year; first and second semester; 2 credits; lecture and laboratory period.

302. Advanced News-Writing. A continuation of course 301, dealing with special technical and feature writing, reporting, copy reading, editorial writing, proof-reading, make-up, and head-writing, with field work in writing specials to various publications.

Prerequisite: English 301 or its equivalent.

Elective in all courses; junior or senior year; first and second semester; one credit; one lecture.

315. Seminar. Study and review of the recognized masterpieces of European Continental literature in approved translations.

Elective in all courses; first semester; 2 credits; 2 recitations.

316. Seminar. A continuation of course 315.

Elective all courses; second semester; 2 credits; 2 recitations.

HISTORY

JOHN B. HORNER, Professor.

The study of history is fundamental to leadership, there being no line of human investigation that does not depend upon historic knowledge. History is required in Commerce and is offered as an elective in all other schools of the Oregon Agricultural College.

The instruction is largely given by lectures illustrated with lantern views. In the more advanced classes, each student is required to prepare at least one lecture. Although text-books are required, the work in the various courses in history is done in connection with the college library, which is accessible to students on all week days. The courses given at present are as follows:

D. United States History. With special attention to the colonial, political, and industrial aspects. A brief course that covers the leading events of our history. Particularly important in Oregon since the introduction of direct legislation and equal suffrage.

Two-years Business course; first year; second semester; 3 credits; 3 recitations.

Text: Muzzey: American History.

30. European History. Course 30 includes the study of Europe at the time of Louis XIV; reconstruction of Europe at Utrecht; Russia and Prussia become European powers; Wars of Frederick the Great; Struggle between France and England for India; Rivalry of France and England in North America; The Old Regime in Europe; The Spirit of Reform; Enlightened Despots of the Eighteenth Century; The French Revolution; The First French Republic; Europe and Napoleon; The Reconstruction of Europe at the Congress of Vienna.

Elective; first semester; 3 credits; 3 recitations.

Text: Robinson & Beard: The Development of Modern Europe, Vol. I.

40. Modern Europe. This course comprises a study of the following subjects: Europe after the Congress of Vienna; The Industrial Revolution; Revolution of 1848; Unification of Italy; Formation of the German Empire and the Austro-Hungarian Union; The German Empire; France under the Third Republic;

Social and Political Reforms in England; British Empire in the Nineteenth Century; Russian Empire in the Nineteenth Century; Turkey and the Eastern Question; The Expansion of Europe in the Nineteenth Century; Some of the great problems of today.

The course in Commerce; sophomore year; second semester; 3 credits; 3 recitations.

Text: Robinson & Beard: The Development of Modern Europe, Vol. II.

52. History of the British Empire. A coherent view of the larger factors influencing national development from the earliest times to the British Empire of today. Social, economic, artistic, and intellectual growth is broadly surveyed, and is made to reveal a picture of the changing conditions of the people rather than that of the king and nobility. Legal and constitutional development is also emphasized by tracing the origin and development of English common law and by discussing the nature and importance of the great statutes. Particular attention is given to such subjects as the Industrial Revolution, Growth of the Power of the House of Commons, the Extension of the Franchise, Remedial Legislation, and Colonial and Imperial Development.

Elective; senior year; first semester; 3 credits; 3 recitations.

Text: Cross: History of England and Greater Britain.

62. Contemporary American History. The history of the United States from the Discovery of America to the present time. Collateral with the text-books such matters as the negro question, the industrial revolution, capitalism and socialism, free silver, direct government, woman suffrage, the growth of judicial review, the new nationalism, imperialism, the labor movement, the progressive movement, the Panama-Colombia question, present status of the Monroe Doctrine, and our relation with the Latin-American republics, are discussed from the standpoint of history.

Prerequisite: History D or its equivalent.

The course in Commerce; freshman year; second semester; 3 credits; 3 recitations.

Text: Elson: History of the United States.

70. History of Oregon. Early explorations. Lewis and Clark expedition. Minor expeditions. Fur trade. Rivalry between companies. Era of immigration. Oregon organized under Hudson Bay Company. Agitation in Congress for military occupation of the Columbia. The Nez Perce Indians ask for the Bible. Response by

Methodists and Congregationalists. Doctor Whitman and the Oregon movement. Struggle for the Willamette. Struggle for the Columbia. First transcontinental wagon road. Provisional government. Progress of immigration and missions. Gold excitement. Subdivision of Oregon into territories. Indian wars. Home building. Disposition made of the Indians. Oregon becomes a state. Introduction of improved fruit, grains, and stock. Ships and railways. Select schools, public schools, and higher education. Oregon literature. Industrial training, and introduction of scientific methods. Irrigation; conservation of forests. "The Oregon System" of direct legislation.

The course in Commerce; sophomore year; first semester; elective second semester; 3 credits; 3 recitations.

Text: Clarke: Pioneer Days of Oregon History.

80. American Diplomatic History. This course deals with the history of the chief events in American foreign affairs from the beginning of the government to the present time. Its purpose is to show the policies of our government on the same subject at different times, the causes for the changed policies, and the methods employed to work out the policies. An attempt is made to show the changed attitude of governments in their dealings with each other in the course of our national history. Throughout the course considerable attention will be given to character studies of the men leading in our diplomatic work. The ultimate aim is the application of our experience to present problems.

Elective; senior year; second semester; 3 credits; 3 recitations.

100. American Biography. A study in the public careers of typical American statesmen and other men of affairs. It is intended to cover the entire field of American history. The object is to emphasize the personal element in our national development and to become more familiar with the leaders of our economic progress. Students desiring to place especial stress upon any feature of the study may elect not to exceed 20 per cent of their allotment of biographical research. (Lectures, assigned reading, and discussion.)

Elective; junior or senior year; first semester; 3 credits; 3 recitations.

110. History of South America. This course includes the history of South America, Central America, and Mexico; hence com-

prises the discovery, colonization and growth of Latin America. Although the dramatic story of our southern neighbors reads like a romance, the course is designed primarily to meet the requirements of Americans who desire to cultivate deeper interest in our sister republics through a broader knowledge of their political and economic development.

Elective; 3 credits; 3 recitations.

INDUSTRIAL EDUCATION

EDWIN DEVORE RESSLER, Professor
HELEN BRYCE BROOKS, Professor of Domestic Art
AVA BERTHA MILAM, Professor of Domestic Science
_____, Professor of Agricultural Education
FRANK HENRY SHEPHERD, Assistant Professor
BERT WALTER HARRIS, Assistant Professor of Stenography*
_____, Assistant Professor

The department of Industrial Education offers courses for the preparation of teachers in the subjects of Agriculture, Home Economics, Commerce, and Manual Training. The importance of providing special instruction in the industries for the pupils of the public schools is fully recognized in this country. The material equipment in the way of laboratories, workshops, experimental fields, etc., is easily secured. Specially trained teachers cannot be prepared overnight. There is a real danger that the public will underestimate the scientific and educational significance of the new education. The industrial branches cannot be taught from textbooks nor by teachers without technical training.

There must also be special supervisors in each of the industrial branches for the larger schools, where instruction is given to a large number of pupils under both trained and untrained teachers. Supervisors, who will do some regular teaching, are also required where a number of small town and country districts are grouped for industrial instruction. In time, we may expect the grade teachers to have secured through the high and normal schools the technical training that will enable them to teach the industrial branches under direction. Until that time, most of the teaching must be done by the special instructor.

The department of Industrial Education gives the professional training and advises with the students and deans of the various schools in the selection of the technical courses. In conjunction with the other departments concerned, tentative courses of study are prepared in each of the industrial branches, adapted to the age of the pupils and the social demands on the school. This department undertakes to assist teachers in the work of instruction, by general and special suggestions through college and other publications, and by correspondence and visitation. Detailed lists of

* On leave of absence.

equipment and apparatus, with cost, suitable for small and large schools, will be furnished on request.

Students electing this course will be registered in the school in which their distinctive subject is given. Thus those who desire to prepare to teach and supervise Agriculture in the high school and grammar grades will be registered in the School of Agriculture and will receive their degrees in Agriculture on completion of the requirements.

In the same way students desiring to prepare to teach Home Economics and Commerce will be registered in the schools of Home Economics and Commerce. A special degree course in Industrial Arts, described under that heading, has been organized for the preparation of teachers of Manual Training.

Students are advised to consider carefully the selection of teaching as a vocation. Good scholarship, and the ability to speak, spell and write the mother tongue correctly are fundamental essentials. Personality, altruism, enthusiasm, professional aptitude, and, above all, moral character, are demanded of the teacher. Positions cannot be guaranteed and none but capable candidates will be recommended.

The Oregon School Law grants a high school teaching certificate to graduates who have taken 15 credits in education. These courses should be taken during the junior and senior years. Students should note the prerequisites as shown below.

The following courses will be offered during 1916-17:

101. General Psychology. A study of general psychology by lectures, recitations, and reports; a description of the facts and laws of mental activities with applications to the ordinary affairs of life; demonstrations and experiments showing the relation of mental life to the nervous system; the significance of habit in conduct and character.

Required of all students preparing to teach.

Junior year; first or second semester; 3 credits; 2 recitations; 1 laboratory period.

102. Educational Psychology. The application of the facts and principles of psychology to teaching; a study of the growth of the child mind and the relations of the various periods of educational organization; adaptation of courses of instruction, methods of teaching, discipline, and general school activities to the stages

of the pupil's development; lectures, recitations, reports, and simple investigations.

Prerequisite: Ind. Ed. 101. Required of all students preparing to teach.

Junior year, second semester; or senior year, first semester; 2 credits; 1 recitation; 1 laboratory period.

120. History of Education. A general review of the growth and development of education and its relation to the civilization of the times; particular attention given to the rise of industrial education in Europe and America, and its place in the social and political life of the country.

Sophomore or junior year; first or second semester; 3 credits; 3 recitations.

125. History and Theory of Vocational Education. Arranged to meet the needs of those preparing to teach any phase of vocational education. Emphasis placed on the present day literature of the subject. History of vocational education; its function in a system of education; development in the United States; present status; attitude of organized labor; demands of manufacturers; rights of society; legislation in different states. Lectures, assigned readings, oral and written reports.

Election in junior or senior year; first semester; 2 credits; 2 recitations.

132. Principles of Education. An introduction to the study of education, including a discussion of the meaning of education, its significance in the development of the race, its aims, its method, its functions; brief description of present foreign systems and a fuller account of our own; organization of the school, relations and duties of pupils, teachers, supervisors and school boards; problems of school management; conduct of classes and general method; all with particular reference to the special, industrial teacher.

Required of all students preparing to teach; junior year; first semester; also given second semester; 3 credits; 3 recitations.

135. Vocational Guidance. An investigation of the means and methods of assisting the pupils of the upper grammar grades and high school in studying the problem of their future vocations. Factors of individual aptitude, heredity and other personal characteristics; means of discovering these factors through school and other agencies; studies of occupations with essential qualifications for success in leading types; value of "life career" motive in education; survey of state and local resources as guides to choice, etc.

Lectures, reports on the extensive literature of vocational guidance and some practical experience with pupils, under the careful supervision of the instructor.

Elective for juniors and seniors; second semester; 2 credits; 2 recitations.

Junior or senior year; first or second semester; 3 credits; 3 recitations; 1 laboratory period (2 in H. E. section.)

152. Special Method in Agriculture. A careful, detailed study of the public school course in Agriculture, in its various relations, including the other subjects in the curriculum, preparation for college, farming, community life, etc. Model courses for both elementary and secondary grades are constructed with plans for all desired equipment for laboratory, library, field work, including cost. Lesson plans on typical subjects, observation and model lessons, practice teaching, and extension work with school children and adults, provide additional opportunities to enable the students to reduce theory to practice.

Prerequisites: Ind. Ed. 101, 132.

Required of seniors majoring in Agriculture for teachers.

Junior year, second semester; or senior year, first semester; 2 credits; 2 recitations.

153. Special Method in Agriculture. Continuation of course 152.

Prerequisites: Ind. Ed. 101, 132, 152.

Required of seniors majoring in Agriculture for Teachers; senior year; first or second semester; 2 credits; 1 recitation; 1 laboratory period.

160. Special Method in Home Economics. Same as course 152 applied to the public school course in Home Economics.

Prerequisites: Ind. Ed. 101, 132.

Required of Home Economics students preparing to teach.

Junior year, second semester; or senior year, first semester; 3 credits; 2 recitations; 2 laboratory periods.

164. Special Method in Domestic Art. Continuation of 160, applied to the public school course in Domestic Art.

Prerequisites: Ind. Ed. 101, 132, 160.

Required of students preparing to teach Domestic Art.

Senior year; first or second semester; 2 credits; 2 recitations; 1 laboratory period.

Fee: \$0.50.

165. Special Method in Domestic Science. Continuation of course 160, applied to public school course in Domestic Science.

Prerequisites: Ind. Ed. 101, 132, 160.

Required of students preparing to teach Domestic Science; senior year; first or second semester; 2 credits; 2 recitations; 1 laboratory period.

Fee: \$1.50.

172. Special Method in Manual Training. Same as course 152, applied to the public school course in Manual Training.

Prerequisites: Ind. Ed. 101, 132.

Industrial Arts; junior year, second semester; or senior year, first semester; 2 credits; 2 recitations.

173. Special Method in Manual Training. Continuation of course 172.

Prerequisites: Ind. Ed. 101, 132, 172.

Industrial Arts; senior year; first or second semester; 2 credits; 1 recitation; 1 laboratory period.

174. Theory and Practice of Elementary Manual Arts. A course for supervisors who must arrange courses and supervise Industrial Arts in the lower grades. Investigation of the present trend of the manual arts movement; arrangement of a suggestive course of study; plan of equipment; ordering of supplies; etc; sand table projects, rug weaving, paper folding, thin wood work, and other forms of construction work for the first six grades of the elementary school. Lectures, assigned reading, reports and practical shop work.

Required in Industrial Arts; elective in other courses; junior or senior year; first or second semester; 2 credits; 1 recitation; 1 laboratory period.

180. Special Method in Commerce. Same as course 152, applied to the public school course in Commerce.

Prerequisites: Commerce 102, 402, 412; Ind. Ed. 101, 132.

Senior year; first semester; 2 credits; 2 recitations.

Required of students preparing to teach Commercial branches.

181. Special Method in Commerce. Continuation of course 180.

Prerequisites: Commerce 102, 402, 412; Ind. Ed. 101, 132, 180.

Senior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

190. School Administration. A discussion and analysis of the American system of education, with an interpretation of the purpose and spirit of each division; problems of administration and teaching in the public schools; the correlation of the industrial branches with the other subjects in the curriculum. Lectures, reading, reports, and studies on the Oregon schools.

Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

191. School Hygiene. A course in the health provisions requisite for the hygienic conduct of education. This includes a discussion of ventilation, heating, light, seating, physical exercise in the school room and on the playground, games, medical inspection, tests for physical defects, disinfection, quarantine, and other similar topics. Oregon laws relating to these matters will be studied, and the regulations of the State Board of Health and other State and local health authorities will be explained in detail. Advanced investigations in other states will also be presented and comparative studies made. Lectures, reports, and first-hand investigations on town and country school conditions, so far as practicable.

Elective for advanced or graduate students; first semester; 2 credits; 2 recitations.

192. Child Study. This includes the physical and mental characteristics of children and youth as contrasted with those of mature men and women. The relation of physical growth and development to the unfolding of mental powers; the instincts and their relation to the development, of individuality, sense of responsibility to others, moral development, etc.; abnormalities; study and treatment of children as individuals and in class groups; and discussion of the social and economic implications as well as the psychological. (Lectures, reports, and simple tests and records made by visitation of schools.)

Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

Prerequisites: Ind. Ed. 101, 102, 132.

200. Research. Advanced or graduate students who are qualified by previous training or experience, may register for extended investigation of some specific problem in industrial education. The studies may be historical, either European or American; administrative; or in the field of method. General government and state reports; publications by special commissions; reports of committees of educational organizations; contributions by departments

of colleges and universities; educational and other periodicals; and original investigations into Oregon conditions, compose the material to be used. These studies will be assigned and outlined by the instructor and stated reports made from time to time by the student. Regular hours will be assigned the individual students and credit given according to the amount of work done.

Elective for advanced or graduate students; first semester; 2 credits.

201. Research. Continuation of course 200.

Prerequisites: Ind. Ed. 101, 132, 200.

Elective for advanced or graduate students; second semester; 2 credits.

202. Research. As outlined in course 200.

Prerequisites: Ind. Ed. 101, 132.

Elective for advanced or graduate students; first semester; 4 credits.

203. Research. Continuation of course 202.

Prerequisites: Ind. Ed. 101, 132, 202.

Elective for advanced or graduate students; second semester; 4 credits.

LIBRARY

IDA ANGELINE KIDDER, Librarian
LUCY MAY LEWIS, Library Cataloguer
LILLIAN MABEL GEORGE, Library Cataloguer
RACHEL WEBB HAIGHT, Assistant
LILA GRACE DOBELL, Assistant
BLANCHE MARIE CLAUSMEYER, Assistant

Equipment. The Library occupies the second floor of the Administration building and one room on the first floor. The reading and general reference room is large, well lighted, and extends entirely across the building. It is supplied with about five hundred leading magazines and newspapers. Through the courtesy of the editors, a large number of farm, orchard, stock, and home journals, and country newspapers of Oregon are received regularly at the reading room. The book stacks, occupying adjacent rooms, contain 27,000 volumes of standard works of history, biography, engineering, agriculture, natural science, general literature and reference, and about 3000 reports and other publications from the Agricultural Colleges and Experiment Stations of all the states, with 30,000 bulletins and pamphlets. The library is a designated depository of United States Government publications, of which it has about 7,000 volumes. Over 2,000 of these were received as a gift from the library of the late United States Senator Dolph.

Practical use of the books has led to the establishment of small laboratory collections kept in the rooms of the following departments: General Chemistry, Agricultural Chemistry, Animal Husbandry, Agronomy, Horticulture, Botany, Forestry, Bacteriology, Zoology, Pharmacy, Commerce, and Civil, Mechanical, Electrical, and Mining Engineering. Each department library is in charge of the head of that department, to whom application must be made for the use of the books.

All books are classified and catalogued according to the Dewey decimal system. Books may be drawn for home use by all officers and students of the College. Books may be kept by the students for two weeks with the privilege of a renewal, and by officers for any reasonable time. All students have free access to the shelves of the library.

The reference library in the reading room consists of encyclopedias, dictionaries, standard reference books in the different de-

partments of study together with books designated by professors for collateral reading in the various courses of instruction. A small collection of books for cultural reading is also kept in the reading room. In the same room, and accessible to all readers, is the card catalogue of the general library, including the books of the department libraries. The catalogue includes both authors and subjects under one alphabet on the dictionary plan; there is also a card catalogue of the publications of the U. S. Department of Agriculture, and a card index to the publications of the State Experiment Stations.

1. Library Practice. This course teaches, by means of lectures and practical problems, the use of catalogues, indexes, and reference books, such as dictionaries, encyclopedias, atlases, handbooks of general information, handbooks of history, statistics, quotations, etc.

All degree courses; freshman year; one semester; $\frac{1}{2}$ credit; 1 lecture; 1 recitation; 1 laboratory period each alternate week.

MATHEMATICS

CHARLES LESLIE JOHNSON, Professor
EDWARD BENJAMIN BEATY, Associate Professor
NICHOLAS TARTAR, Assistant Professor
HARRY LYNDEN BEARD, Instructor

A. Algebra. The work of the course includes a drill in the fundamental operations, use of parentheses, special rules of multiplication and division, factoring, highest common factor, lowest common multiple, and fractions.

The Mechanic Arts course; first year; first semester; 5 credits; 5 recitations.

Text: Hawkes-Luby-Touton: First course in Algebra.

B. Algebra. The topics studied are solution of fractional and literal equations, problems involving linear equations, simultaneous linear equations, involving two or more unknown numbers, problems involving simultaneous linear equations, graphical representation, inequalities, involution, evolution, theory of exponents, radical expression, and imaginary numbers.

The Mechanic Arts course; first year; second semester; 5 credits; 5 recitations.

Text: Hawkes-Luby-Touton: First course in Algebra.

C. Algebra. Required of freshmen who enter with but one year of Algebra.

Either semester; 3 credits; 3 recitations.

Text: Hawkes-Luby-Touton: First course in Algebra.

D. Plane Geometry. Course D includes the first two books of Plane Geometry. The constant aim is to develop in the student the power of logical reasoning, and of clearness and accuracy of expression. To this end, many original exercises are studied, and at all times demonstrations and proofs are freely discussed in the class room. Required of freshmen entering deficient in first semester of Plane Geometry.

First semester; 3 credits; 4 recitations.

Text: Wentworth & Smith: Plane Geometry.

E. Plane and Solid Geometry. A continuation of Course D, arranged for freshmen in Engineering who enter deficient in the second semester of Plane Geometry.

Second semester; 5 credits; 5 recitations.

Text: Wentworth & Smith: Plane and Solid Geometry.

F. Solid Geometry. Required of all Engineering freshmen who are deficient in Solid Geometry.

Freshman year; first semester; 2 credits; 3 recitations.

Text: Wentworth & Smith: Solid Geometry.

G. Plane Geometry. Courses G and H are arranged for freshmen who enter deficient in the second semester of Plane Geometry, and who desire to use both semesters to make up the condition. The two courses are equivalent to course K.

Freshman year; first semester; $1\frac{1}{2}$ credits; 2 recitations.

Text: Wentworth & Smith: Plane Geometry.

H. Plane Geometry. A continuation of course G.

Freshman year; second semester; $1\frac{1}{2}$ credits; 2 recitations.

Text: Wentworth & Smith: Plane Geometry.

K. Plane Geometry. A continuation of course D, covering the last three books of Plane Geometry. Many original exercises are studied. Required of freshmen, except those in Engineering, who enter deficient in second semester of Plane Geometry.

Second semester; 3 credits; 4 recitations.

Text: Wentworth & Smith: Plane Geometry.

L. Plane Geometry. A course arranged to meet the needs of students in Mechanic Arts.

The course in Mechanic Arts; second year; second semester; 4 credits; 5 recitations.

Text: Wentworth & Smith: Plane Geometry.

M. Commercial Arithmetic. A review of all the essential operations. Special stress is laid on short methods; daily drills in rapid calculation; computation of estimates; partnership settlements, etc.

The two-years Business course; first year; first semester; 3 credits; 5 recitations.

Text: Van Tuyl: Essentials of Business Arithmetic.

N. Commercial Arithmetic. A continuation of course M.

The two-years Business course; first year; second semester; 3 credits; 5 recitations.

Text: Van Tuyl: Essentials of Business Arithmetic.

O. Shop Arithmetic. A thorough drill in the principles of arithmetic, with special application to shop problems of all sorts.

The course in Mechanic Arts; second year; first semester; 4 credits; 5 recitations.

Text: Bolton: Shop Mathematics.

R. Farm Arithmetic. An elective course for students in the vocational course in Agriculture who feel the need of a review of arithmetic. A practical text dealing with problems of the farm will be used.

The vocational course in Agriculture; second semester; 3 credits; 3 recitations.

Text: Burkett & Swartzel: Farm Arithmetic.

T. Geometry and Trigonometry.

The course in Mechanic Arts; third year; first semester; 4 credits; 5 recitations.

10. Advanced Arithmetic. An advanced course in commercial arithmetic, especially for students in the School of Commerce. To do successful work in this course, the student should have a thorough knowledge of all the fundamental operations of arithmetic, including the various phases of percentage and interest. Emphasis is laid on computations of the more difficult problems connected with partnership and corporation settlements, balance sheets and statements, equation of accounts, partial payments, savings bank accounts, compound interest, stocks and bonds, life insurance, and annuities, partly for the information obtained in the various subjects and partly for the drill afforded in the use of figures. Daily drills are given in short methods and rapid calculation.

The course in Commerce; freshman year; first semester; 3 credits; 3 recitations.

Text: Van Tuyl: Complete Business Arithmetic.

11. Plane Trigonometry. This course includes functions of acute angles, right angles, functions of any angle, relations between functions, inverse functions, trigonometric equations, and oblique triangles. Considerable time is devoted to the deduction of trigonometric formulae, study of trigonometric identities, and the solution of practical problems.

All Engineering courses; freshman year; last three-fifths first semester; 3 credits; 5 recitations.

12. Plane Trigonometry. The course in Industrial Arts, second semester; 3 credits; 4 recitations.

14. Trigonometry. A review of algebra, including logarithms, is followed by a course similar in character to 11, except that more time is given to the solution of practical problems.

The course in Forestry; freshman year; first semester; 3 credits; 4 recitations.

15. Spherical Trigonometry. The courses in Highway and Irrigation Engineering; freshman year; first semester; one credit; one recitation.

21. College Algebra. After a brief review of radical expressions, theory of indices, and quadratic equations, graphical representation and mathematical induction are studied.

All Engineering courses; freshman year; first two-fifths of first semester; 2 credits; 5 recitations.

Text: Hawke: Advanced Algebra.

22. Algebra. A course for freshmen in Engineering who show by poor work in courses 11 or 21 that they need further preparation in algebra before continuing their mathematics.

All Engineering courses; freshman year; second semester; 5 credits; 5 recitations.

Text: Hawkes-Luby-Touton: Second Course in Algebra.

31. Elementary Analysis. Under College Algebra are treated the binominal theorem, progressions, complex numbers, and the theory of equations. In analytical geometry the point, straight line, circle, conic sections, and some of the higher plane curves are studied. Considerable time is given to the plotting of curves in both rectangular and polar coordinates.

All Engineering courses; freshman year; second semester; 5 credits; 5 recitations.

34. Elementary Analysis. This course is similar to 31, but shorter. Particular emphasis is given to curve plotting in both rectangular and polar coordinates.

The course in Forestry; freshman year; second semester; 3 credits; 4 recitations.

Text: Granville & Smith: Elementary Analysis.

41. Plane Analytic Geometry. Course 41 is offered to students who enter the sophomore year deficient in Analytic Geometry. The topics studied are the point, the straight line, polar coordinates, transformation of coordinates, the circle, conic sections, tangents, diameter, poles and polars, discussions of general equations of the second degree, problems in loci, and higher plane curves.

All Engineering courses; sophomore year; first semester; 3 credits; 3 recitations.

51. Differential Calculus. Among the subjects presented are: differentiation and applications, evaluation of indeterminate forms, expansion of functions, Taylor's and Maclaurin's theorems, maxima

and minima, points of inflection, curvature, change of independent variable, functions of two or more variables, asymptotes, curve tracing, etc.

All Engineering courses; sophomore year; first semester; 4 credits; 5 recitations.

Text: Granville: Differential and Integral Calculus.

52. Integral Calculus. Among the topics considered are: direct integration, definite integrals and applications; integration by parts, integration of trigonometric forms, etc.; applications to finding of lengths and areas of curves, surfaces, and volumes of solids of revolution, etc.; double and triple integration and applications. In this course, as in Course 51, great stress is laid upon practical applications, and a large number of practical problems are solved.

All Engineering courses; sophomore year; second semester; 4 credits; 5 recitations.

Text: Granville: Differential and Integral Calculus.

61. Differential Equations. A study of the solution of ordinary and partial differential equations which the Engineering student is likely to encounter.

Prerequisites: Courses 51, 52.

Elective; junior year; first semester; 3 credits; 3 recitations.

Text: Campbell: Differential Equations.

71. Method of Least Squares. Prerequisites: Courses 51, 52.

Elective; junior year; second semester; 2 credits; 2 recitations.

Text: Merriman: Method of Least Squares.

81. Hyperbolic Functions.

Prerequisites: Courses 51, 52, 61.

Elective; junior or senior years; second semester; 2 credits; 2 recitations.

Text: McMahon: Hyperbolic Functions.

MILITARY SCIENCE AND TACTICS

ULYSSES GRANT McALEXANDER, Major, Infantry, U. S. A., Commandant, Professor of Military Science and Tactics
CYRUS FRANKLIN DUGGER, Post Commissary Sergeant, U. S. A., Retired, Assistant
DENIS HAYES, Sergeant Major, U. S. A., Retired, Assistant

The Oregon Agricultural College was founded in pursuance of three lines of national legislation. The first of these was the Act of Congress known as the Congressional Land Grant Act, of July 2, 1862, and the Acts supplemental thereto, for the establishment of colleges "where the leading object shall be, without excluding other classical and scientific studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts."

The absolute dependence of the College upon the benefactions of the Nation and the State imposes a particular obligation on all who enjoy its privileges. The College, on its part, conforming to the spirit of law, has provided for an efficient system of military instruction, and the Corps of Cadets is entitled to the loyal, zealous, and true support of each and every student in the College. That it receives that support each year will be best evidenced by the standing which the corps attains among the military organizations of the higher universities and colleges.

The Congressional Land Grant Act of 1862 requiring military instruction, was passed during a critical period in the life of the Nation while it was engaged in a civil war. The best of evidence was then at hand showing the need of trained citizen soldiers prepared at all times for service in the cause of the Nation. The object of the law, therefore, was to provide well-trained citizen soldiers. This object has been successfully met. Students enrolled in the Military department may attain a high state of military proficiency, if the spirit, as well as the letter of the law, is followed out during the prescribed course, thereby fulfilling a duty to the Nation, the State, and the College.

The military body of this College consists of one regiment of infantry having three battalions of four companies each, a hospital corps and signal corps detachment, and a band of fifty instruments. The drill and administration are the same as in the Regular Army.

One of the objects of this instruction is to prepare the cadet so that upon graduation he will be thoroughly competent to hold a commission in the National Guard or volunteer army.

The greater part of the instruction is directed toward having cadets adopt a systematic rule of conduct inculcating accurate methods in everything they undertake. This not only places cadets in the condition to receive favorably all instruction in the military department, but facilitates study in the other departments, and becomes a valuable asset to a young man going out into the world in any profession.

Military drill improves the habits and manners of the student, develops him physically, and gives him that military knowledge which it is desirable every citizen should possess in order that he may render intelligent aid to his country or state in time of need. It cultivates a manly spirit, ready and implicit obedience, respect for authority, and self-restraint—all qualities of inestimable value to a young man in whatever calling he may select.

Instruction in the course is prescribed for all undergraduate male students. The instruction is both practical and theoretical.

The new armory contains a drill room 120x300 feet in extent, ample office room, and suitable rooms for storage of guns and other ordnance.

Eight hundred and forty U. S. magazine rifles (Krag-Jorgensen), with equipment and ammunition, are furnished by the U. S. government. Other necessary accoutrements and apparatus for the thorough equipment of the military department are furnished by the College.

Appointment and promotion of officers and non-commissioned officers, and their relative rank in each grade, are determined according to the military standing of the cadets, based upon a careful consideration of the following points: knowledge of drill and other duties, as determined by examination, practical application of this knowledge on the drill field, and recommendations of superior officers; zeal, soldierly bearing, and aptitude for command; character; military record; general standing in College.

Commissioned officers are selected from the senior class or from such students as have had three or more years of drill; non-commissioned officers, from the junior and sophomore classes; all reductions are to the grade of private. All appointments and pro-

motions are made by the Commandant, with the approval of the President of the College.

Work in military drill is required of all male students of the institution, including all regular degree students, and all vocational, special, and optional students, except short course Forestry students, four periods a week throughout their undergraduate course. Senior privates may, however, upon petition approved by the President of the College, be excused.

One credit a semester is allowed for military drill, and grades are reported at the end of each semester the same as in any other subject.

Students physically unable to participate in the regular military drill may be assigned by the Commandant to light duty in the department.

Persons transferring to the Oregon Agricultural College with advanced credits from other educational institutions of equal rank will not be exempt from the military requirements, but will be required to offer an equivalent of credits for the back military credits represented or accumulated.

Persons presenting credentials for military work taken at other educational institutions, or for service in the U. S. Army, may be given credit for such work in so far as it is deemed equivalent to the requirements of this institution.

If for any reason a student is relieved from the military requirements, except as specified above, other credits must be substituted therefor.

The practical course in infantry includes the School of the Soldier; School of the Squad; School of the Company; School of the Battalion; School of the Regiment; Ceremonies; Intrenchments; Guard Duty; and Combat. The practical course in the Field Service Regulations will include the Service of Information and the Service of Security. The practical work in Small-arms Firing will include instruction preliminary to gallery and range practice; gallery practice; and range practice. A gallery range with four targets has been built and an outdoor range with four targets can be used. The instruction also includes company administration, camp sanitation, and map reading.

Paragraph 24, General Orders No. 70, War Department, November 18, 1913, directs that, "Upon occasions of Military Cere-

mony, in the execution of drills, guard duty, and when students are receiving any other practical military instruction, they shall appear in the uniform prescribed by the institution. They shall be held strictly accountable for the arms and accoutrements issued to them."

The wearing of mixed civilian and uniform clothing is prohibited. The commandant has general charge of all matters pertaining to the uniform at all times. The uniform complete, including the regulation tan shoes, costs about \$14.50, it is of the regulation olive-drab color adopted by the United States Army, and makes a very neat and serviceable suit. It consists of an olive-drab cap with ornament, an olive-drab blouse with collar ornaments, a pair of olive-drab breeches, an orange colored hat band, an orange colored breast cord, a pair of canvas puttee leggings of the new design, a pair of olive-drab gloves, a pair of marching shoes as adopted by the United States Army, and an olive-drab shirt. It is not advisable to purchase any of these articles before entering College, as the necessary uniformity in style, material, etc., makes it necessary to insist upon articles that conform to the standard set by the department. All of these articles can be purchased cheaper here than they can at other places on account of special arrangements made.

Students must come prepared to deposit the price of the uniform, for which they will be measured as soon as they learn the position of a soldier.

Proficiency in Military department is a requisite to graduation.

Military Drill 1. Freshman year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 2. Freshman year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 3. Sophomore year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 4. Sophomore year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 5. Junior year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 6. Junior year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 7. Senior year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 8. Senior year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 9. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. First semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 10. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. Second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill A. First semester; first year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill B. Second semester; first year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill C. First semester; second year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill D. Second semester; second year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill E. First semester; third year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill F. Second semester; third year; Vocational Course; 1 credit; 1 hour of practical drill on each drill day.

Special and optional students will be given credits in military drill as indicated above for undergraduate students. For their first semester's drill work they will be given credits in Military Drill 1. For their second semester's drill work they will be given credit in Military Drill 2. In the following years they will be given credits correspondingly.

1. **Theoretical Instruction.** This instruction consists of recitations in Infantry Drill Regulations, Field Service Regulations, Manual of Guard Duty, and Army Regulations; instruction in military correspondence and reports and returns; lectures on military subjects that pertain to the organization and administration of the United States military forces in peace and in war; and the Military Policy of the United States.

Military Science 1. Junior year; first semester; 1 credit; 1 recitation or lecture.

Military Science 2. Junior year; second semester; 1 credit; 1 recitation or lecture.

The McAlexander Banner, Brodie Banner, Sigmund Eisner Banner and the Henderson Ames Banner are beautifully decorated silken banners donated to the Military Department for the purpose of creating a friendly spirit of rivalry in the regiment.

The McAlexander Banner. This banner was presented by Major U. G. McAlexander, Infantry, U. S. Army, Commandant of Cadets 1907 to 1911 and since September 1, 1915, and is to be carried as a mark of merit by the battalion making the highest total number of credits in competitive drill each drill year.

The Brodie Banner. This banner was presented by Professor R. K. Brodie, O. A. C., and is to be carried as a mark of merit by the company of the regiment making the highest total credits in competitive drill each drill year.

The Sigmund Eisner Banner. This banner was presented by Sigmund Eisner, Red Bank, New Jersey, and is to be carried as a mark of merit by the company of the First Battalion making the highest total number of credits in competitive drill in that battalion each drill year.

The Henderson Ames Banner. This banner was presented by the Henderson Ames Company, Kalamazoo, Michigan, and is to be carried by the company of the Second Battalion making the highest total number of credits, in competitive drill, in that battalion each drill year.

MODERN LANGUAGES

LOUIS BACH, Professor

MELISSA MARGARET MARTIN, Instructor

The department of Modern Languages is prepared to offer courses of three years in French, German, and Spanish.

In harmony with all other courses of the College, the final aim of the instruction is practical use for the various spheres of activity and pursuits of life. While the disciplinary and cultural values of language study are duly recognized and emphasized, the predominant purpose, all the time and everywhere, is the development of personal power for social service.

The method of teaching suits the end in view. It is independent, to a great extent, of the text-books used, much time being spent on oral drill, and each new point of theory being illustrated by copious examples and conversational exercises. Ear, eye, and tongue are equally trained. The study of grammar, at the same time, is made to serve as a course in applied logic. Learning all about subject, predicate and object, together with their various modifiers, rendering a clear account of the relations that words bear to one another, when put together in sentences, the student necessarily brings order into his reasoning power, substituting definite, fundamental conceptions for vague and hazy fancies. Furthermore, by constantly comparing new words and modes of expression with similar ones in his own language, by applying familiar grammatical principles to a new field of effort, by abundant translating from one idiom into the other, the student is sure to gain a deeper and more comprehensive understanding of modern English than could be obtained in any other way. Appreciation comes through comparison.

A certain amount of specified work in a language is definitely required by some departments. In other departments, German, French, or Spanish may be taken as electives, and when so taken, the student receives full credit for one year's work.

Students who have had two years of high school German, French, or Spanish, are ready to enter the corresponding second year class in College, one year's work in College being equivalent to two years in the high school. With one year's work in the high school, the student is entitled to enter the second semester of the first year class.

FRENCH

101. Elementary French. Grammar, oral and written exercises; reading of easy prose.

First semester, 3 credits; 3 recitations.

102. Elementary French. A continuation of course 101.

Prerequisites: Mod. Lang. 101 or one year of high school French.

Second semester; 3 credits; 3 recitations.

103. Intermediate French. Advanced grammar, composition, reading of narrative, description and scientific prose; conversational exercise on all sorts of topics.

Prerequisites: Mod. Lang. 101 and 102, or two years high school French.

104. Intermediate French. Continued; the same plan of work as course 103.

Prerequisites: Mod. Lang. 101, 102, 103.

Second semester; 3 credits; 3 recitations.

107. Advanced French. Selections from the various classes of literature specially suited to the particular needs of the class. Composition and conversational exercises based on the texts in use.

Prerequisites: Mod. Lang. 101, 102, 103, 104.

First semester; 2 credits; 2 recitations.

108. Advanced French. Continued on the same plan as course 107.

Prerequisites: Mod. Lang. 101, 102, 103, 104, 107.

Second semester; 2 credits; 2 recitations.

GERMAN

201. Elementary German. Grammar, oral and written exercises, reading of easy prose.

First semester; 3 credits; 3 recitations.

202. Elementary German. A continuation of course 201.

Prerequisite: Mod. Lang. 201 or one year high school German.

Second semester; 3 credits; 3 recitations.

203. Intermediate German. Advanced grammar, composition, reading of narrative, descriptive and scientific prose; conversational exercises on all sorts of topics.

Prerequisites: Mod. Lang. 201, 202 or two years high school German.

First semester; 3 credits; 3 recitations.

204. Intermediate German. A continuation of course 203.

Prerequisites: Mod. Lang. 201, 202, 203.

Second semester; 3 credits; 3 recitations.

207. Advanced German. Reading of texts from the various classes of literature, composition and conversational exercises on the texts used.

Prerequisites: Mod. Lang. 201, 202, 203, 204.

First semester; 2 credits; 2 recitations.

208. Advanced German. A continuation of course 207.

Prerequisites: Mod. Lang. 201, 202, 203, 204, 207.

Second semester; 2 credits; 2 recitations.

SPANISH

301. Elementary Spanish. Grammar, oral and written exercises, reading of easy prose.

First semester; 3 credits; 3 recitations.

302. Elementary Spanish. A continuation of course 301.

Prerequisite: Mod. Lang. 301 or one year high school Spanish.

Second semester; 3 credits; 3 recitations.

303. Intermediate Spanish. Advanced grammar; composition; reading of narrative and descriptive texts; conversational exercises on all sorts of topics.

Prerequisites: Mod. Lang. 301, 302, or two years high school Spanish.

First semester; 3 credits; 3 recitations.

304. Intermediate Spanish. A continuation of course 303.

Prerequisites: Mod. Lang. 301, 302, 303.

Second semester; 3 credits; 3 recitations.

307. Advanced Spanish. Reading of texts from various classes of literature; composition and conversational exercises based on the texts in use.

Prerequisites: Mod. Lang. 301, 302, 303, 304.

First semester; 2 credits; 2 recitations.

308. Advanced Spanish. A continuation of course 307.

Prerequisites: Mod. Lang. 301, 302, 303, 304, 307.

Second semester; 2 credits; 2 recitations.

PHYSICAL EDUCATION

————— Director, Professor of Physical Education

PHYSICAL EDUCATION FOR MEN

J. A. PIPAL, Professor of Physical Education for Men, Football Coach.
RALPH MADISON PAVEY, Instructor
JAMES GEORGE ARBUTHNOT, Instructor

Athletics. All College athletic contests are under the jurisdiction of the athletic board, composed of two members of the faculty, two members of the student body, and one alumnus.

Direct and active supervision comes from the athletic board, which supports representative teams in football, basketball, wrestling, track and baseball, and awards monogram "O's" to members of these teams. The most efficient coaches are furnished to all of these teams, while assistants teach the theory and practice of the various sports to freshmen and other teams.

The new gymnasium will furnish to the students at the Oregon Agricultural College the most modern and complete equipment for specializing in indoor sports, while the new athletic field includes a new quarter-mile track, football field, and baseball diamond.

The armory, one of the largest of its kind in the United States, provides fine facilities for winter training in football, track, baseball, and the various other outdoor sports. An indoor track, banked at the turns, which is but eight laps to the mile, furnishes facilities which are proving a great aid in shaping all of the teams into condition.

Gymnasium Work. Because physical health determines capacity for efficiently carrying out work which a student prepares for in college, the importance of Physical Education in the modern educational institution is being emphasized more and more every year. The functions of this department are: (1) to develop organic power, the basis of vitality, necessary to physical and mental efficiency; and (2) to secure and maintain a good posture, harmonious muscular control, and a reasonable degree of scientific training for expert gymnasium and field athletic work.

The new gymnasium for men, two units of which have been completed, is equipped with all of the modern gymnastic apparatus and facilities for properly carrying on the work in physical education and recreation. The floor, 90x150 feet in dimensions, furnishes ample space for the most efficient type of gymnasium work.

Features of the new gymnasium which will add to its attractiveness will be two regulation-sized handball courts; two squash courts; three basketball courts; regulation-sized, padded rooms for boxing and wrestling; bowling alleys; steel lockers to accommodate all the men students; modern hygienic showers, steaming rooms, hot rooms, etc., for scientific care of the body.

The treasurer's receipt for the \$1.50 gymnasium fee entitles the holder to registration at the gymnasium office for full privileges of the gymnasium, including physical examination, chart of measurements, strength test, locker, free towels, etc.

On the basis of the physical examination, special work of such a nature as the student's physique demands will be assigned, and a careful plan outlined for the symmetrical development of the body.

Membership and regular practice on any of the varsity squads is accepted as an equivalent for gymnasium work during the active practice season, the attendance being reported weekly.

Fall Work. Instruction is given in both theory and practice of Physical Education. During the warm weather of the first semester the department emphasizes the desirability of outdoor work, furnishing a large and efficient corps of instructors in football, basketball, tennis, volley ball, soccer, field hockey, swimming, cross country, track athletics, etc.

Winter Work. The active gymnasium work starts with the beginning of the fall rains, about October 15, when outdoor work is no longer convenient. The work prescribed is intended to correct cases of scoliosis, flat-foot, flat chest, round shoulders, and any other deformity which is susceptible of improvement through corrective medical gymnastics.

Recreative games, such as basketball, handball, indoor baseball, wrestling, boxing, indoor tennis, volley ball, etc., are also conducted during the winter period.

Spring Work. In the spring, full advantage will be taken by the gymnasium instructors of the opportunity for cross-country runs, track and field work, and out-door games with the classes, during which occasions correct methods of breathing, form in running, and proper carriage of the body will be emphasized.

Equipment. The general equipment available for men includes the new men's Gymnasium, the Armory, the athletic field and the swimming pool in the Y. M. C. A. building. The men's gymnasium

is equipped with lockers and dressing rooms having accommodations for all of the men of the College. In the shower-bath room hot and cold water is available throughout the year, and free towels are furnished to the students. The main floor space provides for basketball and other indoor games. The equipment includes horizontal bars, parallel bars, vaulting horses and bucks, swinging rings, traveling rings and ladders, Swedish wands and stall bars, climbing ropes, mats, dumb-bells, Indian clubs, and chest weights. The athletic field adjoining the gymnasium on the south, has within its bounds a quarter-mile running track, football gridiron, and baseball diamond. Bleachers and a grandstand accommodate the spectators.

Normal Course. Many students expect to take up the profession of teaching after graduation from college. A general knowledge of the theories of physical education and methods of gymnastics and athletic instruction is often of material assistance in securing important teaching positions.

Students showing an especial aptitude and interest in physical education will be admitted to this course. The work will include lectures on the history and development of physical training, the general physiological principles of exercises, methods of teaching, and first aid to the injured. Calisthenics, gymnastic drills, apparatus work, games, and athletics will comprise the practical work of the course.

Elective; hours and credits subject to arrangement.

All sophomores, freshmen, and students of the Vocational courses, unless physically unable, are required to take physical training. The classes meet twice a week for sixty-minute periods.

One-half credit per semester is allowed for this work, and is a requirement toward graduation.

COURSES IN PHYSICAL EDUCATION FOR MEN

11. First year Vocational; first semester; 2 periods; $\frac{1}{2}$ credit.
12. First year Vocational; second semester; 2 periods; $\frac{1}{2}$ credit.
13. Second year Vocational; first semester; 2 periods; $\frac{1}{2}$ credit.
14. Second year Vocational; second semester; 2 periods; $\frac{1}{2}$ credit.

15. Freshman year; first semester; 2 periods; $\frac{1}{2}$ credit.
16. Freshman year; second semester; 2 periods; $\frac{1}{2}$ credit.
17. Sophomore year; first semester; 2 periods; $\frac{1}{2}$ credit.
18. Sophomore year; second semester; 2 periods; $\frac{1}{2}$ credit.
19. **Hygiene.** This course consists of a series of lectures on

general hygienic subjects, covering such points as sleep, light for study, colds and catarrh, with a general consideration of social and personal hygienic topics.

Freshman year; first or second semester; $\frac{1}{2}$ credit.

PHYSICAL EDUCATION FOR WOMEN

MIRIAM THAYER-SEELEY, Professor of Physical Education for
Women
CHARLOTTE LEWIS-NELSON, Instructor
BERTHA GERALDINE BOWLES, Instructor
IRENE TELFORD, Instructor

Purpose. The aim of this department is to bring each student to her best possible physical condition, and by a careful system of gymnastic training to correct faulty posture, to aid in the formation of habits of hygienic living, to establish a normal condition in the circulatory and respiratory systems, to secure bodily vigor, and to attain a healthy and symmetrical development, rather than the greatest increase in mere muscular power.

Special Corrective and Medical Gymnastics. Students who are shown by their physical examinations to be unfit for the work of the regular classes in gymnastics and sports, or to have physical defects, will be assigned to corrective classes where the work is light and the emphasis is laid on correct breathing and posture, relaxation and rest; or, whenever necessary, students will be given private work in medical or corrective gymnastics according to their individual needs. Thus the physical condition of each student is carefully diagnosed and supervised. The instructors encourage conferences concerning matters of health, personal and sex hygiene, and as far as possible advise proper treatment for the student's temporary ailments. They also take care of the emergency and first aid work for the women of the College.

Requirements. Work in physical education is required of all women four periods a week in all full-year, special, optional, music and vocational courses, regardless of the student's course or classification. One credit a semester is granted for this work. After the satisfactory completion of two years' regular work, the courses will be made elective or optional for women who pass a satisfactory physical examination and have a correct posture and carriage.

Corrective gymnastics will be prescribed for all others, credit being allowed on the basis indicated above. At least four credits are required in Physical Education toward graduation.

Persons presenting credentials of work in physical education taken elsewhere may be given credit for such work in so far as it is equivalent to the requirements of this institution.

Costumes. In order that the gymnasium costumes be hygienic and uniform, a regulation suit and shoes are required of all students. The shoes, orthopedic, are sold by the local dealers, subject to the approval of the director; price \$3.00. The suits should be ordered at the gymnasium office, immediately upon arrival at the College. Good second-hand uniforms of outgoing girls will be for sale at about \$4.00, while the new uniforms cost \$5.00.

The Women's Gymnasium is equipped with lockers and dressing rooms having accommodations for every College woman. A room for corrective gymnastics and a rest room, on the ground floor, are adequately equipped for their respective purposes. In the shower-bath room, hot and cold water is available throughout the year, and free towels are furnished to the students. The floor of the gymnasium is surrounded by a balcony running-track, and a capital playing space is provided for basketball and other indoor games.

The equipment includes horizontal bars, vaulting horses and bucks, parallel bars, swinging rings, traveling rings, Swedish box, stall bars, climbing ropes, ladders, dumb-bells, Indian clubs, and wands.

The girls' athletic field provides facilities for such games as baseball, cross ball, basketball, soccer, field hockey, and tennis.

FEES

PHYSICAL EDUCATION

All courses\$1.50

(All women pay the fee of \$1.50 per semester for which they are given use of all equipment, lockers, baths; are furnished with towels, medical supplies for injuries, and are given first aid, massage and physical examinations.) ?

The following courses are offered:

A. Required Courses. In the regular courses in Practical Gymnastics a variety of work is taught. Both the Swedish and

German systems of gymnastics are used, and the best in both is adapted to the needs of the classes. Much emphasis is laid on correct posture and breathing. During her first two years of college work each student, irrespective of classification, if not required to take corrective gymnastics, must be enrolled in courses 5, 6, 7 and 8, in which the practical work in Phys. Ed. is divided as follows:

Two periods a week in practical gymnastics.

Two periods a week in elective courses. (These may be chosen according to needs or desire of students, from the list of elective courses described below.)

5. Practical Gymnastics (and Electives.)

Required of all students; first semester; first year; four hours a week; 1 credit.

6. Practical Gymnastics; (and Electives.)

Required of all students; second semester; first year; four hours a week; 1 credit.

Prerequisite: Course 5.

7. Practical Gymnastics (and Electives.)

Required of all students; first semester; second year; four hours a week; 1 credit.

Prerequisites: Courses 5 and 6.

8. Practical Gymnastics (and Electives.)

Required of all students; second semester; second year; four hours a week; 1 credit.

Prerequisites: Courses 5, 6 and 7.

26. Corrective Gymnastics.

Required of all students who have need of remedial work.

Special attention is given to those having spinal curvature, round shoulders, narrow chests, forward heads, weak backs, pronated ankles, and other physical defects or weaknesses.

10. Hygiene.

Required of all Freshmen.

One lecture a week; $\frac{1}{2}$ credit.

B. Elective Courses.**I. Practice**

Credit in these elective courses is given according to the number of periods taken each week, $\frac{1}{4}$ credit being given for each period.

27. **Outdoor Sports.** Soccer, playground ball, cross ball, base crick, track athletics, etc. Open to all students.

28. **Basket Ball.** Open to all students physically qualified.

29. **Soccer.** Open to all students.

30. **Baseball.** Open to all students.

31. **Indoor Baseball.** Open to all students.

32. **Hockey.** Open to all students.

33. **Advanced Gymnastics (and Electives.)** Open to specials in Physical Education and, by permission, to such other students as are qualified.

Prerequisites: Courses 5, 6, 7, and 8. Four hours a week; 1 credit.

34. **Tennis.** Open to all students.

35. **Swimming.** Open to all students.

36. **Fencing.** Open to all students who have satisfactorily completed courses 5 and 6.

37. **Indian Clubs.** Open to all students.

38. **Aesthetic Dancing. (Elementary.)** Open to all students. The purpose of this course is to develop grace and freedom of movement. Greek dancing, now considered one of the most important phases of gymnastic exercise, is emphasized.

39. **Aesthetic Dancing. (Intermediate.)** Open to all students who have completed course 38.

40. **Folk Dancing.** Open to all students. In this course are taught a variety of peasant and national dances suitable for recreation or teaching.

44. **Archery.** Open to all students.

II. Theory

41, 42. **Theory of Gymnastics.** (Open to students who contemplate teaching gymnastics.) Lectures, recitation and practice teaching.

Two periods a week; 41 first semester, 42 second semester; 2 credits each semester.

43. Play and Playground Games. Open to all Summer School students.

Five periods a week for summer session; 2 credits.

This course is designed for public school teachers or students interested in playground work, or wishing to specialize in Physical Education. The psychology of play, adaptation of play to varying ages, necessity of supervision of play, simple equipment for school playgrounds, organization of games, will be given briefly. The greater part of the time, however, will be given to the practice of various playground games and simple folk dances.

47, 48. Massage. Theory and practice.

One lecture, one laboratory period; 1 credit each semester; 47 first semester, 48 second semester.

Prerequisites: Anatomy and Physiology.

49, 50. Physical Examination and Prescription of Exercises. Open to students specializing in Physical Education.

One lecture; one laboratory period; 1 credit each semester; 49 first semester, 50 second semester.

Prerequisites: Anatomy and Physiology.

51, 52. Methods and Practice Teaching. Open to students specializing in Physical Education.

Lectures, recitations, and teaching.

Prerequisites: Courses 41 and 42.

Two periods a week; 2 credits each semester; 51 first semester, 52 second semester.

53, 54. Organization and Administration of Playgrounds. Open to students desiring to teach Physical Education.

Two periods a week; 2 credits each semester; 53 first semester, 54 second semester.

SPECIAL WORK IN PHYSICAL EDUCATION

An arrangement of courses will be made for women desiring to specialize in Physical Education, either with the purpose of teaching it in connection with their Home Economics or other courses in the schools of the State; or with the desire of securing a thorough foundation for continuation of this line of study.

There are two distinct kinds of courses necessary for the special study of Physical Education: I. Theory; II. Practice.

I. Theory

High school preparation advised: Physiology, Physics, Chemistry, Latin, German.

College courses recommended: Zoology (101, 102), Physiology and Anatomy (201, 202), English (31, 32), Expression (206, 207), German (three years, or a knowledge sufficient to study scientific and medical works), Theory of Gymnastics (41, 42), Embryology and Histology (104, 105), Neuro-Physiology (209), General Psychology (101), Educational Psychology (102), Dramatic Interpretation (208, 209), Story Telling (191, 192), American Literature (71, 72), Home Nursing (511), Massage (47, 48), Physical Examination and Prescription (49, 50), Organization and Administration of Playgrounds (53, 54), Methods and Practice Teaching (Phys. Ed. 51, 52), Sociology (250), Education (131).

II. Practice

Practical Gymnastics (5, 6, 7, 8), Advanced Gymnastics (33), Corrective Gymnastics (26), Aesthetic and Folk Dancing (Elementary and Advanced), Fencing (Elementary and Advanced), Swimming (Elementary and Advanced), Sports of all kinds.

PHYSICS

WILLIAM BALLANTYNE ANDERSON, Professor
WILLIAM ALFRED BEVAN, Assistant Professor
GILBERT BRUCE BLAIR, Instructor
JOHN HARRISON BELKNAP, Instructor

An endeavor is made to adapt each course to the needs of those taking it. The Engineering students use a text which seems to be the best available for their needs; while the text used by the Agricultural students was written especially for such students. The "Physics of the Household" was likewise written especially for students of Home Economics.

In all courses the practical side of the subject is emphasized both in lecture and in laboratory work. At the same time the theory of the subject, is so far as it deals with the fundamental principles of Physics, receives the attention that its importance demands.

Since Physics and Chemistry are the two basic sciences, it would seem that every College graduate should have had at least a general course in each of these subjects. The department, accordingly, urges that at least all College students who have not had Physics in high school elect some work in Physics after consultation with the head of the Department of Physics. Those expecting to teach Physics in the high schools should by all means take several courses in College Physics.

Equipment. The physical laboratory has a good working equipment for the study of general physics, the apparatus being such as to allow a qualitative or quantitative verification of the most important laws of physics by the student in the laboratory, and by the instructor in the lecture room. In addition to the general laboratory, the department has two special laboratories, one equipped for electrical measurements and the other for photometry. A partial list of the apparatus found in these follows: standard cells, shunts, capacities and inductances; secohmeter; Leeds and Northrup potentiometer; Siemens and Halske standard ammeters, voltmeter, and portable testing set; Paul unipivot testing set; storage cells of large current capacity for ammeter and wattmeter calibrations; 10½-inch spark coil; Gaede pump; large Tesla coil; Leeds and Northrup photometer fitted with lamp rotator, rotating sector, Lummer-Brodhum screen, and Bechstein flicker photometer.

In the General Library will be found many recent Physics texts and allied works, as well as several Physics Periodicals, which are available to all.

The following courses are offered:

A. Elementary Physics. An elementary or high school course in physics.

The vocational course in Mechanic Arts; third year; first semester; 3 credits; 3 recitations; 1 laboratory period.

Fee: \$2.00.

B. Elementary Physics. A continuation of course A.

Second semester; 3 credits; 3 recitations; 1 laboratory period.

Fee: \$2.00.

1. General Physics. A course in general physics, descriptive rather than mathematical in character, covering the subjects of mechanics and heat.

Prerequisites: Elementary physics; geometry.

The courses in Agriculture and Electrical Engineering; freshman year; the courses in Forestry and in Industrial Arts, sophomore year; elective in the course in Commerce, freshman year; first semester; repeated second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period.

Text: Anderson: Physics, Vol. I.

Fee: \$2.00.

2. General Physics. A continuation of course 1 covering the subjects of sound, light, electricity, and magnetism.

Prerequisite: Physics 1.

Required as listed under course 1; second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period.

Text: Anderson: Physics, Vol. II.

Fee: \$2.00.

101. Engineering Physics. A course in mechanics and heat.

Prerequisite: Trigonometry.

The course in Highway Engineering, Irrigation Engineering, Logging Engineering, Mechanical Engineering, and Mining Engineering; sophomore year; first semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period.

Text: Reed & Guthe: Physics.

Fee: \$2.00.

102. Engineering Physics. A continuation of course 101, covering the subjects of electricity and magnetism, sound and radiation.

Prerequisite: Physics 101.

Sophomore year; second semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period.

Text: Reed & Guthe: Physics.

Fee: \$2.00.

105. Electrical Physics. An advanced course in general physics.

Prerequisites: Physics 1 and 2; trigonometry.

The course in Electrical Engineering; sophomore year; first semester; 3 credits; 1 lecture; 2 recitations; 1 laboratory period.

Fee: \$2.00.

106. Electrical Measurements. A continuation of course 105, in which the study and use of electrical measurements is emphasized.

Prerequisite: Physics 105.

The course in Electrical Engineering; sophomore year; second semester; 3 credits; 1 lecture; 2 recitations; 1 laboratory period.

Fee: \$2.00.

131. Household Physics. A brief descriptive course with such applications as are of greatest interest to students in Home Economics.

The course in Home Economics; sophomore year; first semester; 4 credits; 3 lectures; 2 recitations; 1 laboratory period.

Text: Lynde: Household Physics.

Fee: \$2.00.

201. Electrical and Magnetic Measurements. A laboratory course in the exact determination of electrical and magnetic quantities, calibration of instruments, etc.

The course in Electrical Engineering; junior year; first semester; 2 credits; 1 three-hour laboratory period.

The course will be repeated during the second semester, as an elective, should a sufficient number of students apply.

Fee: \$2.00.

202. Electricity and Magnetism. An advanced course, taking up the theory of electrical measuring instruments, etc., with suitable practice in the laboratory.

Elective; credit to depend on work done.

Fee: \$2.00.

211. Heat and Light. An advanced course, taking up the phenomena of heat and light in detail, including recent discoveries.

Elective; credit to depend on work done.

Fee: \$2.00.

220. Descriptive Astronomy. A brief elementary course in astronomy designed to acquaint the student with the most important facts relating to the heavenly bodies. The object of the course is to make the student an intelligent observer of the more common astronomical phenomena. Descriptive rather than mathematical in character.

Elective; second semester; 2 credits; 2 recitations or equivalent in lectures and observation work, depending upon weather conditions.

222. Wireless Telegraphy. A study of electric waves, their measurement, and their application to practical wireless telegraphy.

Prerequisites: Math. 51, 52; E. E. 101.

The course in Electrical Engineering; junior or senior year; elective; second semester; 3 credits.

Fee: \$2.00.

SUMMER SESSION

The chief purpose of the Summer School is to afford an opportunity for study to those unable to attend during the academic year. The courses are arranged for elementary and secondary teachers interested in Agriculture, Commercial branches, Home Economics and Manual Training; for credit in regular college subjects, as well as for prospective students deficient in entrance credit; for those interested in music and art; and for those desiring practical instruction in agriculture, household economics, and woodwork.

Of special interest is the inclusion in the two-weeks calendar of courses for boys and girls of upper grammar grades and high school age. At this formative period, an opportunity to study in an interesting way the problems of the two great fundamental occupations should arouse new ideals of the beauty, importance, and significance of such callings. The romance, as well as the dignity of agricultural and home pursuits have their appeal to youthful imagination, but ordinary school education, both consciously and unconsciously, places the emphasis on the professions and occupations leading to a public career.

A large faculty, chiefly regular College instructors, supplemented by a number of specialists from Oregon public schools and from other states, the extensive equipment in class rooms, laboratories, libraries, shops, and experimental fields, are at the service of the students.

The state-wide interest in garden and household contests of the public school pupils has resulted in a demand for more knowledge of these industrial subjects on the part of the teachers. The summer courses will not only provide specific and detailed instructions for conducting these contests, but will show the teacher how to use the state-adopted text in elementary agriculture and supplement it with simple and interesting experiments both indoors and outdoors. In the same way, the direct and practical instruction in cooking and sewing will furnish the essentials for assisting the girl pupils. Any teacher who has had the advantage of six weeks' contact with expert instructors and practical demonstrations in the work in which he is to direct his pupils, will greatly multiply his efficiency and usefulness in his community.

The winter short course comes at a time best suited to the convenience of the farmer. Professional and business men find their slack season during the summer; so also do the youths who are attending school, and the women of the family. The summer school offers them the opportunity of some study of the problem nearest every town dweller's heart—the acquirement of a piece of land and its cultivation. From the standpoint also of the beautification and sanitation of the dooryard and home premises, the kitchen-garden, house decoration, hygienic and economic preparation of foods, and other indoor problems, the summer school makes its appeal. Young men and women who are through high school, and others undecided as to their life work, may find just the leadings in summer study which will determine their future vocation.

RAILROAD RATES

To those attending the summer school, the railroad companies grant a special rate of one and a third fare for the round trip, on the certificate plan. In order to receive the benefit of the reduction, the purchaser must pay full fare to Corvallis, **securing a receipt from the ticket agent** at the time of purchase. This receipt must be countersigned by the College secretary at Corvallis, and on presentation to the ticket agent at Corvallis will secure rate of one-third for the return. This special rate takes effect three or four days before the opening date of the summer session and remains in force until the same length of time after the closing date. Tickets on this plan may be secured at any time while the school is in session, and are also good for return at any time.

ADMISSION AND EXPENSES

There are no entrance examinations or other educational tests for admission. Students desiring College credit must do the required work and pass satisfactory examinations at the close of the session. The registration fee of five dollars entitles the student to admission to as many courses as he cares to attend during the entire session. Private, individual lessons in music will be given at the regular price charged during the school year; students taking music only, will not pay the College registration fee.

The College dormitories, Waldo for women and Cauthorn for men, will accommodate over two hundred students with board

and lodging. A charge of five dollars will be made to cover the cost of heat, light, use of laundry, etc. The rooms are provided with bed, mattress, table, and chairs. Each room has closet, hot and cold water, and electric light. Each student who desires to occupy one of these rooms must bring bed, pillows, pillow-cases, sheets, blankets or comfort, bed-spread, towels, napkins, and soap. The laundry room will be open for the use of students at Waldo Hall without extra charge.

Table board will be furnished at Waldo Hall at three and one-half dollars per week. Lists of private lodging and boarding places will also be provided and every assistance rendered in finding satisfactory accommodations. Furnished rooms for light housekeeping may also be had.

Allowing \$26.00 for board and room, \$5.00 registration fee, and 50c for drayage on baggage, \$3.50 for laundry and incidentals, the minimum cost for the entire six weeks need not exceed \$35.00, exclusive of railroad fare. Those who take courses requiring textbooks must make some additional allowance, and others for small laboratory fees, but it is safe to estimate the absolutely necessary expenses, textbooks and all, under \$50.00.

SOCIAL AND OTHER FEATURES

The informal and recreation diversions from the class and study routine have not only a social but an educational value as well. These are so controlled and directed as to be inexpensive and unobtrusive. Opportunity for students to become acquainted with each other and with the instructors outside the class room may be had each evening at Waldo Hall, during the informal social hour and at the formal receptions and parties each week.

The College numbers among its faculty some of the best known popular lecturers in the State. Several will be heard in illustrated stereopticon addresses on interesting phases of Oregon's industrial development. At least once each week an evening will be given up to entertainment, either in the form of a lecture of general interest, or a musical concert.

The tennis courts, baseball field, golf course, gymnasium, and other recreation resources of the institution may be used by the students and instructors, free of charge. Boating on the Willamette and Mary's rivers, picnics and excursions to various points of

interest, including Mary's Peak, and week-end trips to the ocean at Newport, will also be available for those who desire to indulge in these recreations. The social features of the Summer School are given careful attention, so they may not come in conflict with the regular work, but at the same time be full of pleasure and interest.

SPECIAL ILLUSTRATED BULLETIN

Each spring, special circulars are issued, giving complete description of the various courses offered, statement in detail of living and other expenses, list of instructors, directions for registration, and other matters. These bulletins are illustrated with interesting views of the College campus. Copies may be obtained by addressing the Oregon Agricultural College, Corvallis, Oregon.

WINTER SHORT COURSES

For many years the Oregon Agricultural College has offered each winter one or more courses of lectures and demonstrations which have been known as Winter Short Courses. These courses have been so generally successful and have called forth so many expressions of approval from those in attendance, that the work has expanded until several courses are given in each of the following schools:

School of Agriculture.

School of Home Economics.

School of Forestry.

School of Engineering.

School of Commerce.

Each of these courses, except the one in Industrial Arts, which will consist entirely of practical work in the shops or in the draughting room, will consist of a series of lectures supplemented by demonstrations, and by practical exercises in the dairy, the orchard, and the various laboratories. The work is so arranged that each hour of the day, from 8 until 5, may be filled with lectures and laboratory or field demonstrations.

The work offered will be adapted to the various needs of farmers, fruit growers, dairymen, mechanics, or of women in the home. It is believed, also, that teachers who desire to prepare themselves to teach Elementary Agriculture, now required in our public schools, will find these courses decidedly helpful.

The various courses are so planned as to provide the largest amount of practical information in the short time available. The subjects to be discussed are those in which every farmer should be interested, and the aim will be to present them in the most practical manner possible. The laboratory and collections, the shops, the creamery, the orchards, the College farm, the cutting, fitting, and sewing rooms; the dining rooms and kitchens—all offer facilities for demonstration or for practical exercises by the students attending these courses. A pleasing and profitable feature of these courses will be a series of lectures by prominent men who are qualified by successful experience to speak upon some particular phase of Agriculture.

Special lessons in Music may be taken by short course students at the regular rates listed under the School of Music.

Students should report to the Registrar for registration and for assignment to the various classes. The inclusive dates of these short courses are as follows: Winter Short Courses, January 7 to February 1; Forestry Short Course, November 6 to April 13. A list of boarding and lodging places may be consulted at the office of the Y. M. C. A.

No entrance examination or other educational test will be required; but no one will be received who is less than sixteen years of age.

There will be no fees whatever for attending the exercises of Farmers' Week. Those who attend the other courses will be expected to pay a registration fee of \$1.00. In addition, students who elect certain courses will be expected to pay small fees, to cover the cost of materials used.

Board and lodging may be had in Corvallis at \$4.50 to \$6.00 a week.

Railroad Rates. The railroad companies grant a rate of one and one-third fare for the round trip on the usual certificate plan.

A circular descriptive of all Short Course work will be issued about November 1, and may be obtained by addressing the Oregon Agricultural College, Corvallis, Oregon.

AGRICULTURE

The school of Agriculture offers to its Short Course students instruction in the following courses; viz., Farm Crops, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Horticulture, and Crop Pests. In addition to these courses, students are advised to take advantage of the courses in Rural Economics which are offered in the School of Commerce, as well as the course in Rural Highways, in the School of Engineering. For more detailed information regarding these courses, write for descriptive circular mentioned above.

COMMERCE

Commercial Lecture Course. To meet the demand for a short, practical business course, the work outlined below will be offered in a series of lectures under the same conditions and entrance requirements as other winter courses.

Bookkeeping. This course will embrace the fundamental principles of double entry bookkeeping. It will be made strictly practical and only sufficient theory will be introduced to give the

student a firm foundation for his work. The basis of the work will be a study of a model general store equipped with the latest labor-saving methods of bookkeeping and office practice. Eight lectures and demonstrations.

Commerce Law. The course in Commercial Law will begin with the thought that there are certain fundamental principles of commercial law with which everyone should be familiar, and will include the following important subjects: property, contracts, negotiable instruments, interest and usury, bailment, agency and partnership, and real estate. Eight lectures.

Business Forms and Letter Writing. The purpose of this course will be to familiarize the student with various forms used in general business practice. Exercises will be required illustrating both principle and practice in a clear, simple understandable manner. In the work on letter writing the correct form, wording, and general arrangement of the business letter will be taken up. Original letters, received from the most important manufacturing concerns and business houses of the United States, will be studied. Eight lectures.

Penmanship. The work in penmanship will embrace the study and practice of the best forms and style of practical business writing. The primary aim of the course will be to develop an easy, rapid, legible business hand. Eight lectures a week.

Typewriting and Office Methods. The work in typewriting will be outlined to suit the requirements of the individual student. The beginner will be taught the correct method of fingering, the uses of the various parts of the machine, the care of the machine, manifold, and the correct arrangement of the typewritten letter or form.

Farm Accounting. A complete analysis of farm accounts by different methods, in which simplicity, accuracy, and labor-saving are emphasized; household and personal accounts; cost accounting and special records; cost of production; special cost records; labor records; milk records; poultry records; etc.; the farm plot; office methods; business organizations; business correspondence and business forms. Eight lectures and demonstrations.

Rural Law. The general principles of common and statutory law are discussed and explained; special phases of law affecting the farm, such as titles to real estate, deeds, mortgages, county records, etc.; landlord and tenant; eminent domain, and right-of-

way; water rights and boundaries; laws governing shipping, insurance, banking, etc.; court procedure. Eight lectures.

Rural Economics. The fundamental principles of production, distribution, and exchange with special reference to rural life. Rural labor problems, farm finance, legislative problems affecting rural life, cooperative organizations, marketing products, advertising, the economics of machinery, transportation, etc. Eight lectures.

Insurance. A brief survey of the essential features of the various life, accident, and fire insurance policies and insurance laws. Four lectures.

HOME ECONOMICS

These courses are designed for all women who are interested in the practical and scientific working out of household problems, and who are unable to avail themselves of a regular course in Home Economics. Many agricultural men and their sons, yearly take advantage of the Short Courses which deal with the problems of the farm, such as feeding of cattle, judging of corn, study of soils, etc. It is to meet the demand of Oregon women who are interested in the correct feeding of the family, the judging and selection of materials used in the home, the making of suitable and attractive clothing, and study of sanitary conditions which lead to the health, comfort, and happiness of the family, that this course has been established, and is to be carried on.

Food Preparation. This course deals with the subject of foods and food preparation in its scientific and economic aspect. It is the study of the nutritive principles as they are found in various foods, and the method of cooking foods to retain those principles in a form most completely and easily digested; serving of food in simple and attractive form; economy of money, time, and labor being the watchword.

Special Food Preparation. This course consists of the selection and preparation of foods for children of different ages, adults in active life, the aged, and invalids.

Home Management.

General health and welfare of the home.

- (a) Economy of time, labor, and income.
- (b) Sanitation of the home.
- (c) Home nursing.

Note.—These courses have been planned to meet the needs of those who have had previous work, as well as those who are entering for the first time.

Plain Sewing. This course is planned for those women wishing instruction in the economical purchasing and making of household linens and underwear; the mending and renovating of old garments usually found in all households; the draughting of patterns for underwear to the student's own measurements, together with the practice of interpreting and using purchased patterns.

All women are eligible to this course.

Dressmaking. This course offers instruction in the principles of dressmaking; the taking of accurate measurements; the draughting and use of patterns; the choosing and economical cutting of materials; the making of at least one dress, with special emphasis on artistic color combinations and suitable design.

Tests will be made showing the adulterations of textiles; and simple methods of detecting the adulterations in dress materials will be given.

This course is given for those women who have had experience in sewing and dressmaking.

Advanced Dressmaking. Students who have previously taken one winter's short course will be given instruction in advanced dressmaking, if they so desire.

Millinery. This work will be given by lectures and demonstrations only. No practice work will be given to the students.

Basketry. This course will be given three times each week.

Care of Children. Three lectures each week will be given on the care of children. Only mature women will be admitted to this class.

Camp Cookery. The course in Camp Cookery consists of two laboratory lessons each week. It is especially designed for men, but women are admitted if the class is not already full. Only twenty students can enter these classes.

ENGINEERING AND INDUSTRIAL ARTS

It is the purpose to teach the subjects offered in a straightforward, practical manner, which can be readily grasped and understood by farmers, mechanics, and others who have had only the advantage of a common school education.

Woodworking. Considerable latitude will be allowed in choos-

ing the particular line of work desired in this department as set forth under the following headings:

(a) A course for those not familiar with the care and handling of tools. This course affords instruction in the correct methods of using, sharpening, and caring for the tools of the carpenter's bench. The work is exemplified by exercises in planing, sawing, chiseling, and the construction of useful articles of furniture.

(b) The Steel Square and Its Use. This work includes laying out rafters, braces, stairs, and other work with the steel square. Lectures will be given on the use of the square, after which the actual construction of work will be undertaken by the student.

(c) Instruction in the use of paints, stains, and varnishes.

Blacksmithing. Two lines of work are offered in blacksmithing:

(a) Making repairs on machinery, tools, and farm implements. Students with no previous knowledge of blacksmithing are taught how to build and manage a forge fire; how to draw, bend, upset, forge, and weld iron; how to make chains, clevises, hooks, gate-hinges, whiffletrees and neckyoke irons, and other useful articles.

(b) A course in working and welding steel for those with some general knowledge of blacksmithing. This course includes a study of the different grades of steel; the effect of heat treatment on the quality and temper of steel; the use of the color scale in tempering; and finally the forging, dressing, and tempering of steel tools.

Road Building and Maintenance. A course of lectures on practical road construction and maintenance. This course will consist of three or more lectures each week during the short course on the fundamental principles of road construction and maintenance, and will include lectures on the following subjects: Alignment; grade; drainage; the road census and the interpretation of its results; selection of type of road; the earth, gravel, broken stone, and higher types of roads; maintenance of different types of roads; the road drag; road machinery; culverts and small bridges, etc.

Special laboratory work will be arranged for those desiring to study the physical properties of road building materials.

Concrete. A course of lectures will be given on the theory of concrete and on its practical application to farm and highway structures, walks, etc. In this course proper proportioning for different classes of work, proper aggregate, causes of failure, costs, and methods will be discussed.

THE SCHOOL OF MUSIC

The School of Music is a self-supporting department of the Oregon Agricultural College, organized in 1908 under the present management, and authorized at that time by the Board of Regents. The School has actively contributed to the artistic life and social enjoyment of the College community and of the city of Corvallis, the principals of the School of Music having had charge of the musical entertainment at all College functions of an official or ceremonial character, and of the important musical organizations of the city.

The studious atmosphere, wholesome discipline, and attractive environment of the Oregon Agricultural College are favorable alike to those just beginning the study of music and to advanced students, all of whom may begin their studies at any time and advance to graduation as rapidly as is consistent with creditable scholarship. Students not able to pursue their studies to graduation may have the privilege of selecting such studies as they desire, under conditions hereinafter explained. It is the mission of the School of Music to serve the commonwealth as efficiently as possible and at no greater expense than is charged in other educational institutions.

The advantage of studying music with instructors skilled in the psychology and practice of teaching cannot be overestimated. It results in an appreciable saving of time and expense and a maximum gain in efficiency. Hence the School of Music offers the following comprehensive courses of study to earnest students who wish to acquire scholarly musicianship at moderate cost. The courses may be begun at any time during the school year. All students may advance as rapidly as is consistent with good scholarship. The time required for completion of any of the courses is dependent upon the age, previous preparation, talent, ability, and character of work of each student.

FACULTY

DEPARTMENT OF VOICE

WILLIAM FREDERIC GASKINS, Mus. Bach.

Director of the School of Music.

Professor of Music.

Professor of Voice Culture, Singing, Conducting, Music History.

Graduate student Hillsdale College Conservatory; Graduate

student American Conservatory; Graduate student of

Karlton Hackett, Chicago; J. D. Mehan, New

York, F. X. Arens, New York.

GENEVIEVE BAUM-GASKINS

Instructor in Voice Culture and Singing.

Graduate American Conservatory, Chicago; Student of William

Nelson Burritt, New York; Karlton Hackett, Chicago; William

Frederic Gaskins, Chicago; John Dennis Mehan, New York.

DEPARTMENT OF PIANO

GENEVIEVE BAUM-GASKINS

Instructor.

Student of John J. Hattseaedt, Chicago; Graduate American

Conservatory, Chicago.

MAY BABBITT-RESSLER

Instructor.

Student of Arthur Foote, Boston; Leschetizky method studied with

Jeanne Marie Mattoon, New York.

CORINNE BLOUNT

Instructor.

Student of Emil Liebling, Chicago; and of Victor Garwood, of

The American Conservatory, Chicago.

DEPARTMENT OF ORGAN

GENEVIEVE BAUM-GASKINS

Instructor.

Student of Wilhelm Middleschulte, Chicago.

DEPARTMENT OF STRINGED INSTRUMENTS

E. HELLIER-COLLENS

Violin, 'Cello, Viola.

Instructor.

Graduate and Gold Medalist of Victoria College of Music, London, England; student of Dr. Adolph Brodsky, Royal College, Manchester, England; First Violinist of Royal Opera House Orchestra, Manchester, England; for three years Director of the Stringed Instrument department, University of Idaho School of Music.

DEPARTMENT OF THEORY

WILLIAM FREDERIC GASKINS, Mus. Bach.

Theory of Music. History of Music. Conducting.

CORINNE BLOUNT

Instructor.

Harmony, Harmonic Analysis, Advanced Harmony, Counterpoint, Composition.

DEPARTMENT OF BAND INSTRUMENTS

HARRY L. BEARD

Student of Herbert L. Clarke of Sousa's Band.

Instructor in Theory and Art of Playing Band Instruments.
Band Conducting.

COURSES IN MUSIC

In these courses the following subjects are included: elements of music, history of music, interpretation, languages, music form and analysis, music pedagogics, song singing, oratorio singing, opera singing, choral singing, organ playing, organ structure, piano playing, piano structure, sight reading, stage deportment, stringed instrument playing, wind instrument playing, brass instrument playing, theory, harmony, counterpoint, composition, voice culture.

The following courses are offered:

1. **Voice.** Exercises will be given for correct breath control; purity of tone production; freedom of action and blending of registers; articulation and correct pronunciation and enunciation of vowels and consonants; elements of phrasing and style. Students must appear on programs if requested, singing from memory, and attend all rehearsals and recitals unless otherwise instructed by the Director.

Required: Two lessons a week in voice practice with instrument one or two hours daily; sight reading and ear training, two hours a week; harmony and history of music, two hours a week each; choir and chorus practice. Physical education.

2. **Voice.** This course consists of exercises for tone placing; phrasing and style; legato, marcato, and portamento delivery. Physiology of the vocal mechanism. First year German, Italian, or French, at student's option unless otherwise advised by the Director. Songs and exercises of medium grade of difficulty. Attendance at recitals and rehearsals required, unless otherwise directed as above.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; harmony and counterpoint, two hours a week each; German, Italian, or French, as required in beginning work by the department of Modern Languages; physical education; choir and chorus practice.

Prerequisite: Course 1 or its equivalent.

3. **Voice.** This course includes the study of tone color, agility, the trill, *messa di voce*, recitation, declamation, phrasing, style; songs in English, German, French, Italian; the regular second year study of one of the above foreign languages at the student's option, in the department of Modern Languages, unless otherwise advised by the Director. Attendance at recitals and rehearsals

required unless otherwise directed as above, singing from memory on programs of the School of Music when so required.

Required: Two lessons a week in voice; two lessons a week each in advanced harmony and harmonic analysis; German, French, or Italian, at student's option, second year study as required in department of Modern Languages; choir and chorus practice; physical education.

Prerequisite: Course 2 or its equivalent.

4. Voice. This course includes advanced study of vocal technique by means of difficult exercises, songs, oratorios, operatic arias, declamation. Advanced composition throughout the year. Attendance at rehearsals required in preparation for public appearances, and at recitals, singing from memory. For graduation a public recital must be given as arranged by the Director, unless he may specify to the contrary. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 3 or its equivalent.

5. Piano Preparatory Course. For Beginners. Training of the hand, fingers, wrist, and arm. Extended preparation for scales and arpeggios; exercises for same. Chords. Octaves. Sonatinas by Clementi; Kuhlau; smaller compositions of Mozart, Handel, Beethoven, and other composers. Easiest sonatas of Haydn and Mozart. Selections from easier works of Schumann, Kullak, Reineke, and Grieg; other easy, appropriate compositions.

Required: Two lessons a week in piano; practice with instrument, one to three hours daily.

6. Piano. Scales and arpeggios, tempi, accent, nuance, rhythm. Double notes. Trill, Exercises for endurance, speed, accent, and rhythm. Etudes from Czerny, Kramer, Kullak, Krause, two-part inventions and dance forms by Bach. Easier sonatas of Haydn, Mozart, Beethoven. Easier compositions of Mendelssohn, Schubert, Schumann, Grieg, Raff, and others.

Required: Two lessons a week in piano; two lessons a week in harmony; two lessons a week in music history for thirty-six weeks; practice with instruments, two to four hours daily. Physical education.

Prerequisite: Course 5 or its equivalent.

7. Piano. Two- and three-part inventions and suites by Bach. Etudes of Czerny, Cramer, Hasert, Bernes. Sonatas of Beethoven

of moderate difficulty. Sonatas of Mozart. More difficult selections from Weber, Mendelssohn, Schumann, Chopin, Grieg, Liszt, Mozart concertos; transposition of easy hymns; to sight read readily; to play from memory five compositions from the preceding course in a satisfactory manner.

Required: Two lessons a week in piano; two lessons a week for thirty-six weeks in advanced harmony; two lessons a week in counterpoint; practice with instrument three to five hours daily. German or French. Physical education.

Prerequisite: Course 6 or its equivalent.

8. **Piano.** Collegiate Course: Well-tempered clavichord, chromatic fantasy and fugue, Bach. A limited number of etudes by Rubenstein, Chopin, Henselt. The more difficult sonatas of Beethoven. Solo works of Mendelssohn, Chopin, Schumann, Grieg, Liszt, Brahms. Concertos by Mozart, Mendelssohn, Beethoven.

Required: Two lessons a week in piano; practice with instrument three to five hours daily; two lessons a week in composition; one hour a week in harmonic analysis; German or French. Physical education.

To complete this course satisfactorily the student must fulfill the requirements above outlined and appear in programs when requested by the Director.

9. **Piano.** Graduate Course: Beethoven sonatas Op. 57, 106, 110. Liszt Rhapsodies. Comprehensive study of the principal classics and romantic composers. Solo works of modern composers. Concertos by Schumann, Chopin, Beethoven, and other composers.

Following is the list of graduate course pieces of which the student must play six from memory: Wagner-Liszt—Tannhauser March; Chopin—Scherzo in B Minor, op. 31; Mendelssohn—Rondo Capriccioso, op. 14, Prelude and Fugue in A Minor; Variations Serieuses; Schumann—Kreisleriana, op. 16, Carnival, op. 9; MacDowell—Marzwind and Wald Idyllen, op. 19, Nos. 1, 3, and 4; Bach—Fugue in A Minor, or his Italian Concerto; Handel—Suite in D; Moszkowski—Caprice Espagnol, op. 37; MacDowell—Concert Etude, op. 36; Grieg—Ballade; Liszt—Liebestod (Tristan and Isolde), Bach—Chromatic Fantasy and Fugue; Mozart—Fantasia in C Minor; Rubenstein—Sonata in F; Beethoven—Sonatas to be selected. Concertos by Chopin, Henselt, Hummel, Liszt,

MacDowell, Mendelssohn, Mozart, and Saint-Saens, or five other works at teacher's option.

Required: Two lessons a week in piano; practice with instrument three to five hours daily; advanced German or French. For graduation, students are required to perform publicly under the direction of the School of Music, playing a program not less than one hour in length, arranged by the instructor and approved by the Director, which shall include two or more numbers equal in difficulty to any composition in the list of graduate course pieces. A diploma will be issued upon the satisfactory completion of this course.

10. Theory. The course in theory will comprise systematic and progressive study in the science of music. Consideration will be given to the theories of acoustics, to notation, scales, keys, modes, sight reading, intervals, melodic progression, tempo, dynamics, rhythm, and ear training. Advanced theory will embrace harmony, counterpoint and subdivisions thereof, music history, concluding with form, composition, and orchestration.

11. Violin. This course is preparatory, and designed to develop correct fingering, free bowing, and accuracy as to pitch and rhythm and intonation.

Studies. Sevvick School, Greenberg, major scales, minor scales in the first position; studies by Wohlfahrt, Kayser, Hime, elementary solos; special sight reading duos by Mazas and Dancla. Other appropriate studies may be substituted for the above, if approved by the Director, as acceptable equivalents, the same to be satisfactorily performed before entering Course 12.

Students must appear in public recitals when required, playing from memory.

Required: Two lessons a week, harmony, music history, as in Course 6.

12. Studies by Kayser, Wohlfahrt, Schradieck, Mazas, Dont, and Kreutzer. Scales by Hrimaly and Schradieck or acceptable equivalents. Suitable solos, concertos, sonatas, etc. Students must appear in performance at public recitals when required by the Director, playing from memory.

Required: Two lessons a week; harmony and counterpoint.

Prerequisite: Course 11.

13. This course consists of advanced studies by Dancla, Fiorillo, Singer, Rhode, Gavinies, Paganini; solos by Dvorak, Brahms, Vieutemps, Rovelli, Spohr, De Beriot, Viotti, Wieniawski, or other acceptable equivalents. Students must appear in public recitals when requested, playing from memory.

Required: Two lessons a week, harmonic analysis, composition, German or French, as in Course 8. As a qualification for graduation students are required to perform publicly, under the direction of the School of Music, a program not less than an hour in length, arranged by the Instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 12.

The Orchestra. Students of stringed instruments in attendance at the College, who are sufficiently advanced, may be admitted to membership in the College Orchestra by arrangement with the Conductor on such terms as may be approved by the Director. It is the intention of the management to encourage in every reasonable manner the development and maintenance of a good orchestra under competent progressive leadership. Students are invited to investigate these opportunities for excellent training in orchestra routine and solo playing. Such experience and thorough drill are of great educational and cultural value. No student able to play fairly well should fail to avail himself of this training.

The Orchestra library consists of works by the following composers: Dvorak, Brahms, Tschaikowsky, Grieg, Gounod, Verdi, Mendelssohn, Beethoven, Elgar, Wagner, Offenbach, Strauss, and others.

Ensemble: Sonatas for violin and piano; string trios; quartettes for two violins, viola, and 'cello; and for four violins, will be studied. All students in the above classes, or registered in any of the above courses, must perform from memory in public when requested by the Director. Membership in the ensemble classes is free, and instruction is to be given by the principal violin instructor.

BAND INSTRUMENTS

Instruction will be given by the regular College band leader in the use of brass, wood-wind, and percussion instruments.

To become a member of the College Band, a student must pass a satisfactory examination in the elements of music and ability to perform on his instrument.

Members are required to attend rehearsals each school day, and a reasonable amount of individual practice is expected.

There is no charge for instruction in the band. Each member must furnish his own instrument and music stand, except basses, baritones, altos, and drums, which are furnished by the College.

Any student desiring to enter the band should see that his instrument is in low pitch.

The courses for the various band instruments are as follows:

14. **Cornet.** Methods by Arbou; characteristic studies by St. Jacome.

15. **Clarinet.** Methods by Dieppo; studies by Dieppo and Blume.

16. **French Horn.** Methods by Franz; studies by Franz and Hayffman.

17. In all other band instruments, including the oboe, bassoon, saxophone, alto, and bass clarinets, drummer's trapps, xylophone, and orchestra bells, the courses will be similar to those given above.

The work in theory required to complete these courses is that outlined for piano courses 6 and 7.

18. **Theory.** The course in theory will include systematic and progressive study of the elements of music; acoustics, notation, scales, keys, modes, sight reading, intervals, melodic progression, chords, rhythm, dynamics, and ear training.

Advanced theory will include harmony, counterpoint and subdivisions thereof, harmonic analysis, form, composition, and orchestration.

GENERAL INFORMATION

Any student in the Oregon Agricultural College with a satisfactory record in scholarship in his major course may take at least one hour a day in music.

The authority to register and assign all applicants for music instruction is vested solely in the Director, who must first be con-

sulted for the arrangement of necessary details of registration, or at any time when information is required that pertains to study in the various departments of the School of Music.

Students in the School of Music may enter classes in the several departments of the College; and in order to enhance their general culture are encouraged to take at least one study throughout the school year other than the work required in the regular music courses.

Applicants for instruction may take complete or partial courses. Those registering for the former are classified as "regular music," while the others are classified as "special music."

"Special Music" students have the option of selecting such music studies as they desire by registering for the same with the Director in the regular manner and at the catalogue rate of tuition.

Non-resident young women are required to live in the dormitories, where their conduct is subject to the approval of the Preceptress. Outside rooming and boarding places may be obtained, subject to the approval of the College authorities. The rates for board and room are listed elsewhere in detail.

Students registered for study in the regular courses of the Oregon Agricultural College School of Music are subject to the same rules and regulations as all regular students in other courses.

No student is permitted to omit lessons or practice without sufficient excuse, and no refund will be made for absence from lessons or practice or for discontinuance, except in cases of severe personal illness; for such unavoidable absence, lessons may be made up only by appointment, and before the expiration of the term.

Lessons falling on legal holidays, or on special holidays petitioned for by the student body or by special student organizations, which may be granted by the College authorities, will not be made up.

Students will not be permitted to transfer tuition accounts to others, nor to receive credit for tuition fees beyond the assigned registration period, except in cases of severe personal illness, attested by a physician, or similar extreme necessity, and then only by making suitable arrangements with the Director.

The College year in the School of Music consists of thirty-six weeks, divided into terms of about twelve weeks each, the first term beginning at the opening of the College on September 18, 1916.

Private individual instruction is given in lessons of thirty minutes each, in all departments of the School of Music. Class instruction in theoretical branches is required of candidates for graduation, as specified in the preceding outlines of courses. Terms for instruction are as follows:

Voice Culture and Singing—Professor Gaskins, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Organ—Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....	\$24.00
Two lessons a week, a term.....	48.00

Piano—Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Piano—May Babbitt-Ressler, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Piano—Instructor Corinne Blount, private instruction:

One lesson a week, a term.....	\$12.00
Two lessons a week, a term.....	24.00

Violin, Violoncello, Viola—Instructor Hellier-Collens, private instruction:

One half-hour lesson a week, a term.....	\$15.00
Two half-hour lessons a week, a term.....	30.00

Mandolin, Banjo, Guitar—Instructor ——— private instruction:

One half-hour lesson a week, a term.....	\$12.00
Two half-hour lessons a week, a term.....	24.00

Band Instruments—Instructor Beard, private instruction:

One lesson a week, a term.....	\$10.00
Two lessons a week, a term.....	20.00

Music History—Professor Gaskins, class instruction:

Two hours a week, one term.....	\$ 3.00
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Theory of Music—Professor Gaskins, class instruction:

Two hours a week, a term.....\$ 3.00

Harmony, Counterpoint, Harmonic Analysis—Instructor Blount;
class instruction, classes limited to six students:Each subject two hours a week; tuition for each sub-
ject, a term\$ 7.50**Composition (including Form), Orchestration**—Instructor Blount,
class instruction, classes limited to six students:

Two hours a week; each subject, a term.....\$ 7.50

PRACTICE

Rooms located in one of the College buildings have been suitably furnished for the use of students wishing to practice in private. These rooms may be rented for about one-third the cost of using pianos located in private houses, and without any of the disadvantages in connection therewith. These practice rooms, with steam heat, good ventilation, electric illumination for night practice, and good janitor service, are furnished with good pianos, kept in tune by the College. Students living in the College dormitories are required to practice upon these pianos. Students living away from the campus may arrange with the Director for practice on the same terms and conditions, as follows:

Piano—

Term of twelve weeks, one hour a day.....\$ 5.00

Two hours 7.50

Three hours 10.00

Four hours 12.50

Five hours 15.00

Organ—

Term of twelve weeks, one hour a day.....\$12.00

Two hours 18.00

The pipe organ is a new, modern Kimball two manual, concave pedal board instrument of beautiful tone.

For additional information address William Frederic Gaskins, Director, Room 30, Administration Building, Oregon Agricultural College, Corvallis, Oregon.

THE EXPERIMENT STATION

ARTHUR BURTON CORDLEY, Director
CLAUDE ISAAC LEWIS, Vice Director

The Agricultural Experiment Station bears an important relation to the College, as the scientific investigations conducted by the staff strongly support the instruction given in the class room and through the extension service. Aside from the original investigations of economic significance to agriculture, the work of the Station affords daily object lessons in modern farm methods.

About 650 acres of land are available for the use of the College and Station workers. This land is utilized by the various departments represented in Station organization, including the departments of Chemistry, Drainage and Irrigation, Farm Crops, Farm Mechanics, Silos and Farm Management, Horticulture, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Entomology, Bacteriology, Pharmacy, and Botany and Plant Pathology. Each department is actively engaged in the scientific investigation of problems presented by the different branches of agriculture.

In addition to the experimental work carried on by the departments of the School of Agriculture, experimental work is also conducted by the School of Engineering, the School of Home Economics, and the department of Pharmacy.

The value of such work, as an object lesson to the students in the various fields of study, can hardly be overestimated. Its value to the State, from the point of view of economic progress, has been greater, in the estimation of many careful observers, than the entire cost of the College to the people.

As an illustration of the comprehensive character of the investigational work carried on by the Station, the following brief summaries of projects, by departments, is presented:

Agricultural Chemistry. This department, either independently or in cooperation with other departments of the College, has under way a considerable number of experiments that are of wide significance both to the economic interests of the State and Nation and to the cause of science. Experiments with arsenical sprays, that represent a total annual expenditure throughout the country of six to eight million dollars, are directed to the object, first, of determining exactly how the efficiency of these arsenicals is best conserved, and second, how a less expensive form of a similar insecticide may be developed. The first object has been partly

accomplished, with promise of conclusive results, and the second, through the use of arsenate calcium, seems also within reach of fulfillment. Soil investigations conducted in cooperation with the department of Bacteriology are directed to the determination of how nitrogenous organic matter in the soil is made available, through ammonification and nitrification, for plant food, and how nitrogenous substances, present in the soil in forms unavailable for plant food, may be broken down and rendered soluble and available for use of growing plants. In cooperation with the Southern Oregon Branch Experiment Station, at Talent, the department has made a complete chemical survey of the soils of the Rogue River Valley, with a view to determining the deficiencies to be supplied by fertilizers. Sulfur is found to be the element, which, when added to certain of these soils, increases the production of alfalfa and other legumes by percentages running into the hundreds. These fertilizer experiments promise some very striking and valuable results. Incubation experiments, now reaching completion after several years of laborious and painstaking study, go to show that varying the conditions of incubation varies also the quality of the chicks produced. Limited experiments with loganberry juice have been conducted to determine what jelly-making acids are present in the juice, what modifications appear in the juice of the second pressing, and what use may be made of the pulp. Soil analyses conducted in connection with the reclamation service have comprehended one-half million acres of land. Routine analyses of commercial fertilizers, especially of limestone, have shown the need of caution in the use of these fertilizers at current prices unless the quality is high. Analyses of all insecticides on the market are on file at the Chemist's office, where information concerning any of them may be had, free of charge, on application.

Animal Husbandry. Experiments in Animal Husbandry, which comprehend tests with horses, beef cattle, sheep, and swine, are conducted partly at the Corvallis Station and partly at the Eastern Oregon Branch Station. Experiments with horses are directed to determine the cost of horse power for various types of farm and other work; the amount of work that may reasonably be expected from a horse; the cost of keep, etc. Experiments with beef cattle, conducted chiefly at Union, have shown striking results in the use of grain with alfalfa hay and pasture. Experiments with sheep, chiefly at the home Station, have been directed to determine the cost of production, the carrying capacity of different types of pas-

ture, methods of fattening sheep, and methods of rearing and marketing lambs for meat purposes. Experiments with hogs involve the cost of production, including rapidity of gain; and comparison of different feeding rations and methods of feeding, including use of pasture.

Bacteriology. Experimental work in Bacteriology is chiefly concerned with soil analyses, with dairy manufacturing, sanitation, and diseases of poultry. Three experimental projects of economic importance that are now under way are the following: (1) The effect of lime and landplaster on the growth of soil bacteria and therefore on the crop; (2) The effect of dryness and varying degrees of soil acidity on the growth of legume bacteria; (3) The facts concerning the prevalence, transmission, and means of control of chicken diseases such as tuberculosis and white diarrhoea.

Botany and Plant Pathology. Experimental work in this department is devoted chiefly to six projects; namely, (1) The life-history and control of brown-rot diseases of fruits and twigs; (2) Bacterial gummosis of cherries and other stone fruits; methods of communication and control; (3) Diseases of potatoes; (4) Wilt diseases of clovers and alfalfa; (5) Bacterial blight of filberts; (6) Spraying for orchard diseases. The gummosis investigations, which have now been under way for several years, have yielded striking results, and promise to lead to effective methods of controlling this most devastating disease of the chief varieties of commercial cherries in Oregon.

Dairy Husbandry. Experiments in this department are directed to standardizing the color of butter and to determining the amount of coloring matter to be added to cream of a certain test, by sample, in order to bring it to standard color, or "June shade;" to determine whether or not to use "starter" in churning butter; to determine the keeping quality of butter made from cream of different degrees of acidity, neutralized, pasteurized, and churned; to determine, by testing the different factors in the handling of milk, what are the essentials in reducing the bacterial count of milk for market; to determine the function of the so-called milk veins and their bearing on milk production; to determine the factors influencing the percentage of butter fat content in milk; to determine the feeding value of alfalfa meal as a substitute for the usual grain feeds; to determine the value of kale as compared with silage as a succulent feed.

Drainage and Irrigation. Five specific projects of considerable breadth and importance are under investigation by this department. Following is a brief outline of the projects and their aim. (1) Irrigation and Soil Moisture Investigations in Western Oregon. These are four-years' rotations to measure the value of irrigation, rotation, and manure in increasing crop yields and lessening water requirement. In connection with these investigations three-years' rotations on white lands are being conducted cooperatively to determine the effect of this rotation treatment on bacterial activity and chemical composition of the soil. (2) Duty of Water Investigations. This work is conducted cooperatively with the U. S. Office of Irrigation Investigations. It is State-wide in scope, with agencies at Paisley and Burns in Eastern Oregon. The aim is to determine the right amount of water for the chief soil types and leading crops under the main types of farming in the principal irrigated valleys of the State. (3) Drainage Experiments. This work, which is conducted on a nine-acre tiled tract of the College farm, is directed to determining the efficiency of drains spaced at intervals of 25 to 100 feet. The ten-years' trials indicate that on this type of clay soil 50 feet is the most efficient distance for spacing drains. (4) Experiments in Drainage to determine the most efficient depth for placing drains in soils of different types, and for testing the efficiency of bedding drains in straw and gravel. Since there are one-half million acres of marsh land in the State and three million acres of land periodically wet, the value of these investigations is obvious. If efficient drainage added to the value of the land the average determined for this work in the Middle West, the reclamation of the State's wet soils would add at least \$10 an acre to the value of these millions of acres.

Entomology. Experiments in Entomology include tests to determine the toxicity of various insecticides with three objects in view: (1) To discover new and cheaper insecticides; (2) To discover possible combinations of sprays that will reduce the number of necessary applications; (3) To determine the actual amount of poison necessary to kill a given insect. Experiments also include tests to determine possible means of control for root borers and other root-infesting insects that carry plant diseases; a systematic and economic study of insects attacking Douglas fir; and a study of the economic slugs of the Pacific Northwest.

Farm Crops. This department has in hand four specific experimental projects of chief importance; namely, (1) Variety tests

of wheat, oats, barley, flax, vetch, potatoes, and corn; (2) Cultural tests on miscellaneous crops such as sudan grass, sunflowers, mustard, soy beans, and cow peas; (3) Seeding experiments on the time, rate, and date of seeding cereals and legumes; (4) Selection and breeding work with cereals and legumes.

Horticulture. Experiments in Horticulture comprise the following types of investigations: (1) The pollination of the Pomaceous Fruits, including the Gross Morphology of the Apple, Fruit Bud Development of the Apple; Variation of the Internal Structure of Apple Varieties, etc. (2) Irrigation work with apples and pears, (2) Experiments with stocks of both apples and pears, (4) Problems of both winter and summer pruning, (5) A study of critical temperatures, (6) Strawberry variety tests, (7) Cover-crop investigations, (8) Fertilizer investigations, (9) Breeding investigations with cherries, apples, prunes, and strawberries, (10) Investigations in orchard economics, (11) Vegetable gardening investigations with greenhouse tomatoes, onions, and type selection for canning, (12) Investigations with by-products of loganberries and other fruits; (13) Investigations in the relation of depth of planting to mortality of trees.

Poultry Husbandry. Experiments in poultry husbandry are chiefly concerned with problems of incubation and with breeding fowls for high average egg production, and for a combination of egg production and meat value. Results in both fields of experimentation have already been remarkable and promise still greater progress toward the objects desired. A new breed, the Oregon, seems to be established with the attributes sought.

Soils and Farm Management. This department is concerned with the following different lines of investigation: (1) Soil Fertility Investigations, including, (a) Fertilizer trials on Willamette Valley clay loam; on Willamette Valley white lands; on Willamette Valley fine sandy loam; (b) Cooperative trials on Willamette Valley clay loam; on Eastern Oregon silt loam; on Central Oregon sandy loam; (c) Cooperative fertilizer trials in Marion, Yamhill, Benton, Coos, and Josephine counties; (2) Agricultural lime investigations, (3) Dry-farming tillage investigations, (4) Soil moisture investigations, (5) Pumice soil investigations, (6) Adobe soil investigations, (7) Soil surveys of irrigation projects, (8) Farm Management surveys, (9) Cost of Production Investigations.

Veterinary Medicine. The experimental work of this department has been devoted chiefly to finding means for prevention of sterility in cattle.

EXTENSION SERVICE

RALPH DORN HETZEL, Director

The Extension Service of the Oregon Agricultural College represents one of the three main divisions of the college activities; namely, college instruction, experiment station, and college extension. It includes in its present form the following distinct lines of work: (1) Publication of bulletins. (2) Correspondence courses. (3) Farmers courses and meetings. (4) All exhibits made at fairs and upon special occasions. (5) Class work and lectures at local chautauquas. (6) Movable Schools of from three to six days duration. (7) Individual advisory work with the farmers of the State. (8) Officiating and judging at fairs. (9) Conducting Farmers' and Home Makers' Weeks of from one to two weeks' duration—one at the College, one in Eastern Oregon, and one in Southern Oregon. (10) The supervision and direction of the boys' and girls' industrial club work in cooperation with the Superintendent of Public Instruction. (11) Special field dairy work and assistance in dairy organizations. (12) The supervision and direction of county agent work. (13) Farm management demonstrations. (14) Assisting in rural organization and in the marketing of farm products.

Extension Subjects. Extension teaching is concerned with all instruction given by the College which is not classified as a part of the regular resident work. The subjects which are included in the extension work are, therefore, all the subjects taught at the College which are of such a nature as to lend themselves to extension methods. While the College, in the past, has been exclusively concerned with agricultural and home economics extension, it has now provided for extension work in all lines of instructional effort.

In addition to the instruction offered in the various branches of agriculture, home economics, commerce, and engineering which is specifically outlined in the pages following, extension instruction is also being given in forestry, mining engineering, mechanical engineering, electrical engineering, commerce, highway engineering, education and other scientific and industrial subjects. While it is clearly impossible to attempt to give complete and full courses in the great majority of these lines of work, there is much that is prac-

tical, usable, and valuable that can be taught through extension methods. It is, then, only such branches of the College work as can be effectively taught without residence requirement, that will come within the scope of extension work.

Extent of the Work. During the past two years college representatives have held meetings in 230 towns and rural districts of the State with a total recorded attendance of 140,543 people. Many more than this number were reached by means of educational exhibits, chautauqua lectures, and demonstrations for which no record of attendance was made. During this period 72 extension bulletins were published with a total of 341,900 copies. Of all these activities by far the greater number have been carried out during the past year. The staff of the Extension Service now consists of 33 people, including the county agents. In the work of the Service, the U. S. Department of Agriculture is cooperating by lending support to many of the activities in operation, both by providing funds and by delegating trained officers for the field service.

Importance of Extension Work in Oregon. The magnitude of the problem of College extension in Oregon can be fully realized only by keeping in mind that the State has a population of nearly 800,000 distributed over a total area of 95,600 square miles—a territory greater than the combined areas of Illinois and Indiana and almost as great as the combined areas of New York, New Jersey, and Pennsylvania. The State, moreover, has few railroads, and in certain sections is very sparsely settled. The people who are to be reached by extension methods represent the greatest extremes in age, capacity, education, and experience with the climate and the country. Oregon's great diversity in elevation, precipitation, temperature, soil, and climatic conditions, still further complicates the problem of extension service, and makes it important in proportion to its complexity.

How to Apply. All persons or communities in the State wishing assistance in any of the lines indicated, should communicate with the Extension Service as far as possible in advance of the time the appointment is desired. Short-notice requests may not find the department in position to render the best service. If a Movable School is desired, be sure to give all particulars pertaining to the time, the nature of the subjects in which the community will be interested, the number of speakers desired, and the plans

for the meeting. If a single lecture or demonstration or exhibit is wanted, be equally prompt and explicit.

It must be remembered that while the College is willing at all times to help all who apply, its staff, facilities, and funds are limited. On this account, the Extension Service is sometimes unable to give aid where it would like most to give it. Requests for instruction or other assistance, however, should not be withheld; since the great majority of the State's needs have been, and generally can be, cheerfully and efficiently met.

Any county desiring to organize under the provisions of the law for agricultural field and demonstration work and the support of a county agriculturist should communicate with R. D. Hetzel, Director of Extension Service at the Agricultural College, in order to determine the best methods of procedure.

ADMINISTRATIVE

RALPH DORN HETZEL, Director
HAZZLITT VICKERS, Secretary

The administrative work of the Extension Service is vested in a director, secretary, and heads of the various departments. The administrative duties consist of planning and coordinating the several lines of Extension work, dividing and assigning funds, planning the Extension campaigns, meetings, schools, conferences, demonstrations, etc., authorizing all Extension publications, planning and arranging exhibits, and supervising the prosecution of all phases of the work. Reports are required covering all lines of Extension service and periodical reports are made to College officials and other cooperating agencies.

AGRONOMY

JOHN ELMER LARSON, Extension Specialist in Agronomy.

Extension Agronomy embraces several distinct lines of work: soils, crops, drainage, irrigation, farm management, and farm mechanics.

The lecture work covers the composition and physical properties of soils, soil fertility, and farm manures. Drainage includes the soil management subsequent to installing drains as well as the drainage construction work. Irrigation includes the economic use of water, removal of alkali by drainage, etc. The crop work

covers crop rotation, cultural methods, housing and storing, farm management, or the business side of farming. Farm mechanics comprehends farm structures, wood and concrete, and care of farm machinery.

The demonstrations include classifications and properties of soils, judging of corn and potatoes and their selection for seed, germination of seeds, operation of farm machinery, and applied principles of drainage.

ANIMAL HUSBANDRY

RALPH ELMER REYNOLDS,
Extension Specialist in Animal Husbandry

Extension Animal Husbandry takes up the different breeds of live stock, the principles of breeding, different feeds and methods of feeding, and the general care and management of beef cattle, horses, swine, sheep, and goats. With beef cattle, special stress is laid upon the use of better sires and better care to obtain best results. Emphasis has been laid upon the unsoundnesses of horses, and the need for the exercise of great care in the selection of sound, pure-bred sires. The results of a large number of pig-feeding experiments at our Experiment Station, showing the most profitable feeds and methods of feeding, have been given the farmer. Better care and management of sheep, the use of better sires, together with improved methods of handling the wool clip, have been urged upon the sheep men. The general aim is to assist the stock raisers in producing better animals at less cost.

BOYS' AND GIRLS' CLUB WORK

HARRY CASE SEYMOUR, State Leader
HELEN JULIA COWGILL, Assistant State Leader
LEONARD JOHN ALLEN, Assistant State Leader, Pig Club Work

The Junior Extension activities of the Oregon Agricultural College take the form of club and contest work among the boys and girls. Those who are, or can be, interested in the basic farm and home enterprises, such as the growing of plants, the rearing of animals, or the work in home economics, are encouraged to enroll for one or more club projects.

The club project, which is to be worked out at home, may take the form of growing 1-16 acre or more of corn, potatoes, vegetables, etc., the management of a brood sow and litter, or a single

pig; raising a flock of chickens; keeping a milk and feed record on a herd of dairy cows; the completion of ten lessons in sewing, baking, or canning—14 different projects in all.

Assistance is rendered, enthusiasm aroused, and interest sustained in the work by means of Club meetings, circulars and bulletins, and personal visitation by local, county, and State Club leaders.

Prizes are offered to the winners in Club projects at the local, county, and State Club festivals and fairs. The Club members are made to see, however, that the most worth while prizes are the knowledge, skill, and profit that each may derive from the work.

Club work in Oregon is maintained and supervised by the Oregon Agricultural College Extension Service in cooperation with the U. S. Department of Agriculture, and the State Department of Education. The activities of all these agencies are focalized in a State Leader of Club work, who is a member of the Extension Service staff, and to whom all inquiries regarding Club work should be addressed.

COOPERATIVE FARM DEMONSTRATION WORK

PAUL VESTAL MARIS, State Leader
MERRILL OSGOOD EVANS, Assistant State Leader

The largest department in the Extension Service at the present time is the Farm Demonstration Department which includes the county agent work. In charge of this department is a State Leader and an Assistant State Leader. Prosecuting the work throughout the State are the various county agents. At the present time there are fifteen of these men in the Service, located in the counties which have made an initial appropriation for the work. They are charged with the development of the agricultural interests of their respective counties.

For the most effective accomplishment of this purpose the following plan of work has been adopted in Oregon:

Whenever possible the county agent allies himself with and works through existing farmers' organizations which have for their aim the betterment of agricultural conditions. He seeks to have formed a county-wide agricultural council made up of one member of the County Court and one representative from each of these existing organizations. Unorganized communities upon

perfecting an organization may elect a member to the aforesaid council. The county agent, acting with this agricultural council or body of leading farmers, representing the various agricultural interests of the county, decides upon a program of work for the year. This program may include the formation of marketing organizations, such as poultry and egg circles, cattle shippers' associations, potato growers' associations, etc., the organization of drainage districts, conducting practical farm demonstrations pertaining to the management of soils, crops, live stock and orchards, or the control of insect pests and contagious animal diseases.

The county agent, in short, establishes a center of local agricultural interests. He maintains a central office in which is assembled information pertaining to the agriculture of his community. He is the representative of the United States Department of Agriculture, the State Agricultural College, and the county in which he is located, and through the union of these forces he is able to apply the fullest measure of practical and scientific knowledge to the solution of problems and the improvement of country life conditions.

While the county agent renders valuable service to individual farmers, he is obliged to work largely through groups. His greatest service is rendered in dealing with the larger problems of a community, in organizing and directing the farmers in movements for self help, in securing for the county the services of specialists when specialists are needed.

How to Secure a County Agent

Under Section 3 of Chapter 110 of the session laws of 1913 provision is made whereby county courts in counties with areas of less than 5,000 square miles, may appropriate a sum up to \$2000 for the employment of a county agent and maintenance of his office. Larger counties may appropriate up to twice that amount. It is further provided that there shall be available from state funds an amount equal to that appropriated by the county for the support of the work. The government also gives actual financial assistance by contributing to the salaries of administrative officers, granting the franking privilege to the county agents, providing certain supplies, etc. The government, state and county therefore jointly finance the work.

The law of Oregon specifies that the funds for county agent work shall be expended under the direct supervision of the Oregon Agricultural College. The responsibility for the success of the work in each county, therefore, rests largely with this institution.

In order that a county may avail itself of the services of a county agent it is only necessary, from the legal standpoint, that the county court make the necessary appropriation and request the Agricultural College to install and supervise the work. Experience has shown, however, that unless a considerable number of the farmers of the county understand the work and desire it, it is not advisable to introduce it. When the plan of the work and its value to a county are understood, the general experience in Oregon and the country at large is that farmers strongly favor it. In view of these facts, the following plan has been adopted for the introduction of work in counties in Oregon that do not have county agents:

Upon the receipt of a request from a sufficient number of individuals or organizations within a county to indicate an interest, the College, through the Extension Service, will cooperate with these individuals or organizations in carrying on a county-wide campaign of education regarding county-agent work. The local people of the county will be expected to arrange for a series of meetings at which the farmers of the community will be brought together. The College will provide a speaker for these meetings who will, at the same time, prepare explanatory articles for the newspapers of the county. If, after the work has been thoroughly explained in this manner, twenty-five per cent or more of the farmers of the county will request the work by petition and agree to aid in organization of an agricultural council to cooperate with the county agent, and provided further that the county court will make the appropriation, the College will then introduce and supervise county agent work in the county.

DAIRYING

EDWARD BLODGETT FITTS, Extension Specialist in Dairy Husbandry
WILLIS ARCHER BARR, Dairy Husbandman
FRANK WALTER KEHRLI, Dairy Husbandman

Extension Dairying carries throughout the State, and helps to put into effective use, information regarding all branches of the dairy industry, such as care and management of the herd, the rais-

ing of the calf, the construction of buildings, the breeding and feeding of cattle, the treatment of diseases, the care of milk and cream, and the manufacture of dairy products. Special emphasis and aid is given toward effecting dairy cooperative organizations, such as Cow Testing Associations, Breeders' Associations, Bull Associations, Farmers' Cooperative Creameries, Farmers' Cooperative Cheese Factories, and Farmers' Cooperative Cream Selling Agencies.

FARM MANAGEMENT DEMONSTRATIONS

HAROLD KEYES, Farm Management Demonstrator.

The purpose of the department of Farm Management Demonstration is to demonstrate to farmers, in connection with their own farms, a practical and efficient method of summarizing and analyzing a farm business as a means of measuring the profit or loss incurred in conducting it and of deciding upon readjustments that promise to increase its net income.

In a farm management demonstration the business of each farm in a community is analyzed from an economic standpoint and then compared with the others to determine some of the changes which should be made in its organization to make it more profitable.

HIGHWAY ENGINEERING

GORDON VERNON SKELTON, Extension Specialist in Highway Engineering

Extension Highway Engineering offers its assistance to the county courts, road officials, and citizens of the State generally in attaining a higher standard in road construction and maintenance.

Lectures and demonstrations are given before meetings of county road officials and citizens' organizations on construction and maintenance of all the ordinary types of roads in common use, including consideration of drainage, alignment, and approved methods of construction.

Personal examinations, laboratory tests, and reports on road building material are also features of the work done.

HOME ECONOMICS

ANNA MAE TURLEY, Extension Specialist in Home Economics

Home Economics Extension offers a means by which the home-makers of the State may call upon the College for assistance in solving their special problems. This work is planned, first, to meet the demand of Oregon women who are interested in all subjects related to the home and better living conditions; and second, to create a greater interest in these subjects concerning the vital problems, three of which are:

1. The food—selection, preparation, and use.
2. The house—its arrangement, decoration, and conveniences.
3. The clothing—methods of removing stains, simple tests for wool, cotton, linen, and silks, selection, preparation, and use.

HORTICULTURE

WALTER SHELDON BROWN, Extension Specialist in Horticulture

Extension Horticulture covers the whole subject of orchard operations including cultivation, pruning, spraying, thinning, harvesting and marketing, laying especial emphasis upon the vital question of reducing the cost of producing and handling fruits.

Small fruits and vegetables will have their share of attention and the improvement of the surroundings of our farm homes will be emphasized as a matter of great importance.

Improvement in the quality of the exhibits of county and community fairs, better arrangements of such exhibits, and a clearer and more uniform method of classification of exhibits is a subject that will be given considerable attention.

Special emphasis will be laid upon two series of projects or farm schools—one for pruning and one for spraying. This work contemplates having the operations of pruning and spraying, under field conditions, performed by members of the classes enrolled under the direction of the Extension Horticulturist.

ORGANIZATION AND MARKETING

HECTOR MACPHERSON, Extension Specialist in Organization and Marketing.

GUILFORD LANSING HURD, Field Organizer

The Extension Service Bureau of Organization and Marketing takes up the investigation and marketing problems which are

confronting the farmers of the State. One man is in the field constantly, working with the farmers who are attempting, through organization, to better their conditions. Other members of the staff are sent out on definite organization projects, such as creamery and cheese factory organization, and the establishment of egg circles for the marketing of poultry products. It is the aim of this department to help farmers organizations to get started in such a way as to accomplish the most good with the least possible risk and outlay.

Systematic instruction is being carried on through extension lectures and press bulletins, covering the whole field of marketing and rural credits.

POULTRY HUSBANDRY

CHARLES CHAUNCEY LAMB, Extension Specialist in Poultry Husbandry

Extension Poultry Husbandry involves all phases of the poultry industry as they should be applied on the farm.

The subjects, which are handled in the most practical way possible, are as follows: Breeds and Breeding; Feeding and Management of Growing Stock; Laying Hens and Market Fowls; Natural and Artificial Incubation and Brooding; and Care and Marketing of Poultry and Eggs.

PRESS SERVICE

CHARLES JARVIS McINTOSH, Editor Press Bulletin

The Extension press service assists in getting the valuable information developed by the research specialist out to the farms, factories, offices, homes, and schools where it is most needed. A printed bulletin containing more than a dozen brief news stories of seasonal information in popular language is sent each week to all newspapers and other periodicals of Oregon, and to a selected list of about four hundred publications in the Northwest and in other parts of North America. These stories remind farmers and other operators of the need of certain practice, and instruct them in the best methods of applying it. The department sends stenciled stories to all the dailies of the State once a week, a College News letter weekly to many of the leading metropolitan dailies of the United States, many specials to the newspapers in Portland as

well as other places in the State, and comprehensive articles of technical nature to hundreds of class publications. The department also supervises student special correspondence. Special announcements of field work are furnished newspapers of the communities visited by field specialists.

CORRESPONDENCE COURSES

The aim of the Extension Service of the Oregon Agricultural College in offering correspondence courses is to reach those who cannot be reached otherwise, but who are seeking special information along some line of work which can be taught through correspondence. Courses are offered only in such subjects as will prove of practical benefit to those who are working, or who are interested, in the special lines of work taken up.

It is assumed in most of the courses offered that the student has only a general acquaintance with the subject taken up and that he desires a practical working knowledge of it. Subjects, therefore, will be presented in simple and direct language.

The following courses are offered:

1. Farm Accounting
2. Rural Law
3. Rural Economics
4. Advertising and Selling
5. Cooperative Accounting and Management
6. Business Organization and Management
7. Business Management for Women
8. Business Law
9. Bookkeeping
10. Accounting
11. Farm Arithmetic
12. Gas Engines
13. Concrete Construction on the Farm
14. Shop Arithmetic
15. Shop Drawing
16. Electricity and Magnetism
17. Heat and Its Mechanical Transformation
18. Farm Irrigation Practices
19. Farm Drainage

Additional courses in other subjects will be added from time to time as demands are made for them.

General Information

Students may begin correspondence courses at any time during the year.

No preliminary examination is required for enrollment.

Students desiring to enroll in any courses offered, should fill out the attached application blank and return to the Extension Service, Oregon Agricultural College, Corvallis, Oregon, with remittance required for the course.

Upon receipt of the enrollment blank and the remittance, enough assignments will be sent to the student to enable him to begin his work and continue it without interruption. Whenever a recitation is submitted by the student, one or more assignments will be sent to him. In this way the student always has on hand sufficient material for study.

Accompanying each assignment is a set of recitation questions or exercises. After completing the study of an assignment the student is required to answer the recitation questions or to work out the exercises and send them to the instructor in charge of his work. The recitation or exercise will be carefully examined by his instructor; errors corrected; necessary explanation made; all questions answered; the paper graded and returned to the student.

Remittance for fees, text books, and notes should be made payable to Business Office, Oregon Agricultural College, and inclosed with application for the course.

The charges for the various courses are to defray, in part, the expense of providing texts, mimeographed notes, plates, postage or other material furnished, and in some cases the expense of an instructor where it is necessary for the instructor to meet with the class.

For specific information regarding correspondence courses write to the Extension Service for special circular.

ROSTER OF OFFICERS

and Non-Commissioned Officers, Military Department, O. A. C., 1915-16.

COMMANDANT OF CADETS

MAJOR U. G. McALEXANDER, Infantry, U. S. Army
Professor of Military Science and Tactics

ASSISTANT COMMANDANTS

Post Commissary Sergeant C. F. DUGGER, U. S. Army, Retired.
Regimental Sergeant Major DENIS HAYES, U. S. Army, Retired.

CADET OFFICERS, FIRST REGIMENT

Field and Staff

MARCUS F. HATHAWAY, Colonel.
FRANCES D. YEAGER, Lieutenant-Colonel.
KENNETH L. FOX, Captain and Adjutant.
MARTIN A. SCHREIBER, Captain and Quartermaster.
WALTER J. KOENIG, Captain and Commissary.

FIRST BATTALION

Field and Staff

Sereno E. Brett, Major
D. W. Minsinger, Lieut. & Adj.

Captains

Dale E. Richards "A"
Mahlon B. Gilbert "B"
John W. Green "C"
Edward C. Allworth "D"

Lieutenants

Paul H. Crouter "A"
Rodney Pearson "B"
Ira Mix "B"
R. B. McMinn "C"
F. C. Shepard "D"
L. Overholser "D"

SECOND BATTALION

Field and Staff

Leo L. Laythe, Major
Ivan H. Loughary, Lt. & Adj.
Jesse O. Turner, Lt. & Qr. Mr.

Captains

Thomas Lamoreaux "E"
Homer F. Aker "F"
Miles S. Johns "G"
Arnold J. Funk "H"

Lieutenants

Charles H. Roseman "E"
Richard J. Case "E"
John M. Hamilton "F"
E. J. Thompson "F"
Ralph P. Laird "G"
Will Boyer "H"
Armond Taylor "H"

THIRD BATTALION**SECOND REGIMENT****Field and Staff**

A. A. Amort, Major
 S. N. Mayhew, Lieut. & Adjt.
 F. F. Kan, Lieut. & Qr. Mr.

Field and Staff

G. R. Hoerner, Lt. Col.
 T. H. Soo, Lieut. & Adjt.

Captains

W. H. Gerke "I"
 R. W. Burns "K"
 E. H. Thompson "L"
 B. B. Buchanan "M"

Captains

C. M. Hubbard "A"
 G. E. Chambers "B"
 R. L. West "C"
 G. L. Kathan "D"

Lieutenants

A. L. Lindsay "I"
 C. G. Walker "K"
 H. A. Ballin "K"
 R. L. Tweed "L"
 L. E. Baldwin "M"
 L. W. Seggel "M"

Lieutenants

P. W. Harvey "A"
 A. W. Finch "A"
 A. L. Lasswell "B"
 B. Black "B"
 H. B. Abraham "C"
 N. E. Manock "C"
 C. L. Strome "D"

CADET NON-COMMISSIONED STAFF

D. P. Spalding, Regimental Sergeant Major
 J. H. Whitby, Regimental Quarter Master Sergeant
 F. W. Walton, Regimental Comsy. Sergeant
 L. D. Yates, Color Sergeant
 P. B. Hofer, Color Sergeant
 P. A. Currey, Sergeant, 1st Class, H. C.
 A. C. Lascar, Ordnance Sergeant
 E. H. Boone, Sergeant Major, 1st Battalion
 P. H. Sessions, Sergeant Major, 2d Battalion
 C. H. Waterfall, Sergeant Major, 3d Battalion
 F. T. Murphy, Sergeant Major, 2d Regiment
 J. Hayes, Chief Trumpeter

NON-COMMISSIONED OFFICERS**Band, 1st Regiment**

J. Nash, Chief Musician
 F. A. Holmes, Prin. Musician
 S. W. Tulley, Drum Major

Company "A"

Sergeants

R. Aker
R. Kenton
W. Luxton
H. Von Lehe

Corporals

D. S. Felton
W. H. H. Keen
P. W. Martin
H. C. Richter
D. W. Richter
O. H. Schrepel
L. M. Stark
G. S. Vincent

Company "L"

Sergeants

R. J. Werner (1st)
H. V. Levage
C. J. Pimm
H. M. Reynolds

Corporals

W. M. Bellinger
V. Firestone
E. F. McCornack
J. B. Wilson

Company "M"

Sergeants

O. A. Mulkey (1st)
D. E. Bullis
C. W. Meyers
R. L. Morgan
L. K. Jones

Corporals

D. I. Bates
B. E. Lee
E. D. Porter
L. D. Rice
W. Wilkins

Sergeants

A. D. Hurley (1st)
R. G. Otis
E. W. Bartruff
M. Harris

Corporals

W. F. Miller
G. L. Mickel
J. Wilson
M. Van Buskirk
W. S. Carpenter
E. E. Garbutt

Company "A" 2d Rt. Company "C" 2d Rt.

Sergeants

C. L. Stidd (1st)
H. Blackwell
C. C. Green
H. W. Kruger
A. G. Sieberts

Corporals

F. H. Crane
G. B. Somers
J. M. Underwood
W. H. Gordon
A. Woodcock

Company "B" 2d Rt. Company "D" 2d Rt.

Sergeants

W. Riippa (1st)
R. M. Wilcox
W. S. Averill
D. V. Green
C. S. Sodhi

Corporals

R. O. Coleman
K. C. Conyers
J. R. Brooke
L. F. VanNorden

Sergeants

R. A. Parrish (1st)
R. L. Houck
J. E. Dickerson
J. L. Turnbull
H. A. Long

Corporals

E. Englund
V. I. Basler
T. P. Cramer
F. Mudge

Sergeants

W. L. Kadderly (1st)
P. E. Doty
C. A. Fertig
H. H. Hilton
R. C. Babbitt

Corporals

G. H. Letelier
T. J. Lowe
J. D. McKay
K. Rowntree

Company "B"**Sergeants**

W. H. Ball (1st)
 F. W. Hoover
 C. G. Tanner
 J. A. Crawford
 E. E. Grubbe

Corporals

L. W. Coleman
 G. W. Carpenter
 J. O. Bettis
 H. W. Thayer
 A. V. Vierhus

Company "C"**Sergeants**

C. L. Meyers (1st)
 D. C. Mosby
 N. S. Lance
 J. A. Hooper
 L. L. Branthoover

Corporals

O. H. Hampton
 E. G. Brown
 L. N. Lindeman
 L. P. Mitchell
 L. K. Couch

Company "D"**Sergeants**

A. G. Skelton (1st)
 H. C. Patton
 D. Friedman
 I. J. Wolf
 H. F. Thomas

Corporals

A. H. Amis
 A. O. Meier
 H. P. Ebinger
 G. Corey
 R. Bissell

Company "E"**Sergeants**

E. H. Miller (1st)
 W. Anderson
 A. Ferguson
 E. M. Rand
 C. W. Werth

Corporals

D. M. Burleigh
 F. S. Cramer
 F. P. Meyers
 R. Paroni
 A. R. Philippi

Company "F"**Sergeants**

N. C. Carnie (1st)
 H. Selby
 F. S. Metzger
 E. Dunn
 C. Wilkes

Corporals

G. L. Jessup
 A. O. Leech
 J. R. Croswhite
 F. M. Curry
 G. S. Strome

Company "G"**Sergeants**

W. B. Arens (1st)
 J. H. Edwards
 C. S. Johnson
 C. S. Johnson
 W. B. Tilley

Corporals

E. T. Gammon
 L. Happold
 B. T. McMinn
 S. H. Myers
 J. E. Thrailkill

Company "H"**Sergeants**

L. A. Lamoreaux
 (1st)
 G. Gragg
 R. Throne
 H. W. Turner
 J. E. Simpson

Corporals

D. S. Frame
 H. C. Rogers
 C. C. Larson
 F. A. Hayes
 P. T. Fortner

Company "I"**Sergeants**

W. A. Bailey (1st)
 W. Andrews
 F. P. Cronemiller
 G. W. Vilas
 B. F. Rush

Corporals

N. W. Reese
 S. W. Caldwell
 C. Atwood
 R. J. King
 L. R. Guthrie

Company "K"**Sergeants**

F. B. Brown (1st)
 J. C. Boone
 A. L. Lowell
 L. B. Moore
 L. M. Johnson

Corporals

A. T. Anderson
 J. C. Chapman
 L. T. Chellis
 E. Hatton
 A. W. Oliver

CATALOGUE OF STUDENTS

(The following abbreviations are used to indicate the course in which the student is registered and the classification within the course: Agri., Agriculture; C. E., Civil Engineering; Com., Commerce; H. E., Home Economics; E. E., Electrical Engineering; For., Forestry; L. E., Logging Engineering; Hi. E., Highway Engineering; I. E., Irrigation Engineering; I. A., Industrial Arts; M. A., Mechanic Arts; M. E., Mechanical Engineering; Min., Mining Engineering; Phar. Pharmacy; Fr., Freshman; Soph., Sophomore; Jr., Junior; Sr., Senior; F. Yr., First Year; S. Yr., Second Year; T. Yr., Third Year; Voc., Vocational; Opt., Optional; Spec., Special.)

GRADUATE STUDENTS

Name	Course	Home Address
Alcorn, James Marcus (Oregon Agricultural College)	Agri.	Corvallis
Anderson, Edmund Gill (Oregon Agricultural College)	L. E.	Albany
Andrews, Alan (Oregon Agricultural College)	Hi. E.	Medford
Archbold, Alston Conway..... (Oregon Agricultural College)	I. A.	Hillsboro
Beck, James Obye (Oregon Agricultural College)	Agri.	Boise, Idaho
Bixby, Clarence Milton (Oregon Agricultural College)	Agri.	Freewater
Bowerman, Mrs. Elizabeth (Oregon Agricultural College)	H. E.	Fossil
Carson, Walter (Oregon Agricultural College)	Hi. E.	Hermiston
Chandler, Mrs. Belle (University of California)	Agri.	Corvallis
Corl, Leland David (Oregon Agricultural College)	M. E.	Corvallis
Cunning, Jennie (Oregon Agricultural College)	H. E.	Baker
Curran, Linnie Edith (Oregon Agricultural College)	H. E.	Corvallis
Davolt, Claude (Oregon Agricultural College)	Hi. E.	Kelso, Wash.
Dinges, Grace May (Oregon Agricultural College)	H. E.	Corvallis
Elmer, Otto Herman (Oregon Agricultural College)	Agri.	Corvallis
Gates, Fred Herbert (Stanford University)	Agri.	South Pasadena, Calif.
Gilbert, Henry (Oregon Agricultural College)	Agri.	Salem

Name.	Course.	Rank.	Home Address.
Goble, Ray Elbert (Oregon Agricultural College)	Agri.	.....	Ferndale, Calif.
Hanson, Margaret May (Oregon Agricultural College)	Opt.	.....	Corvallis
Hardman, George (Oregon Agricultural College)	Agri.	.....	Ontario
Hobgood, Guy (Oregon Agricultural College)	Agri.	.....	Madisonville, Ky.
Johnston, Jane Agnes (Oregon Agricultural College)	H. E.	.....	Corvallis
Kung, Anching (Cambridge, England)	Agri.	.....	Shanghi,, China
Lamb, John (Mississippi Agricultural College)	Agri.	.....	Brookhaven, Miss.
Mann, James Brownell (Oregon Agricultural College)	Hi. E.	.....	Portland
McCormick, Andrew (Oregon Agricultural College)	Agri.	.....	Lebanon
McFarlane, Mrs. Mary Whiting (University of Wyoming)	H. E.	.....	Corvallis
McGee, George Jose (Pennsylvania State College)	Hi. E.	.....	Corvallis
Magness, John Robert (Oregon Agricultural College)	Agri.	.....	Amity
Morgan, Carl (Washington State College)	Agri.	.....	Davenport, Wash.
Myers, Nellie (University of Idaho)	H. E.	.....	Caldwell, Idaho
Nixon, Clara (Oregon Agricultural College)	Agri.	.....	Trumansburg, N. Y.
Oakes, Charles (Oregon Agricultural College)	E. E.	.....	Corvallis
Odeen, Henry (Oregon Agricultural College)	Min.	.....	Portland
Pavey, Ralph Madison (Ohio State College)	Agri.	.....	Columbus, Ohio
Peaslee, Willis Dhu Aine (Stanford University)	E. E.	.....	Portland
Philip, Guy Lockhart (Cornell University)	Agri.	.....	Mt. Lebanon, Pa.
Reeves, Orvill Greenleaf (Oregon Agricultural College)	L. A.	.....	Corvallis
Ruth, Charles Curtis (Valparaiso University)	Agri.	.....	Corvallis
Schoth, Harry August (Oregon Agricultural College)	Agri.	.....	Oregon City
Schrepel, Minnie Anna (University of Minnesota)	H. E.	Corvallis

GRADUATE STUDENTS

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Name.	Course.	Rank.	Home Address.
Schuster, Carl Ephraim	Agri.	Corvallis
(Oregon Agricultural College)			
Shattuck, Obil	Agri.	.....	Klamath Falls
(Oregon Agricultural College)			
Siefert, Herbert William	Agri.	.....	Pasadena, Calif.
(Oregon Agricultural College)			
Strain, Clayton	Opt.	.....	Pendleton
(Oregon Agricultural College)			
Thayer, Darwin Greene	I. A.	.....	Corvallis
(Oregon Agricultural College)			
Van Gundia, Gordon Keller	Agri.	.....	Sycamore, Ohio
(Oregon Agricultural College)			
White, Samuel K.	Agri.	.....	Corvallis
(Iowa State College)			
Williamson, Charles	Opt.	.....	Corvallis
(Oregon Agricultural College)			
Wight, Howard Marshall	Agri.	.....	North Budgton
(Bates College)			
Yeager, Albert Franklin	Agri.	.....	Bazaar, Kansas
(Kansas State Agricultural College)			

UNDERGRADUATE STUDENTS

Name.	Course.	Rank.	Home Address.
Abbott, Christine Gordon.....	H. E.	Fr.	Roseburg
Abraham, Herman.....	Agri.	Sr.	Albany
Abraham, Marie Amelia.....	Com.	S. Yr.	Corvallis
Acheson, Gertrude.....	H. E.	Sr.	Portland
Acree, Louis Carlton.....	Agri.	Spec.	Alton, Missouri
Adams, Belva Lee.....	Agri.	Fr.	Corvallis
Agosti, Alfred Peter.....	Hi. E.	Fr.	Portland
Ahern, Merrie Ierne.....	H. E.	Sr.	Hugo
Ahlson, Charles Boone.....	Agri.	Fr.	Hillsdale
Aker, Homer Ferris.....	Agri.	Sr.	Chula Vista, Calif.
Akers, Robert.....	Agri.	Jr.	Portland
Albus, Fred Henry.....	Phar.	S. Yr.	Aumsville
Alcorn, William Vernon.....	Min.	Fr.	Corvallis
Alder, William John.....	Com.	F. Yr.	Victoria, B. C.
Alderman, Clifford.....	Min.	Fr.	McMinnville
Alexander, George Maxfield.....	Agri.	Fr.	Salem
Allen, Alex John.....	Agri.	Fr.	Dundee
Allen, Ethel.....	H. E.	Sr.	Corvallis
Allen, Fred John.....	Min.	Jr.	Portland
Allen, Mrs. Hattie.....	Com.	Spec.	Corvallis
Allen, Loyal Rupert.....	Min.	Fr.	Tigard
Allen, Martin Hopkins.....	Agri.	Soph.	Salem, Ohio
Allingham, William David.....	I. A.	Sr.	Corvallis
Allworth, Edward.....	Com.	Sr.	Crawford
Alpi, Rudolph Bill.....	M. A.	F. Yr.	Altadena, Calif.
Alverson, Calvin.....	Agri.	Voc.	La Conner, Wash.
Amerige, Violette Anna.....	Opt.	Soph.	Westboro, Mass.
Amis, Albert Hope.....	Agri.	Soph.	Los Angeles, Calif.
Amort, Albert Alexander.....	C. E.	Sr.	Corvallis
Amort, Paul Francis.....	I. A.	Sr.	Corvallis
Anawalt, Clinton La Verne.....	Agri.	Fr.	Jordan Valley
Anderson, Albert Thomas.....	L. E.	Spec.	Astoria
Anderson, Esther Anna.....	H. E.	Voc.	Dallas
Anderson, Henry.....	E. E.	Spec.	Aberdeen, Wash.
Anderson, Otto Ervin.....	Agri.	Voc.	Ilwaco, Wash.
Anderson, William.....	C. E.	Jr.	Portland
Anderton, Edwin Caldwell.....	Agri.	Fr.	Council Bluffs, Iowa
Andrews, Winfield.....	Agri.	Jr.	San Luis Obispo, Calif.
Antonsen, Charles Homer.....	Agri.	Fr.	Vergas, Minn.
Archibald, Harold Gilbert.....	For.	Sr.	Albany
Arens, Winfield Bernard.....	Com.	Jr.	New York City, N. Y.
Armitstead, Amy Isabella.....	H. E.	Fr.	Portland
Armstrong, Fay.....	Opt.		Corvallis
Armstrong, Jessie.....	Opt.		Jefferson
Arnold, Marjorie.....	H. E.	Fr.	Portland
Asbahr, Katherine.....	H. E.	Soph.	Cornelius

UNDERGRADUATE STUDENTS

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Name.	Course.	Rank.	Home Address.
Atwood, Cyrus Leslie.....	Com.	Soph.	Corvallis
Atwood, Elmina Gladys.....	H. E.	Sr.	Corvallis
Atwood, Ralph Guile.....	Agri.	Jr.	Corvallis
Ault, Byrd Moore.....	Agri.	Sr.	Enterprise
Austin, Helen May.....	H. E.	Sr.	Aberdeen, Wash.
Auterson, Jane Elizabeth.....	H. E.	Fr.	Portland
Averill, William Samuel.....	Agri.	Jr.	Corvallis
Avery, Ruth Anna.....	H. E.	Spec.	Klamath Falls
Axtell, Edward Goodchild.....	Agri.	Jr.	Corvallis
Babbitt, Richard Carrick.....	Phar.	Jr.	Corvallis
Bailey, Lucile.....	H. E.	Spec.	Lakeview
Bailey, Willis Arthur.....	Agri.	Jr.	Nicolet Falls, Quebec
Bair, Ray Elmer.....	Agri.	Fr.	Fossil
Bajpai, Ram Lal.....	Agri.	Fr.	Nagpur, India
Baldwin, Frank Timmons.....	Agri.	Sr.	Bakersfield, Calif.
Baldwin, James Daniel.....	Agri.	Soph.	Blue Lake, Calif.
Baldwin, Lee Ernest.....	Phar.	Sr.	Winlock, Wash.
Ball, Harold.....	Agri.	Soph.	National City, Calif.
Ball, Waldo Whitney.....	Phar.	Spec.	Corvallis
Ball, Wilbur Herbert.....	M. E.	Jr.	Portland
Ballard, Frank Llewellyn.....	Agri.	Sr.	Meredith, N. H.
Ballin, Herbert August.....	Agri.	Sr.	Portland
Bannister, Edna Mary.....	H. E.	Sr.	Weston
Banta, Glenn.....	Agri.	Soph.	Selah, Wash.
Barber, Lucile.....	Com.	Spec.	Ashland
Barber, Roy.....	Min.	Fr.	Salem
Barker, Clifford Dudley.....	Phar.	Spec.	Roseburg
Barden, Una Marguerite.....	H. E.	Sr.	Helena, Mont.
Barklow, Ervin Earl.....	Agri.	Fr.	Norway
Barnes, Cecile Frances.....	H. E.	Voc.	Goldendale, Wash.
Barnes, Clay Aaron.....	Agri.	Sr.	Goldendale, Wash.
Barnes, Dewitt Leonard.....	Com.	Spec.	Goldendale, Wash.
Baron, Joseph Philip.....	Agri.	Fr.	Linne, Calif.
Barratt, Marjorie Marian.....	H. E.	Fr.	Portland
Barrett, Gerald Joseph.....	Min.	Fr.	Portland
Bartholomew, Hazel.....	H. E.	Voc.	Corvallis
Bartruff, Elmer Walter.....	Agri.	Jr.	Salem
Bartu, Frank.....	M. E.	Jr.	Crabtree
Barzee, Pearl Faye.....	Com.	Jr.	Corvallis
Basler, Vernon.....	Agri.	Soph.	Grants Pass
Bassett, Florence Kinsey.....	Com.	Fr.	Newberg
Bassett, Olive Pauline.....	H. E.	Sr.	Newberg
Bates, Douglas.....	E. E.	Soph.	Portland
Bates, Floyd Everett.....	Agri.	Fr.	Salem
Bath, Gerald.....	Com.	Spec.	Tacoma, Wash.
Baum, Francis Hutchins.....	Agri.	Fr.	Portland
Baum, Olin Huntington.....	Agri.	Sr.	Portland
Bayliss, Edwin John Charles.....	Agri.	Jr.	Carlton

Name.	Course.	Rank.	Home Address.
Bayliss, John Clifford.....	Phar.	S. Yr.	Myrtle Creek
Bayley, Ewart Gladstone.....	Agri.	Voc.	Toowoomba, Australia
Bayley, Ralph Olaf.....	Agri.	Jr.	Pittsworth, Australia
Beals, Agnes.....	H. E.	Sr.	Corvallis
Beardsley, Florence Ellen.....	Opt.		Corvallis
Beard, Edward Arthur.....	M. E.	Soph.	Astoria
Beatie, Charles Fountain.....	Min.	Fr.	Oregon City
Bechen, Carl George.....	Agri.	Fr.	Hillsboro
Bechen, Ella.....	Com.	Fr.	Hillsboro
Bechen, Martha Henrietta.....	H. E.	Soph.	Hillsboro
Beck, Ralph.....	Agri.	Fr.	Corvallis
Becker, Abraham Frank.....	Phar.	Spec.	Independence
Beers, Ruby Evangeline.....	H. E.	Jr.	Corvallis
Behnke, Olive Greene.....	H. E.	Sr.	Florence
Belknap, Queen Inez.....	Opt.		Corvallis
Bellinger, Gordon Vanheuran.....	For.	Soph.	Moscow, Idaho
Bellinger, Wilbur Moore.....	Agri.	Fr.	Moscow, Idaho
Bellows, Harold Clinton.....	Com.	Fr.	Roseburg
Bendler, Georgina Bertha.....	H. E.	Fr.	Cornelius
Benham, Frank Norman.....	Agri.	Soph.	Seattle, Wash.
Bennett, Arthur Aldrich.....	M. E.	Sr.	Dallas
Bennett, Cecil Howard.....	E. E.	Soph.	Rainier
Benson, Robert Rowe.....	Agri.	Voc.	Pasadena, Calif.
Berchtold, Florence Ernestine.....	H. E.	Fr.	Corvallis
Bernard, Ruth.....	Opt.		Lakeview
Bernstein, Salome Solis-Cohen.....	H. E.	Sr.	Portland
Bettis, James Oliver.....	Agri.	Soph.	Portland
Berven, Edmund Sigurd.....	Min.	Soph.	Corvallis
Betts, Fred.....	Agri.	Spec.	Weiser
Biesen, Valeska.....	H. E.	Voc.	Portland
Billie, Brewer Astor.....	For.	Spec.	Astoria
Binswanger, Alvin Otto.....	Agri.	Sr.	Portland
Birch, Gracia Delle.....	H. E.	Soph.	Corvallis
Bishop, Leon N.....	Min.	Fr.	Halsey
Bissell, Rex Ide.....	M. A.	S. Yr.	Yreka, Calif.
Bissell, Ross Elder.....	Hi. E.	Soph.	Yreka, Calif.
Bissett, Lee Henry.....	Agri.	Soph.	Helio
Bixby, Clarence Wilson.....	Com.	Soph.	Paulina
Black, Kathleen.....	H. E.	Fr.	Medford
Black, Burr.....	Agri.	Sr.	Corvallis
Black, Mildred.....	H. E.	Jr.	Corvallis
Black, William Merle.....	Agri.	Spec.	Medford
Blackwell, Harlie Allen.....	M. E.	Spec.	Corvallis
Blagg, Henry.....	E. E.	Jr.	Juneau, Alaska
Blake, Ruth Lucille.....	Opt.	Jr.	Hood River
Blakely, Cecil Grant.....	Com.		Portland
Blakely, Edward.....	Phar.	Jr.	Dixonville
Blakely, Lloyd Herbert.....	I. A.	F. Yr.	Stayton

UNDERGRADUATE STUDENTS

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Name.	Course.	Rank.	Home Address.
Blakely, Violet Rose.....	Com.	Jr.	Corvallis
Boardman, Claire Christine.....	H. E.	Spec.	Corvallis
Bodine, Roger Campbell.....	For.	Voc.	Dixonville
Bogard, Troy.....	Agri.	Fr.	Pasadena, Calif.
Boggess, John Willis.....	M. E.	Soph.	Woodburn
Boies, Etta Philippi.....	H. E.	Fr.	Veneta
Boldenweck, Louis Charles.....	Agri.	Sr.	Corvallis
Bolin, Frank Gerold.....	Agri.	Voc.	Portland
Bond, Ruel.....	Agri.	Fr.	Corvallis
Bones, John W.....	C. E.	Jr.	Carlton
Bonner, George.....	Agri.	Fr.	London, England
Bonner, Joe Henry.....	M. E.	Fr.	Corvallis
Boone, Earl.....	M. E.	Jr.	Toledo, Wash.
Boone, John Carlyle.....	M. E.	Jr.	Toledo, Wash.
Boon, Walter William.....	Agri.	Soph.	Portland
Boquist, Alfred.....	Agri.	Fr.	Tillamook
Bower, Hazel Harriet.....	Opt.		Corvallis
Boss, Reuben.....	Agri.	Fr.	Corvallis
Bowes, Mary Jane.....	Com.	Voc.	Aberdeen, Wash.
Boyer, Will.....	Min.	Sr.	Portland
Bracons, Enola.....	H. E.	Fr.	Portland
Bracons, Josephine.....	H. E.	Sr.	Portland
Bragg, Clarence Harvey.....	Agri.	Fr.	Corvallis
Bragg, Harry Leon.....	Com.	F. Yr.	Corvallis
Brandes, Alan Carl.....	Min.	Fr.	Portland
Brandes, Irene.....	H. E.	Sr.	Portland
Branland, Verner Carl.....	Com.	Spec.	Colton
Branstetter, Myrtle Esther.....	Phar.	F. Yr.	Echo
Branthoover, Lester Lee.....	Com.	Jr.	Payette, Idaho
Bravinder, Ray Ross.....	Agri.	Spec.	Portland
Breithaupt, Alva.....	Agri.	Fr.	Portland
Brennan, Andrew Frank.....	For.	Fr.	Boise, Idaho
Brett, Sereno Elmer.....	For.	Sr.	Portland
Brewer, Grace Marie.....	H. E.	Sr.	Portland
Briggs, Merle.....	Agri.	Fr.	La Grande
Briggs, William Louis.....	Agri.	Voc.	Hilgard
Brogden, Cecil.....	H. E.	Soph.	Hillsboro
Brooke, John Rutter.....	Min.	Soph.	Vancouver, Wash.
Brownell, Dorothy Southwick.....	H. E.	Sr.	Portland
Brown, Donald Edgar.....	Agri.	Sr.	Oregon City
Brown Edward Guy.....	Com.	Spec.	New York City, N. Y.
Brown, Francis Bolden.....	Agri.	Jr.	Crystal
Brown, Lark Olaf.....	H. E.	Soph.	Warrenton
Brown, Waldo Frank.....	Agri.	Fr.	New Era
Brown, Walter Daniel.....	Agri.	Fr.	Medford
Brown, Zoe Agnes.....	H. E.	Sr.	Seaside
Bruhn, Jack Mortimer.....	Agri.	Fr.	Portland
Bruhn, Rosa Minnie.....	H. E.	Spec.	Dayton

Name.	Course.	Rank.	Home Address.
Bryant, Claude Hale.....	Agri.	Jr.	Gaston
Buchanan, Bayard.....	Hi. E.	Sr.	Roseburg
Budelier, Clarence Joseph.....	L. E.	Jr.	Rock Island, Ill.
Bullis, Deloss Everett.....	E. E.	Jr.	Payette
Burleigh, Donald Miller.....	M. E.	Soph.	Redmond
Burley, Stephen Brace.....	Com.	F. Yr.	La Grande
Burnell, Ina Ruth.....	H. E.	Sr.	Claremont, Calif.
Burns, John Richard.....	Min.	Jr.	Portland
Burns, Ralph Wilson.....	Agri.	Sr.	Glendive, Mont.
Burnside, Julian Bates.....	Agri.	Fr.	Seattle, Wash.
Bush, Carl Lee.....	Agri.	Fr.	Hoskins
Bush, Zetta Zeretta.....	H. E.	Fr.	Hoskins
Butt, Ralph.....	Com.	Soph.	Newberg
Byers, Oscar.....	For.	Soph.	Portland
Cady, Allen.....	Com.	Fr.	Corvallis
Cain, Grace Iva.....	Opt.		Corvallis
Caldwell, Alice Marie.....	H. E.	Voc.	Bend
Caldwell, Ruth Florence.....	H. E.	Fr.	Bend
Caldwell, Wally.....	Hi. E.	Soph.	San Dimas, Calif.
Calkins, Claude Clark.....	Agri.	Jr.	Airlie
Campbell, Cora Alice.....	Com.	Spec.	Roseburg
Campbell, Donald Neil.....	Com.	Fr.	Portland
Campbell, Fannie Marie.....	Com.	Spec.	Roseburg
Carley, Marguerite.....	H. E.	Soph.	Montpelier, N. D.
Carlson, Ruth.....	Com.	Sr.	Portland
Carnie, Norval Craigie.....	Agri.	Jr.	Chicago, Ill.
Carpenter, Eugene Johnson.....	Agri.	Sr.	Ashland
Carpenter, George Washington.....	M. E.	Soph.	Washougal, Wash.
Carpenter, Walter Squire.....	Agri.	Soph.	Ashland
Carroll, Rebecca Maurine.....	H. E.	Sr.	Harrisburg
Carswell, John William.....	Min.	Fr.	Roseburg
Carter, Claire Mary.....	H. E.	Fr.	Aberdeen, Wash.
Carter, Hallie Lenore.....	H. E.	Jr.	Eugene
Cary, Carl Verne.....	Agri.	Spec.	Corvallis
Case, Mary.....	H. E.	Fr.	Kalama, Wash.
Case, Russell Jeffery.....	Agri.	Sr.	Vancouver, Wash.
Case, Ruth E.....	Opt.		Kalama, Wash.
Case, Theodore Dwight.....	Agri.	Soph.	Klamath Falls
Casebeer, Mae.....	H. E.	Spec.	Bly
Casey, John Michael.....	L. E.	Fr.	Portland
Casper, Elsie Beaulah.....	H. E.	Sr.	Union
Casteel, Drusilla.....	H. E.	Soph.	Eugene
Castle, Carrie Ethel.....	H. E.	Spec.	Wauseon, Ohio
Cavender, Alberta.....	H. E.	Sr.	Portland
Catherwood, Edith.....	Com.	Fr.	Dallas
Chambers, Dorothy.....	H. E.	Fr.	Newberg
Chambers, George Frederick.....	Min.	Sr.	Newberg
Champlin, Lydia Woodward.....	H. E.	Sr.	Tacoma, Wash.

Name.	Course.	Rank.	Home Address.
Chapman, Earle Hoyting.....	For.	Fr.	Rivera, Calif.
Chapman, John Cecil.....	Min.	Soph.	Sheridan
Chase, Elmo Bary.....	Agri.	Fr.	Eugene
Chellis, Lawrence True.....	I. A.	Soph.	Astoria
Christensen, Hazel Marie.....	H. E.	Fr.	Portland
Christensen, Henry Noris.....	Agri.	Fr.	Portland
Churchill, Leigh Howard.....	Agri.	Soph.	Corvallis
Churchman, Tressa.....	Com.	Soph.	Corvallis
Churchwright, Clara.....	Opt.		Astoria
Clancy, James Patrick.....	L. E.	Soph.	Woodland, Wash.
Clark, Cedric William.....	Com.	Spec.	Canyon City
Clark, Doris Aileen.....	H. E.	Soph.	Portland
Clark, Frank Lewis.....	Agri.	Spec.	Portland
Clark, James Holbert.....	Agri.	Soph.	Mattoon, Ill.
Clark, Ola LaMoine.....	H. E.	Jr.	Salem
Clarke, William Victor.....	Agri.	Jr.	Laytonville, Calif.
Clock, Audrey.....	Com.	Jr.	The Dalles
Close, Wilbur Lawrence.....	Agri.	Spec.	Corvallis
Coe, Earl Alphonso.....	Agri.	Soph.	Portland
Coffey, Jay Russell.....	Agri.	Spec.	Corvallis
Coffey, Wilson Bryan.....	Agri.	Fr.	Portland
Cohen, Benjamin Bernard.....	Agri.	Sr.	Portland
Cole, Harry Julius.....	Com.	Soph.	Emporia, Kansas
Coleman, Lloyd Wilbur.....	Agri.	Soph.	Berkeley, Calif.
Coleman, Ralph Orval.....	Agri.	Soph.	Newport
Collins, Robert.....	Agri.	Spec.	Portland
Coman, Ellis Seymour.....	For.	Fr.	Covina, Calif.
Cone, Earl Trumman.....	Com.	S. Yr.	Donald
Connell, Arthur Wood.....	Agri.	Fr.	Hillsboro
Conner, Edna Clara.....	H. E.	Jr.	Sheridan
Conner, Evangeline.....	Com.	Spec.	Corvallis
Constable, Ora Elizabeth.....	H. E.	Fr.	Salem
Conyers, Kit Carson.....	Com.	Soph.	Clatskanie
Cooley, Florence Mable.....	Phar.	Sr.	Junction City
Cooley, Inez.....	Phar.	Sr.	Junction City
Cooper, Altha Opal.....	Com.	Fr.	Corvallis
Cooper, Howard Laraway.....	M. E.	Fr.	Hood River
Cooper, Howard Wesley.....	E. E.	Soph.	Milwaukie
Corey, Glen.....	E. E.	Soph.	Hood River
Corl, Frances Helen.....	H. E.	Sr.	Corvallis
Cornell, Edna Frances.....	H. E.	Sr.	Grants Pass
Cornwall, Alice Ellen.....	H. E.	Jr.	Portland
Corum, Curtis Lee.....	Min.	Soph.	The Dalles
Cory, William McKinley.....	Agri.	Fr.	Etna Mills, Calif.
Couch, Leo King.....	Agri.	Soph.	Wallowa
Couch, Roy.....	Agri.	Soph.	La Grande
Counts, Wilda.....	H. E.	Soph.	Grants Pass
Cowley, John Farnum.....	Min.	Fr.	Central Point

Name.	Course.	Rank.	Home Address.
Cox, Mrs. Gertrude Cleveland	Com.	Spec.	Corvallis
Crain, William Wallace	Agri.	Sr.	Biggs, Calif.
Cramer, Floyd Samuel	M. E.	Fr.	Corvallis
Cramer, Theodore Putnam	Com.	Soph.	Grants Pass
Crane, Jr., Fred Hovey	Agri.	Soph.	Fairview
Craven, Clair Glen	Agri.	Voc.	Meda
Crawford, Eda Maude	H. E.	Spec.	The Dalles
Crawford, Hugh Herman	Agri.	Soph.	San Dimas, Calif.
Crawford, James Arthur	L. E.	Spec.	Burlington, Iowa
Creighton, Leland David	M. E.	Sr.	Portland
Crittenden, Marjorie Elizabeth	H. E.	Fr.	Portland
Cronemiller, Fred Parks	For.	Jr.	Lakeview
Croswhite, John Raymond	Agri.	Soph.	Corvallis
Crout, Mildred	H. E.	Soph.	Portland
Crouter, Paul Henry	Agri.	Sr.	Union
Crum, McKinley	Agri.	Spec.	Olex
Cummings, Wilson	Agri.	Voc.	Los Angeles, Calif.
Cunning, William	Agri.	Soph.	Baker
Cunningham, Bessie Alta	Com.	Fr.	Woodburn
Curl, Cecil Charles	Agri.	Fr.	Pendleton
Currey, Joseph Edmond	Agri.	Sr.	Olympia
Currey, Pinney Alfred	Phar.	Spec.	Baker
Currin, Mary Edith	H. E.	Jr.	Heppner
Curry, Fred Martin	Phar.	Soph.	Albany
Cyrus, William Fletcher	Agri.	Fr.	Corvallis
Dadmun, Orin	Hi. E.	Fr.	Independence
Dalgity, James Weston	M. A.	S. Yr.	Wrangell, Alaska
Dallas, Earle Wesley	Agri.	Fr.	Corvallis
Damon, Robert Elbridge	Agri.	Soph.	Ferndale, Calif.
Damon, Ruth Columbia	H. E.	Jr.	Corvallis
Daniel, Clarence	E. E.	Fr.	Monmouth
Daniells, Hugh Orrin	Agri.	Fr.	Coeur d' Alene, Idaho
Darby, Una	H. E.	Fr.	Silverton
Darling, Lois Winnifred	H. E.	Spec.	Corvallis
Darling, Ruth Jessie	Opt.		Corvallis
Davidson, Harold Argus	Agri.	Soph.	Meridian, Idaho
Davidson, Leffie Florence	H. E.	Sr.	Portland
Davidson, Robert Herschel	Agri.	Sr.	Meridian, Idaho
Davis, Charles Elwyn	Agri.	Sr.	Union
Davis, Edgar Willis	For.	Fr.	Corvallis
Davis, LaNoel Bernard	Min.	Fr.	Salem
Davis, Mabelle Josephine	H. E.	Jr.	Corvallis
Davis, Merton	Agri.	Spec.	Union
Davis, Percy Everett	Agri.	Soph.	Albany
Davissan, Frances Louise	H. E.	Fr.	Central Point
Dearmin, Lillian Gertrude	Com.	Spec.	Baker
DeLosh, Beaumont Thomas	Com.	Soph.	Aberdeen, Wash.
Dement, Harry George	Com.	Soph.	Myrtle Point

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Name.	Course.	Rank.	Home Address.
Denniston, Laneta.....	H. E.	Soph.	McMinnville
Detering, William.....	Min.	Fr.	Portland
DeWitt, Charles.....	Agri.	Soph.	Portland
Dickerson, Jesse Earl.....	Agri.	Jr.	Parma, Idaho
Dickinson, Leroy Foster.....	For.	Fr.	Castle Rock, Wash.
Ding, Edward Ralph.....	Agri.	Fr.	Portland
Ding, Frank Gow.....	E. E.	Fr.	Portland
Dodge, Mrs. Elizabeth Folger.....	H. E.	Spec.	Medford
Doerner, Armin Meredith.....	Agri.	Sr.	Denver, Colo.
Donahue, Kathryn Rose.....	H. E.	Voc.	Scio
Doolittle, George.....	Min.	Fr.	Corvallis
Doolittle, Harold VanRensselaer.....	Agri.	Sr.	Pomona, Calif.
Doolittle, Maida Laura.....	H. E.	Sr.	Corvallis
Dopp, Eugene.....	I. E.	Fr.	Forest Grove
Dorman, James.....	Agri.	Spec.	Corvallis
Dorris, Zed.....	Agri.	Soph.	Central Point
Doty, Paul Edward.....	Agri.	Jr.	Pasadena, Calif.
Dougherty, Helen Frances.....	H. E.	Soph.	Baker
Douglas, Earle.....	Phar.	Fr.	Grants Pass
Douglas, Olin Eugene.....	Phar.	Jr.	Grants Pass
Doukas, Samuel James.....	E. E.	Fr.	Prince Rupert, B. C.
Down, John Rosco.....	M. E.	Fr.	Joseph
Downs, Addie Isabella.....	Phar.	Sr.	Canby
Dryden, Winfield Joseph.....	Agri.	Fr.	Corvallis
Dufall, Esther Frances.....	H. E.	Fr.	Tacoma, Wash.
Duncan, Ernest Earl.....	Min.	Fr.	Albany
Duniway, Robert Edward.....	M. E.	Fr.	Portland
Dunn, Edwin.....	Agri.	Jr.	Ashland
Dunn, Mary.....	Phar.	F. Yr.	Sumpter
Dunning, Eva Marinda.....	H. E.	Fr.	Stanfield
Dunning, Marilla Carrie.....	H. E.	Fr.	Stanfield
Du Rette, Cecil.....	M. A.	S. Yr.	Gervais
Dutton, George Lawrence.....	Agri.	Fr.	Concordia
Dye, Charlotte Evangeline.....	H. E.	Fr.	Oregon City
Dye, Everett Willoughby.....	M. E.	Soph.	Oregon City
Dyson, Lizzie.....	H. E.	Soph.	Dahlia, Wash.
Eakin, John Jack.....	Agri.	Fr.	Rickreall
Eames, DeLin.....	M. A.	S. Yr.	Cordova, Alaska
Eastman, Eugene Harold.....	Min.	Spec.	Portland
Eaton, Frances.....	H. E.	Fr.	Independence
Ebinger, Harvey.....	Phar.	S. Yr.	Tillamook
Eckley, Winfield.....	E. E.	Sr.	La Grande
Edwards, Hermon.....	E. E.	Fr.	Monroe
Edwards, James Homer.....	Agri.	Jr.	Monroe
Egan, Homer William.....	Agri.	Spec.	Gervais
Ellestad, Melven Herman.....	M. A.	T. Yr.	Central Point
Elliott, Dorcas May.....	H. E.	Fr.	Vancouver, Wash.
Elmer, Esther Stout.....	H. E.	Voc.	Corvallis

Name.	Course.	Rank.	Home Address.
Emery, Parris Everett.....	Min.	Fr.	Portland
Emett, Edward Llewellyn.....	Agri.	Jr.	Alhambra, Calif.
Engbretson, Albert Edward.....	Agri.	Sr.	Astoria
Englund, Eric.....	Agri.	Soph	Trehorningsjo, Swed'n
English, Pennoyer Francis.....	Agri.	Fr.	Salem
Entermille, Jr., Fred.....	Agri.	Fr.	Baker
Epps, Grady David.....	Min.	Fr.	Hinton, Okla.
Erp, Hermann.....	Agri.	Voc.	Grays River, Wash.
Etsell, George.....	Agri.	Spec.	Seattle, Wash
Evans, Dorothy.....	H. E.	Spec.	Roseburg
Evans, Emmett.....	Min.	Fr.	McMinnville
Feathers, Mabel Etta.....	H. E.	Soph.	Salem
Fellows, Hurley.....	Agri.	Soph	Oregon City
Felton, Dannie Sherman.....	Com.	Soph	Corvallis
Fendall, DeVere.....	Agri.	Sr.	Newberg
Fendall, Virgil.....	Agri.	Sr.	Newberg
Ferguson, Alice.....	H. E.	Fr.	Helix
Ferguson, Arthur.....	Agri.	Jr.	Helix
Fertig, Charles Arthur.....	L. E.	Jr.	Hood River
Ferguson, Catherine Bruce.....	H. E.	Voc.	Roseburg
Ferguson, Homer.....	M. E.	Soph.	Portland
Ferguson, Oscar Earl.....	Agri.	Sr.	Helix
Finch, Arthur William.....	Agri.	Sr.	Gardena, Calif.
Finney, John Lawrence.....	Agri.	Soph.	Astoria
Firestone, Verne Chester.....	Agri.	Soph.	Vancouver, Wash.
Fisher, Bertha Marie.....	H. E.	Fr.	Haines
Fisher, Elmer.....	Min.	Fr.	Corvallis
Fisher, Harrison David.....	Agri.	Voc.	Cincinnati, Ohio
Fisk, Carlos.....	Agri.	Sr.	Parma, Idaho
Fitts, Grace Elizabeth.....	H. E.	Sr.	Corvallis
Flanery, Floyd.....	Phar.	Jr.	Corvallis
Flegal, Kate Susannah.....	H. E.	Fr.	Eugene
Fleischman, Carl Julius.....	Com.	Spec.	Corvallis
Fleming, Homer Robert.....	Agri.	Soph.	Joseph
Floss, Fritz Carl.....	Min.	Sr.	Milwaukie
Floydstead, Harry.....	Com.	Soph.	Tacoma, Wash.
Foley, James Owen.....	Phar.	Fr.	Corvallis
Forbes, Ernest Stuart.....	M. E.	F. Yr.	Central Point
Forbis, Robert.....	Hi. E.	Fr.	Dilley
Forest, Bernice Marian.....	H. E.	Soph.	Portland
Forster, Fred Henry.....	Hi. E.	Sr.	Tangent
Fortner, Philip Tuthill.....	Agri.	Soph.	Fowler, Calif.
Foster, Albert Dickinson.....	Phar.	Sr.	Dayton
Foster, Harriett.....	H. E.	Sr.	Corvallis
Fox, Kenneth Lawrence.....	Min.	Sr.	Portland
Fox, Otto.....	I. A.	Fr.	Ashland
Frame, Dana Selby.....	Agri.	Soph.	Talent
Frances, George Leslie.....	Agri.	Sr.	Portland

Name.	Course.	Rank.	Home Address.
Francis, Thomas Ernest.....	Agri.	Sr.	Bunkerville, Va.
Franklin, John Morton.....	Agri.	Jr.	Seattle, Wash.
Fraser, Irene McCoy.....	H. E.	Fr.	Corvallis
Fraser, John Henry.....	C. E.	Sr.	Parkplace
Fraser, Tom Henry.....	Agri.	Fr.	Corvallis
Frazier, Genevieve.....	Opt.		Salem
Freeland, Elsie Lucille.....	Agri.	Fr.	Shedd
Freeland, Eugene Louis.....	Min.	Fr.	Shedd
French, Irvine.....	Min.	Soph.	Enterprise
Freyler, Edna May.....	H. E.	Soph.	Corvallis
Fridley, Dora Ann.....	H. E.	Sr.	Klondike
Fridley, Nettie May.....	H. E.	Jr.	Klondike
Friedman, David.....	Agri.	Jr.	St. Charles, Ill.
Prink, Ellis Pearl.....	Min.	Fr.	Newberg
Frizzell, Elsie Echo.....	H. E.	Fr.	Rickreall
Frost, Carl Magnus.....	E. E.	Sr.	Portland
Fudge, Lawrence.....	E. E.	Fr.	Ballston
Fullerton, Charles Elwyn.....	Com.	Fr.	Olympia, Wash.
Funk, Arnold John.....	Com.	Sr.	Corvallis
Galbraith, Alexander.....	Agri.	Spec.	Langdon Hills, Eng.
Galbraith, Loren.....	M. E.	Fr.	Vancouver, Wash.
Gale, Marguerite.....	H. E.	Voc.	Union
Gammon, Earle Thomas.....	Agri.	Soph.	Hood Calif.
Garbutt, Earl Edward.....	M. E.	Soph.	Sheridan, Wyom.
Gardner, Isaac George.....	E. E.	Fr.	Lansing, Mich.
Gardner, Vesta Hazyl.....	H. E.	Fr.	Salem
Garrett, Geary.....	Com.	Spec.	Medford
Garvin, Victor James.....	Agri.	Sr.	Denver, Colo.
Gatchell, Charles Barnard.....	I. A.	Spec.	Peachbottom, Pa.
Gates, Pearl Emmogene.....	H. E.	Sr.	Corvallis
Genoud, Orlean.....	Phar.	F. Yr.	Camas, Wash.
Gentle, James.....	Agri.	Spec.	Monmouth
Gerke, Walter Henry.....	Agri.	Sr.	Portland
Gibson, Clarence Blaine.....	Opt.		Guthrie Center, Iowa
Gilbert, Mahlon Bruce.....	Agri.	Sr.	Woodburn
Gillfillan, Francois Archibald.....	Phar.	Fr.	Delmar
Glines, Emma Ione.....	H. E.	Soph.	Waldport
Glines, Hallie Winifred.....	H. E.	Soph.	Waldport
Gloman, Joseph Storey.....	Agri.	Soph.	Bellingham, Wash.
Glos, Karl Fredrick.....	Com.	Spec.	Corvallis
Godel, Howard Fisher.....	Agri.	Soph.	Portland
Godlove, Lenore,.....	Com.	F. Yr.	Medford
Goe, Henry.....	Agri.	Spec.	Canton, China
Goemanpott, Etta Oekeleine.....	H. E.	Fr.	Phoenix
Golden, Arthur Edward.....	Agri.	Fr.	Corvallis
Golden, Zoe Hazel.....	H. E.	Jr.	Corvallis
Goodrich, Lee Jesse.....	Agri.	Spec.	Seattle, Wash.
Goodrich, Meda.....	H. E.	Fr.	Yamhill

Name.	Course.	Rank.	Home Address.
Gordon, Will Hughes.....	Com.	Soph.	Portland
Gould, Mabel Lillian.....	H. E.	Fr.	Medford
Graf, Herman.....	M. E.	Sr.	Portland
Gragg, George Merle.....	Agri.	Jr.	Monroe
Graham, Earl Alvin.....	Phar.	Fr.	Baker
Grasmoen, Otto Melvin.....	M. E.	Fr.	Le Grand, Calif.
Graves, Leaman.....	Agri.	Soph.	Kansas City, Kansas
Graybeal, Carlyle West.....	Agri.	Fr.	Cashmere, Wash.
Green, Carl Clifford.....	Agri.	Jr.	Parkdale
Green, Dorr Dudley.....	Agri.	Jr.	Parkdale
Greene, Frances Kellaly.....	Agri.	Sr.	Aberdeen, Wash.
Green, Howard Henry.....	Agri.	Voc.	Parkdale
Green, John Wesley.....	C. E.	Sr.	Crawfordsville
Greene, Marjorie May.....	H. E.	Fr.	Aberdeen
Green, Medric.....	Agri.	Soph.	Dundee
Gregg, Rodney.....	M. E.	Soph.	Gazelle, Calif.
Grell, Edward.....	Agri.	Fr.	Albany
Grenfell, Charles Waldo.....	Min.	Soph.	Portland
Gribskov, Maren.....	H. E.	Soph.	Junction City
Griffin, Earl.....	For.	Fr.	Ontario
Grimes, Etta Belle.....	H. E.	Jr.	Portland
Grow, Homer Wallace.....	Agri.	Soph.	Corvallis
Grubbe, Eugene Erle.....	Phar.	Soph.	Elkton
Guha, DakshinaRanjan.....	M. E.	Sr.	India
Gurley, Wayne E.....	E. E.	Soph.	Canby
Gurney, Elsie Genevieve.....	H. E.	Spec.	Eugene
Guthrie, Eunice Jane.....	H. E.	Spec.	Corvallis
Guthrie, Leroy Roland.....	M. E.	Soph.	Corvallis
Haberer, Erwin Sam Otto.....	For.	Fr.	Chicago, Ill.
Hackett, Harold Nelson.....	E. E.	Sr.	Elgin
Hacking, Ruth Isabelle.....	Com.	Spec.	Corvallis
Haight, Rachel Webb.....	H. E.	Spec.	Corvallis
Halferty, George.....	Agri.	Soph.	Aberdeen, Wash.
Hallock, Clarence Elmer.....	Agri.	Fr.	Payette, Idaho
Hall, Eleanor.....	Opt.		Union
Hall, Phila Henrietta.....	H. E.	Spec.	Fairfax, Vt.
Hallock, Earle Dutton.....	Agri.	Sr.	Portland
Hamilton, Gladys.....	H. E.	Voc.	Corvallis
Hamilton, Harry Earl.....	M. E.	Sr.	Portland
Hamilton, John Monroe.....	Agri.	Sr.	National City, Calif.
Hamlin, Lucile Anna.....	Opt.		Corvallis
Hammerly, Hugh Fisher.....	Phar.	Sr.	Albany
Hammond, Edmund Putnam.....	M. E.	Fr.	Portland
Hammond, Josephine Marion.....	H. E.	Soph.	Silverton
Hammond, Louise Leontine.....	H. E.	Spec.	North Bend
Hampton, Lester.....	Agri.	Soph.	Randle, Wash.
Hampton, Otis Harold.....	Agri.	Soph.	Pendleton
Hancock, Charles Shannon.....	E. E.	Fr.	Forest Grove

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Name.	Course.	Rank.	Home Address.
Hancock, Margaret Mae.....	Com.	Spec.	Forest Grove
Hanley, Mike Finley.....	Agri.	Voc.	Medford
Hanneman, Karl.....	Agri.	Spec.	Long Beach, Wash.
Hanns, Satolli William.....	I. A.	Soph.	Corvallis
Hansen, Harold, Von Stein.....	Com.	Soph.	Corvallis
Hansen, Henry.....	For.	Fr.	Woodburn
Hansen, Ingeborg Anna.....	H. E.	Soph.	Corvallis
Hanson, Manette.....	H. E.	Sr.	Corvallis
Hanthorn, Faith.....	H. E.	Jr.	Portland
Happold, Louie.....	E. E.	Soph.	Klondike
Hardman, Florence Rozelle.....	Com.	Soph.	Corvallis
Harper, Roy.....	Min.	Fr.	Woodburn
Harriman, Dickson Pain.....	Agri.	Fr.	The Dalles
Harris, Clifford Oscar.....	Agri.	Fr.	Portland
Harris, Milton.....	C. E.	Jr.	Portland
Harrison, Dorothy Elizabeth.....	H. E.	Spec.	Los Molinos, Calif.
Harrison, Leslie Edwin.....	Phar.	Soph.	Tillamook
Harrison, Lloyd.....	Agri.	Fr.	Oregon City
Hart, Martha Norden.....	H. E.	Sr.	Portland
Hart, Ruth Genevieve.....	Com.	Spec.	La Grande
Hartley, Edwin Adolphus.....	For.	Jr.	Point Terrace
Hartman, Orville Ernest.....	Agri.	Fr.	Corvallis
Hartzog, Mary Delphia.....	H. E.	Sr.	Corvallis
Harvey, Paul Atwood.....	Agri.	Sr.	Cashmere, Wash.
Hathaway, Marcus Francis.....	Agri.	Sr.	Corvallis
Hattan, Elton.....	Min.	Soph.	Oregon City
Haumeser, Elsie.....	H. E.	Voc.	Battle Ground, Wash.
Haverstick, Russell Noah.....	Agri.	Sr.	Cashmere, Wash.
Haw, Horace Leo.....	Agri.	Sr.	Pendleton
Hawkins, Joe Cephus.....	Agri.	Jr.	Sayre, Okla.
Hayes, Frank.....	Agri.	Jr.	Pasadena, Calif.
Hayes, Jack Joseph.....	Com.	Soph.	Corvallis
Hayes, Lucile.....	H. E.	Sr.	Portland
Hayslip, Earl.....	For.	Fr.	Vancouver, Wash.
Hazeltine, Caryl.....	L. E.	Soph.	Oakland, Calif.
Head, Cecille.....	H. E.	Soph.	Waldport
Heath, Charles Webster.....	Agri.	Spec.	Sioux Falls, N. D.
Heath, Howard Wells.....	Min.	Soph.	Tacoma, Wash.
Heidenreich, Heinrich.....	I. A.	Spec.	La Grande
Heider, Lorena Mary.....	H. E.	Fr.	Sheridan
Heiss, William Van Camp.....	Agri.	Fr.	Pasadena, Calif.
Henderson, Charles Albert.....	Agri.	Sr.	Gardiner
Henderson, Kate Leslie.....	Opt.		Lebanon
Henderson, William Wright.....	Agri.	Jr.	Eureka, Calif.
Hendricks, Mary Elizabeth.....	Opt.		Fossil
Hermann, Ursula Marie.....	H. E.	Voc.	Aberdeen, Wash.
Hesse, Lloyd Bryan.....	Agri.	Spec.	Bandon
Hewes, Cora.....	H. E.	Sr.	Albany

Name.	Course.	Rank.	Home Address.
Heywood, Victor.....	Agri.	Spec.	Portland
Hiestand, Clynton Harry.....	Phar.	S. Yr.	Corvallis
Hiestand, Zula	Com.	Spec.	Corvallis
Hilliari, Agatha Amelia.....	H. E.	Spec.	London, England
Hilton, Harold Henry.....	Agri.	Spec.	Portland
Hodgson, Marion.....	H. E.	Soph.	Ashland
Hoerlein, Paul Frank.....	Agri.	Spec.	Hood River
Hoerner, Godfrey Richard.....	Agri.	Sr.	Seattle, Wash.
Hoffard, Albert.....	Agri.	Voc.	Modum, Norway
Hofer, Paul Ballou.....	Agri.	Spec.	Pasadena, Calif.
Hoflich, Neva Leona.....	H. E.	Sr.	Albany
Holden, Jesse Lonson.....	M. E.	Fr.	Portland
Holgate, Mrs. L. C.....	Opt.		Corvallis
Holker, Booth.....	Agri.	Fr.	Toston, Mont.
Holland, Wellington Payton.....	Phar.	Fr.	McEwin
Hollenberg, Leo.....	Agri.	Jr.	Corvallis
Hollingsworth, Gertrude.....	H. E.	Sr.	Newberg
Holloway, Frances Mary.....	H. E.	Spec.	Brownsville
Holloway, William.....	Agri.	Spec.	Brownsville
Holmes, Frederick Aram.....	L. E.	Sr.	Enterprise
Hooper, John Amos.....	E. E.	Jr.	Corvallis
Hoover, Fenton Whitman.....	C. E.	Jr.	Los Angeles, Calif.
Hopkins, Horace.....	Agri.	Fr.	Corvallis
Hopper, Richard Homer.....	Agri.	Voc.	Payette, Idaho
Horner, Clyde.....	Phar.	F. Yr.	The Dalles
Horning, Helen Mabel.....	H. E.	Sr.	Corvallis
Hoskins, John Verne.....	M. A.	S. Yr.	Donald
Hoskins, Walter Scott.....	Com.	S. Yr.	Donald
Houck, Agnes Catherine.....	H. E.	Fr.	Portland
Houck, Roy Lester.....	E. E.	Jr.	Dallas
Houliston, Geoge McLean.....	Agri.	Sr.	East Aurora, N. Y.
Howard, Clement.....	Com.	Fr.	Stanfield
Howard, Dale.....	Agri.	Fr.	Astoria
Howell, Herbert.....	Agri.	Sr.	Portland
Howells, Katherine Marie.....	H. E.	Soph.	Medford
Howey, Iva May.....	H. E.	Jr.	Coquille
Howitt, Elizabeth.....	H. E.	Sr.	Gresham
Hubbard, Chauncey.....	Agri.	Sr.	Monroe
Hubbard, Clyde Wesley.....	Phar.	F. Yr.	Weiser, Idaho
Hubbard, Earl.....	Agri.	Fr.	Medford
Hubbard, Verda.....	H. E.	Fr.	Rickreall
Hudelson, Allen.....	Agri.	Voc.	Berger, Idaho
Hudson, Emil Paul.....	Agri.	Fr.	Milwaukie
Hudson, Jacob Ray.....	M. A.	Spec.	Milton
Huffaker, Wilford.....	Agri.	Soph.	Idaho Falls, Idaho
Hughes, Bethany Marie.....	H. E.	Voc.	Springfield
Hulbert, Fred Henry.....	Com.	Soph.	Aberdeen, Wash.
Hult, Gustaf Wilhelm.....	For.	Sr.	Corvallis

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Name.	Course.	Rank.	Home Address.
Humphrey, Esther Cynthia.....	H. E.	Jr.	Portland
Hung, Tung Ming.....	Agri.	Fr.	Amoy, China
Hunt, Echo Clair.....	Phar.	Spec.	Salem
Hunter, Albert Greenwood.....	Agri.	Spec.	American Fork, Utah
Hunter, Dean.....	Agri.	Fr.	Portland
Hunter, William Gilbert.....	Agri.	Fr.	Island City
Huntington, James.....	Agri.	Fr.	Yoncalla
Hurley, Alton.....	Agri.	Jr.	Seattle, Wash.
Husbands, Esther Elizabeth.....	H. E.	Soph.	Hood River
Husbands, Myrtle Blakley.....	Com.	Fr.	Hood River
Huston, Helen.....	Opt.		Corvallis
Hutchings, Earl Albert.....	Min.	Fr.	Brownsville
Hyams, Leo Klein.....	M. E.	Jr.	Portland
Ide, Fred Stitzel.....	Com.	F. Yr.	Colville, Wash.
Imrie, Lillian Mildred.....	H. E.	Jr.	Melrose
Ingalls, Darwin Albert.....	E. E.	Fr.	Grants Pass
Ingham, DeEtta.....	Com.	Jr.	Portland
Inman, Wilbur Joseph.....	Com.	Spec.	Ft. Collins, Colo.
Irvine, Ward Avery.....	Com.	Fr.	Portland
Irving, Ralph Edison.....	Agri.	Fr.	Harney City
Jackson, Della Minerva.....	H. E.	Sr.	Lorane
Jackson, Eva Inez.....	H. E.	Sr.	Portland
Jackson, Laura Luella.....	H. E.	Soph.	Lorane
Jacoby, Carl Charles.....	L. E.	Jr.	Toledo, Wash.
Jacoby, Fred.....	Agri.	Soph.	Toledo, Wash.
Jaeger, Harry Dunsmire.....	Agri.	Fr.	Portland
James, Samuel Clifford.....	Agri.	Voc.	Rochester, Wash.
Janes, Marjorie.....	H. E.	Jr.	Portland
Jaquith, Roy.....	Agri.	Fr.	Laurel
Jeffers, Fred Marion.....	Agri.	Voc.	Portland
Jenkins, Merle Truman.....	Agri.	Sr.	Portland
Jernstedt, Maurice.....	Agri.	Jr.	Carlton
Jessup, George Leroy.....	M. A.	S. Yr.	Marion
Jetley, Arthur Christ Lee.....	Hi. E.	Soph.	Narrows
Jewel, Herbert.....	Com.	Spec.	Portland
Jewell, Leonard Dwight.....	Agri.	Fr.	Grants Pass
John, Morris.....	Com.	Sr.	Corvallis
Johns, Miles Shirk.....	Agri.	Sr.	Bellingham, Wash.
Johnson, Clarence Benjamin.....	Agri.	Soph.	Hermiston
Johnson, Carl Stewart.....	Agri.	Jr.	Portland
Johnson, Chris Edward.....	Phar.	Soph.	North Powder
Johnson, Clifford.....	Agri.	Voc.	Boise, Idaho
Johnson, Darrel.....	Com.	Soph.	Corvallis
Johnson, Franklyn Whitcomb.....	E. E.	Soph.	Portland
Johnson, Gus Gordon.....	Phar.	Fr.	Quincy, Wash.
Johnson, Jennie Evelyn.....	H. E.	Spec.	Portland
Johnson, John Iver.....	Agri.	Fr.	Winlock, Wash.
Johnson, Lillian.....	H. E.	Jr.	Corvallis

OREGON AGRICULTURAL COLLEGE

Name.	Course.	Rank.	Home Address.
Johnson, Louise Merle	Com.	Jr.	Portland
Johnson, Owen	Agri.	Jr.	Quincy, Wash.
Johnson, Willard	For.	Soph.	Corvallis
Johnston, Jennie Bell.....	H. E.	Fr.	Klamath Falls
Johnston, Perry Nolan	Agri.	Sr.	Moro
Johnston, William Waters	Agri.	Jr.	Corvallis
Jonasen, Olaf Robert.....	For.	Sr.	Rock Island, Ill.
Jones, Edward Delta.....	M. E.	Sr.	Jefferson
Jones, Leon Kilby	Agri.	Jr.	Corvallis
Jones, Ronald Ewart	M. E.	Soph.	Brooks
Jordan, Calvin Arthur	C. E.	Sr.	Pendleton
Jory, Elmo Clayton	Phar.	Spec.	Salem
Kadderly, Wallace LaDue.....	Agri.	Jr.	Portland
Kain, Corland, Edward.....	E. E.	Soph.	Portland
Kabus, Minnie	H. E.	Sr.	Chehalis, Wash.
Kan, Frank	Agri.	Sr.	Nom Tong, China
Kane, Gardner Lewis	Agri.	Fr.	Gardena, Calif.
Kathan, Albert	Phar.	Fr.	Syracuse, N. W.
Kathan, George Lewis.....	Agri.	Sr.	Syracuse, N. Y.
Keatley, Eva Florence.....	H. E.	Sr.	Castlerock, Wash.
Keckritz, Anton Rudolph.....	M. E.	Fr.	Union
Keen, William Henry Harrison.....	Hi. E.	Fr.	Portland
Keil, Carl Herman.....	E. E.	Soph.	Cosmopolis, Wash.
Keller, Eugene John.....	Com.	S. Yr.	Grays River, Wash.
Kelley, Earl.....	M. A.	F. Yr.	Corvallis
Kellogg, Ralph Lester.....	Min.	Fr.	Portland
Kelly, Ruth.....	H. E.	Soph.	Portland
Kelsay, Lewis Lanas.....	Min.	Fr.	Fossil
Kennedy, Ruth.....	H. E.	Fr.	Corvallis
Kenny, Dora Lotella Agnes.....	H. E.	Fr.	Portland
Kent, Elva Corrina.....	Phar.	Spec.	Drain
Kenton, Ralph Mills.....	M. E.	Jr.	Albany
Kephart, Samuel.....	E. E.	Sr.	San Francisco, Calif.
Keppinger, Verna Mildred.....	H. E.	Fr.	Gervais
Ketchum, Beth.....	H. E.	Jr.	Independence
Ketchum, Jean.....	H. E.	Sr.	Independence
Kiddle, Lyle Blair.....	Com.	Soph.	Island City
Kimzey, Robert.....	Com.	Fr.	Corvallis
Kinderman, William.....	E. E.	Sr.	Kings Valley
King, Benjamin.....	I. E.	Fr.	Cottage Grove
King, Charles Allen.....	E. E.	Sr.	Ashland
King, Mrs. Lucile.....	I. E.	Fr.	Bandon
King, Philip Sheridan.....	Agri.	Jr.	Portland
King, Rudolph Jack.....	Agri.	Spec.	Portland
Kingsley, Earl Jinas.....	Com.	Sr.	Corvallis
Kingsley, Everette.....	H. E.	Fr.	Corvallis
Kinnison, Grace.....	H. E.	Jr.	San Francisco, Calif.
Kirkland, Clarence Gearld.....	M. A.	F. Yr.	Corvallis

Name.	Course.	Rank.	Home Address.
Kirkwood, Emile Glenn	M. E.	Fr.	Amity
Kirtley, Naomi Edna	H. E.	Sr.	La Grande
Knight, Florence Lillian	H. E.	Sr.	San Luis Obispo, Calif.
Knowles, Inez	H. E.	Soph.	La Grande
Knox, Leland Jay	Com.	Sr.	Fossil
Kocken, Walter Joseph	Agri.	Soph.	Cleveland
Koenig, Walter Jacob	Agri.	Sr.	Rock Island, Ill.
Kohlhagen, Florence Louise	Opt.		Roseburg
Kohli, Chet Ram	Agri.	Fr.	Jammu, India
Kooreman, Milton Abraham	M. E.	Fr.	Salem
Kotan, Mary	Com.	Voc.	Crabtree
Kraft, Harry William	Com.	Fr.	National City, Calif.
Krause, Cris Milton	Agri.	Fr.	Long Beach, Calif.
Kreitle, Margariete	H. E.	Fr.	Dallas
Kreps, Rhoda Jane	Opt.		Laurel, Wash.
Krueger, Clarence William	E. E.	Soph.	Corvallis
Kruger, Herbert William	Min.	Jr.	Portland
Kubin, Jennie May	H. E.	Fr.	Salem
Kuks, Anna May	H. E.	Jr.	Milwaukie
Kurtz, Martin	Com.	Soph.	Corvallis
Kyle, Kittie Gertrude	H. E.	Soph.	Corvallis
Lafky, Herman Ernest	Agri.	Soph.	La Grande
Lagus, Sigurd Wilhelm	Min.	Fr.	Astoria
Laing, Mabel Elsie	H. E.	Spec.	Boise, Idaho
Laird, Freda	H. E.	Spec.	Creswell
Laird, Ralph	Agri.	Sr.	Creswell
Lamb, Howard Milton	Agri.	Sr.	Fossil
Lamoureux, Louis Andre	Agri.	Jr.	Rosebank, N. Y.
Lamoureux, Thomas Liggett	Agri.	Sr.	Rosebank, N. Y.
Lamoureux, Beatrice Josephine	Opt.		Camas, Wash.
Lamson, Maude Eliza	H. E.	Soph.	Cottage Grove
Lance, John Harlan	Com.	Fr.	Corvallis
Lance, Neely Samuel	Agri.	Jr.	Corvallis
Lane, Bernice	H. E.	Soph.	Corvallis
Lane, Dorothy Elizabeth	H. E.	Jr.	Los Angeles, Calif.
Lane, Vivian Maude	H. E.	Sr.	Harrisburg
Lankenau, Walter	For.	Soph.	New York City, N. Y.
Lankins, Hazel Clair	H. E.	Soph.	Hubbard
Lansdale, Zane Arthur	C. E.	Sr.	Weston
Lantz, Harvey Lee		Sr.	Cove
Larsen, James Carl	E. E.	Fr.	Suver
Larson, Clarence Clifford	Com.	Soph.	Payette, Idaho
Larson, Melvin Laverne	For.	Fr.	La Grande
Larson, Raymond Gilbert	Agri.	Spec.	Fairfield, Iowa
Lascar, Adhar Chandra	E. E.	Jr.	Bengal, India
Lasswell, Avery Lloyd	Com.	Sr.	Portland
Laythe, Leo	Agri.	Sr.	Harriman
Leavell, Leonard	Hi. E.	Fr.	Timber Valley, Wash.

Name.	Course.	Rank.	Home Address.
Lee, Bernard.....	Agri.	Spec.	Meridian, Idaho
Lee, George Olin.....	C. E.	Sr.	Maltby, Wash.
Leech, Archer Olin.....	M. E.	Soph.	Albany
Legg, Gladys Loretta.....	H. E.	Jr.	Portland
Leibner, Emil Carl.....	Agri.	Spec.	Albany
Leisy, Harvey Arthur.....	M. A.	T. Yr.	Salem
Leisy, Linda Emelia.....	H. E.	Voc.	Salem
Leland, Randolph Elliott.....	Agri.	Soph.	Los Angeles, Calif.
Lemieux, Louis Charles.....	M. A.	S. Yr.	Wrangell, Alaska
Letellier, George Henri.....	Com.	Soph.	Mill City
Leonard, Charlie Lloyd.....	M. E.	Fr.	Scappoose
Le Peau, Nathaniel.....	Opt.		Portland
Levage, Harry Vernon.....	Agri.	Jr.	Florence
Lewis, Paul.....	Agri.	Soph.	Rex
Likins, Joseph Irving.....	M. E.	Fr.	Portland
Lindeman, Harold Henry.....	Agri.	Fr.	Alhambra, Calif.
Lindeman, Laird.....	Agri.	Spec.	Corvallis
Lindquist, Fric Arthur.....	M. A.	S. Yr.	New Hazelton, B. C.
Lindsay, Alexander Lewis.....	Agri.	Sr.	Corvallis
Lindsay, Annie McDonald.....	H. E.	Soph.	Corvallis
Lines, Ruth Joy.....	Opt.		Albany
Linn, Ralph Emerson.....	Agri.	Fr.	Meridan, Idaho
Linville, Myrtle Harriet.....	H. E.	Fr.	Astoria
Littlar, Florence Elizabeth.....	H. E.	Soph.	Forest Grove
Little, Hubert William.....	Com.	Spec.	McMinnville
Livingston, Jr., Will Harvey.....	Agri.	Spec.	Greenfield, Calif.
Locey, Percy Philip.....	Com.	Fr.	Weiser, Idaho
Locher, Leonard Joseph.....	M. E.	Sr.	Burns
Loftus, Agnes Beth.....	Com.	Spec.	Minneapolis, Minn.
Logan, Anna Louise.....	Opt.		Portland
Logan, Arthur Evan.....	Com.	Sr.	Escandido, Calif.
Logan, Helen Elizabeth.....	Opt.		Escandido, Calif.
Logan, Madalene.....	H. E.	Fr.	McMinnville
Long, Howard Allen.....	Com.	Jr.	Portland
Long, Yick.....	Com.	Sr.	Canton, China
Loo, Nai Fatt.....	Agri.	Fr.	Victoria, B. C.
Looff, Hans Walter.....	For.	Sr.	Oak Harbor, Wash.
Loop, Charles Roy.....	Agri.	Fr.	McMinnville
Loop, Rosa.....	Com.	F. Yr.	McMinnville
Lorence, Jennings Bryan.....	M. E.	Soph.	Monmouth
Lorence, Ruby Ann.....	Opt.		Monmouth
Loughary, Elithe.....	H. E.	Soph.	Monmouth
Loughary, Ivan Hill.....	Agri.	Sr.	Monmouth
Loughrey, Ettley Elsworth.....	Min.	Fr.	Payette, Idaho
Low, Charles.....	Min.	Fr.	Salem
Lowe, Thomas Julian.....	Agri.	Soph.	Nyssa
Lowell, Arthur Leslie.....	Agri.	Spec.	Wasco
Lowell Carlton Edward.....	Agri.	Voc.	Corvallis

Name.	Course.	Rank.	Home Address.
Lowry, Ralph William.....	Agri.	Jr.	Corvallis
Lucas, Elva Alice.....	Opt.		Dallas
Lucas, William.....	M. E.	Fr.	Parkplace
Luebke, William.....	Com.	Fr.	Toutle, Wash.
Luebke, James.....	M. E.	Fr.	Toutle, Wash.
Lundeen, Arthur.....	L. E.	Sr.	Rock Island, Ill.
Lundgren, Alice.....	H. E.	Fr.	Puyallup, Wash.
Lundgren, Carl Oliver.....	Agri.	Soph.	Puyallup, Wash.
Luxton, William Lee.....	Com.	Jr.	Idaho Falls, Idaho
Lyman, Lloyd.....	For.	Fr.	Cleveland, Ohio
McBride, Lola Winifred.....	H. E.	Fr.	Corvallis
McCaffrey, Lawrence Martin.....	L. E.	Soph.	Spring Valley, Ohio
McCain, Ernest Vivian.....	E. E.	Fr.	Jordan Valley
McClain, Arthur.....	Com.	Fr.	Salem
McClellan, Thomas Richard.....	Agri.	Sr.	West Stayton
McClelland, Ben Glascock.....	Agri.	Fr.	Salem
McCollum, Charles Adelbert.....	L. E.	Soph.	Salinas, Calif.
McCollum, John Edgar.....	L. E.	Jr.	Salinas, Calif.
McCormick, Anna Elizabeth.....	H. E.	Sr.	Lebanon
McCormick, Harl Craig.....	I. A.	Soph.	Corvallis
McCornack, Alice.....	H. E.	Soph.	Marcola
McCornack, Eugene.....	Agri.	Spec.	Klamath Falls
McCoy, Arthur Wallace.....	Agri.	Sr.	Kansas City, Mo.
McCoy, John.....	Agri.	Fr.	Glendale, Calif.
McCrae, George Clifford.....	Agri.	Spec.	Corvallis
McCullough, Addie.....	H. E.	Fr.	Carlton
McElhose, Mrs. R. E.....	Opt.		Corvallis
McEntire, Eunice Irene.....	H. E.	Fr.	Weiser, Idaho
McEwen, Daniel Franklin.....	Agri.	Soph.	Portland
McGeorge, William.....	C. E.	Jr.	Eugene
McGinnis, Alice.....	H. E.	Spec.	Corvallis
McGinnis, Iva Belle.....	Opt.		Corvallis
McHenry, Bertha.....	H. E.	Jr.	Corvallis
McHenry, Muriel Esther.....	Com.	Jr.	Corvallis
McIntyre, Frank.....	Com.	Spec.	Hartford Conn.
McKay, James Douglas.....	Agri.	Soph.	Portland
McKee, Stuart.....	Agri.	Fr.	Selah, Wash.
McKim, Stanley Horton.....	Agri.	Soph.	Oakland, Calif.
McKissick, Joe Carson.....	Agri.	Fr.	Wallace, Idaho
McMaster, Cedric Stuart.....	Agri.	Soph.	Corvallis
McMindes, Elvin Winfield.....	Agri.	Soph.	Lorane
McMinn, Bryan Towne.....	M. E.	Soph.	Corvallis
McMinn, Grace Blanche.....	Opt.		Corvallis
McMinn, Ray Ben.....	M. E.	Sr.	Portland
McNeil, Alexander.....	Agri.	Fr.	Hauston, Scotland
McPherson, Daisy Augusta.....	H. E.	Sr.	Pendleton
McRay, Lela LaMiza.....	Com.	Spec.	Sherwood
McRay, Murry Marvin.....	Agri	Spec.	Sherwood

Name.	Course.	Rank.	Home Address.
McReavy, Cecila Cameron.....	H. E.	Spec.	Tacoma, Wash.
McVey, Clarence LeRoy.....	For.	S. C.	Corvallis
McVicar, Ward.....	Agri.	Soph.	Los Angeles, Calif.
Maag, Esther Verna.....	H. E.	Fr.	Salem
MacCrow, Hughretta Naomi.....	H. E.	Fr.	Goldendale, Wash.
MacDonald, Helen.....	H. E.	Jr.	Corvallis
Madsen, Alvin Hjalmar.....	Agri.	Voc.	Silverton
Magnuson, Hazel Johanna.....	H. E.	Fr.	Everett, Wash.
Mahon, James Lake.....	M. E.	Fr.	Hillsboro
Mainwaring, William Bernard.....	Com.	Fr.	Newberg
Malone, Earl Nicholas.....	Agri.	Fr.	Castle Rock, Wash.
Mamlet, Alfred Moses.....	Agri.	Soph.	Passaic, N. J.
Manary, Gertrude Marguerite.....	H. E.	Soph.	Portland
Manock, Nathan Edwin.....	Phar.	Sr.	Corvallis
Manuel, Mildred Marian.....	H. E.	Sr.	Oakland, Calif.
Margson, Mrs. Margaret.....	Com.	Voc.	Salem
Mars, Lewis Donald.....	Min.	Spec.	Gervais
Marshall, Julian Stephens.....	Min.	Fr.	Corvallis
Martin, Elsie Pauline.....	H. E.	Fr.	McMinnville
Martin, Glen.....	Agri.	Fr.	McMinnville
Martin, Porter Wilson.....	M. E.	Jr.	Corvallis
Martyn, Wallace Howell.....	Com.	Spec.	Eugene
Mason, Ben.....	M. E.	Soph.	Puyallup, Wash.
Mason, Earl George.....	For.	Fr.	Salem
Mason, Howard.....	Agri.	Fr.	Pasadena, Calif.
Mason, Walter Harold.....	I. A.	Sr.	Ione
Mateer, Ruth Marion.....	H. E.	Sr.	Nampa, Idaho
Mather, Horace Spencer.....	Agri.	Soph.	Geneva, Wash.
Matson, Lloyd.....	M. E.	Fr.	Vancouver, Wash.
Maxey, Mrs. Elnora.....	Opt.		Corvallis
Maxwell, Jane Irene.....	H. E.	Voc.	Eugene
May, Lula Litten.....	H. E.	Soph.	Monkland
Mayhew, Spencer Neff.....	Agri.	Sr.	North Bend
Mayne, Harry McDonald.....	Agri.	Soph.	Salt Lake City, Utah
Meacham, Leta.....	H. E.	Soph.	Weiser, Idaho
Meek, Margaret Rhoda.....	H. E.	Jr.	Oakland, Calif.
Meier, Albert Otto.....	Agri.	Soph.	Hillsdale
Meier, Edwin.....	Hi. E.	Fr.	Mist
Meloy, George Everett.....	M. E.	Fr.	Corvallis
Mendenhall, Fred.....	Phar.	F. Yr.	Corvallis
Mentzer, Leland.....	I. A.	Fr.	Pendleton
Mercer, Helen Bernetta.....	H. E.	Jr.	Salem
Mesher, Sophie.....	H. E.	Soph.	Portland
Mettie, Zena.....	H. E.	Spec.	Ukiah
Metzger, Floyd.....	Com.	Jr.	Gresham
Metzler, Ivan.....	Com.	Soph.	Corvallis
Meyers, Cornelius William.....	Min.	Jr.	Portland
Meyers, Cyril Lawrence.....	Min.	Jr.	Portland

UNDERGRADUATE STUDENTS

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Name.	Course.	Rank.	Home Address.
Meyers, Donald	Com.	Sr.	Salem
Michelbrook, Roy	M. E.	Sr.	McMinnville
Mickel, George Lawrence	Phar.	S. Yr.	Corvallis
Middlekauff, Donald	Agri.	Sr.	Lewiston, Idaho
Middlekauff, Harold	Agri.	Sr.	Lewiston, Idaho
Middlekauff, Mark Humbert	Agri.	Sr.	Corvallis
Mifune, Shizno	Hi. E.	Fr.	Portland
Miller, David Baker	Agri.	Spec.	Denver, Colo.
Miller, Edwin Harvey	Min.	Jr.	Lexington
Miller, Eula Ellen	H. E.	Fr.	Corvallis
Miller, Eva	H. E.	Sr.	Fillmore, Ill.
Miller, Gail James	Agri.	Spec.	Forest Grove
Miller, Grace	H. E.	Fr.	Corvallis
Miller, Helen Lavena	H. E.	Jr.	Corvallis
Miller, Kenneth Earl	Min.	Fr.	Creswell
Miller, Leo Waldemer	E. E.	Soph.	Portland
Miller, Marjorie Modelle	Opt.		Union
Miller, William Franklin	Com.	Spec.	Newberg
Millikin, Damon Edmund	Agri.	Sr.	Ontario
Miltimore, Anne Laurel	Com.	Spec.	Corvallis
Minsinger, David William	Com.	Sr.	Portland
Mintonye, Clare	Agri.	Voc.	Coquille
Mirick, Laurence Payson	Agri.	Voc.	Creswell
Mitchell, Lloyd Paul	Agri.	Soph.	Boise, Idaho
Mix, Ira Delbert	Com.	Jr.	Independence
Moberg, James Dalgety	E. E.	Soph.	Astoria
Moist, Charles	Phar.	F. Yr.	Lebanon
Moloney, James Lovering	Com.	F. Yr.	Marshfield
Monger, Walter Victor	E. E.	Sr.	Parkplace
Moody, Charlotte Elizabeth	H. E.	Soph.	Carlsbad, Calif.
Moody, Clifford Heegler	Com.	F. Yr.	Fairbanks, Alaska
Moore, Alice	Agri.	Spec.	Portland
Moore, Herman Harvey	Agri.	Voc.	Bend
Moore, Leland Bernard	Agri.	Jr.	Gresham
Moore, Myra Lucille	H. E.	Soph.	Corvallis
Moore, Merle	M. E.	Sr.	Corvallis
Moore, Ralston Temple	Phar.	Spec.	Oak Grove
Moore, Willetta	H. E.	Sr.	Eugene
Morgan, Beulah Inez	H. E.	Jr.	Corvallis
Morgan, Ralph Lester	Agri.	Jr.	Corvallis
Morgan, Victor	Agri.	Sr.	Winona, Minn.
Morgan, Walter John	Agri.	Jr.	Portland
Morian, Harold Louis	Min.	Fr.	Portland
Mornhinweg, Charles	For.	Soph.	Halsey
Morris, Blanche	H. E.	Jr.	Tennant, Iowa
Morris, David Clyde	Min.	Jr.	Edmond, Okla.
Morris, Homer	M. E.	Soph.	Yamhill
Morris, Mrs. Winifred Dunlap	Opt.		Corvallis

Name.	Course.	Rank.	Home Address.
Morris, Ray August.....	Agri.	Fr.	Oregon City
Morrison, Eugene Franklin.....	Min.	Soph.	Williams
Morrison, Ruth.....	H. E.	Sr.	Hood River
Morrow, William Harold	Agri.	Fr.	Portland
Morse, Mildred Phoebe.....	H. E.	Soph.	West LaFayette, Ind.
Morse, Wilmetta Emily.....	H. E.	Sr.	West LaFayette, Ind.
Morton, Ruth.....	H. E.	Soph.	White Salmon, Wash.
Mosby, David Clayborn.....	Agri.	Jr.	Corvallis
Moss, Lloyd Arthur.....	Agri.	Fr.	Hood River
Motz, Fred Allen	Agri.	Jr.	Rock Island, Ill.
Moulton, Arthur Samuel.....	Agri.	Fr.	Portland
Mudge, Frank.....	Com.	Spec.	Knappa
Mulkey, Oren.....	E. E.	Jr.	Myrtle Creek
Muller, Ruth Margaret.....	H. E.	Fr.	Eugene
Munford, Ruby Elizabeth.....	H. E.	Sr.	Senecaville, Ohio
Munson, Robert Bliss.....	M. A.	F. Yr.	Oakland, Calif.
Murneek, Andrew Edward.....	Agri.	Jr.	Talsen, Russia
Murphy, Clara May.....	H. E.	Jr.	Eden
Murphy, Frank Thomas.....	Agri.	Jr.	Alhambra, Calif.
Myers, Clarence William.....	Agri.	Jr.	Moneta, Calif.
Myers, Francis Parker.....	M. E.	Soph.	Corvallis
Myers, Stanley Howard.....	E. E.	Soph.	Corvallis
Naderman, George Vincent.....	M. E.	Fr.	Turner
Nash, Jack Walker.....	C. E.	Sr.	Albany
Neal, Martena Ruth.....	H. E.	Soph.	Long Beach, Calif.
Neale, Aubrey Richard.....	Agri.	Sr.	Corvallis
Neill, Alletah Marcella.....	Opt.		Chippewa Falls, Wis.
Nelson, Willard Young.....	C. E.	Sr.	Lafayette
Neovius, Carl Fredrick.....	Com.	Fr.	Helsingford, Finland
Nesbitt, Clarence Scott.....	Com.	Soph.	New Plymouth, Idaho
Nestelle, Fred William.....	Agri.	Soph.	Corvallis
Neuhaus, Karl Frank.....	Agri.	Fr.	Ferndale, Calif.
Nevius, John.....	Agri.	Fr.	Long Beach, Calif.
Newell, Joseph Webster.....	Agri.	Jr.	Portland
Newins, Geraldine.....	H. E.	Sr.	Corvallis
Newman, Erbine.....	Agri.	Soph.	Scott Mills
Newman, Meier.....	Com.	Spec.	Portland
Newmeyer, Ruth.....	H. E.	Sr.	Salem
Newton, Bessie Fay.....	H. E.	Spec.	Corvallis
Niblin, Amy Christine.....	H. E.	Soph.	Portland
Niblin, Ruth Calvina.....	H. E.	Fr.	Portland
Nichols, Jr., Benjamin Hodge.....	M. E.	Fr.	Glendale, Calif.
Nichols, Mrs. Eleanor Bailey.....	H. E.	Spec.	Corvallis
Nichols Floyd Myron.....	M. A.	Spec.	Corvallis
Nichols, Fred Herbert.....	Agri.	Soph.	Glendale, Calif.
Nichols, Rudolph.....	Agri.	Soph.	Corvallis
Nichols, Tressa Elizabeth.....	Opt.		Corvallis
Nielson, Sidney Maurice.....	Agri.	Fr.	Ferndale, Calif.

UNDERGRADUATE STUDENTS

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Name.	Course.	Rank.	Home Address.
Nikka, Albert.....	Phar.	Fr.	Astoria
Nisley, Barbara Hoffman.....	H. E.	Fr.	Portland
Nolan, Victor Edward.....	Com.	Jr.	Corvallis
Noles, Carl.....	Com.	Jr.	Dundee, Texas
Nordhoff, Franklin Whitall.....	Agri.	Spec.	National City, Calif.
Norman, Ruth.....	Com.	Jr.	Milton
Norton, Cecil Conrad.....	Agri.	Fr.	Raymond, Calif.
Norton, Edmund Carlyle.....	Com.	Spec.	Corvallis
Norton, Harry Stewart.....	Com.	Fr.	Coquille
Norton, Lola Catherine.....	H. E.	Jr.	Vacaville, Calif.
Norton, Mabel.....	H. E.	Sr.	Vacaville, Calif.
Norton, Walter Bert.....	Agri.	Jr.	Vacaville, Calif.
Oakes, Mary Agnes.....	H. E.	Sr.	Grants Pass
O'Harra, Herman Edward.....	Agri.	Soph.	Weston
Oliver, Alfred Weaver.....	Agri.	Soph.	Salem
Oliver, Burt Leroy.....	Com.	F. Yr.	Burns
Oliver, Fred Lloyd.....	Agri.	Fr.	Monroe, Wash.
Olsen, Edward Carl.....	Com.	F. Yr.	Portland
Olsen, Leander.....	For.	Fr.	Moroni, Utah
O'Neill, Larkin Alucius.....	Agri.	Fr.	Mountain Home, Idaho
O'Neil, William James.....	L. E.	Jr.	Chippewa Falls, Wis.
Ono, Robert Tokiro.....	Agri.	Sr.	Nuda, Echigo, Japan
Orem, Elsie Hazel.....	H. E.	Sr.	Klamath Falls
Orr, Victor.....	Agri.	Soph.	Corvallis
Osborne, Gifford Lawson.....	M. A.	S. Yr.	Aurora
Osburn, Orren Edgar.....	E. E.	Soph.	The Dalles
Ostrander, Aubrey.....	Agri.	Soph.	Portland
Otis, Ralph Grey.....	Agri.	Jr.	Newberg
Overholser, Leroy Leighton.....	Com.	Sr.	Jefferson
Owens, Jacob Henry.....	Agri.	Fr.	Raymond, Wash.
Page, Charles Culver.....	Agri.	Spec.	Crookston, Minn.
Page, Chester Leroy.....	E. E.	Fr.	Whitehall, Mont.
Page, Harold.....	Agri.	Fr.	Whitehall, Mont.
Paine, Charles Levi.....	Agri.	Fr.	Caldwell, Idaho
Paine, Edward Allen.....	E. E.	Jr.	Portland
Palmer, Bertie Cecil.....	Agri.	Fr.	Jordan Valley
Palmer, Charles Luther.....	Phar.	F. Yr.	Baker
Palmer, Lowell Elbert.....	M. A.	T. Yr.	Jordan Valley
Palmer, Ralph Russell.....	Phar.	Sr.	Grand Junction, Colo.
Palmer, Walter.....	Phar.	Soph.	Grand Junction, Colo.
Palmer, Winona Marion.....	H. E.	Voc.	Silverton
Pardridge, John.....	Agri.	Spec.	Pasadena, Calif.
Parker, Lewis Griffin.....	Agri.	Fr.	Needles, Calif.
Paroni, Romeo.....	Agri.	Fr.	Berkeley, Calif.
Parpala, Taimie Armas.....	Agri.	Sr.	Nasel, Wash.
Parr, Fern Gail.....	H. E.	Sr.	Woodburn
Parrish, Philip Hammon.....	Agri.	Jr.	Corvallis
Parrish, Robert.....	Agri.	Jr.	Corvallis

Name.	Course.	Rank.	Home Address.
Partin, Rae	H. E.	Soph.	Summer Lake
Passmore, Dorothy Ellen.....	H. E.	Sr.	Tualatin
Patterson, Margaret	H. E.	Soph.	Ashland
Patton, Harry Clifford.....	L. E.	Jr.	Macleay
Paull, James Gregory	Agri.	Soph.	Los Angeles, Calif.
Paulsen, Edward Meier	L. E.	Sr.	Portland
Payne, Merle Henry	For.	S. C.	Roseburg
Peabody, Natalie Bemus.....	Opt.		Castle Rock, Wash.
Pearcy, Harry Leland.....	Agri.	Sr.	Portland
Pearson, Roderic	C. E.	Sr.	Portland
Pease, Pauline Mary	H. E.	Sr.	Portland
Pechin, William	Com.	Jr.	Forest Grove
Pendergrass, James Elmo	Phar.	Spec.	Clovis, Calif.
Peterson, Inez	Com.	Fr.	Corvallis
Peterson, Ira	Agri.	Soph.	Corvallis
Peterson, Robert	Agri.	Fr.	Aumsville
Pfouts, George Ward.....	M. A.	F. Yr.	Monroe
Phetteplace, Edwin Erastus.....	Phar.	Soph.	The Dalles
Philippi, Albert Roy.....	Agri.	Spec.	Early
Philips, James Commons.....	Agri.	Spec.	Seattle, Wash.
Phillips, Columbus	Com.	F. Yr.	Corvallis
Phillips, Elijah Edward.....	Min.	Spec.	Salem
Phillips, Hazel Elsie.....	Opt.		Corvallis
Pierce, Loyd Byron.....	Agri.	Spec.	La Grande
Pietzker, Henry Fred.....	E. E.	Soph.	Portland
Pimm, Charles Jesse.....	E. E.	Jr.	Corvallis
Pinkney, Dunbar.....	Agri.	Jr.	Aberdeen, Wash.
Pine, William Douglas.....	Agri.	Soph.	Berkeley, Calif.
Pinkerton, Harry Bennett.....	Agri.	Soph.	Moro
Pinn, Frederick Edward.....	E. E.	Jr.	White Salmon, Wash.
Pitney, Mary Eleanor.....	H. E.	Soph.	Junction City
Plank, Esther	H. E.	Sr.	Woodburn
Platt, Dwight Gilbert.....	M. E.	Jr.	Idaho Falls, Idaho
Poling, Harold Wayne.....	Agri.	Fr.	Portland
Polson, Nellie Irene.....	H. E.	Soph.	Mt. Vernon
Poole, Roy Mabae.....	Min.	Fr.	Beaverton
Porter, Ercil Dale.....	E. E.	Soph.	McMinnville
Porter, Harry Baxter.....	M. E.	Sr.	Yoncalla
Porter, Ted John.....	Agri.	Soph.	Halsey
Post, Clara Olga.....	Com.	Jr.	Blachly
Post, Elmer Oren.....	Agri.	Jr.	Blachly
Potter, Genevieve.....	H. E.	Sr.	Salem
Powell, Charles Kelly.....	Agri.	Sr.	Fruitland, Idaho
Powell, Frank Braxton.....	Agri.	Sr.	Monmouth
Powell, Lydia	H. E.	Jr.	Monmouth
Powell, William Lester.....	Agri.	Soph.	Azusa, Calif.
Powers, Fred	I. A.	Jr.	Oakland
Prather, Marie Alma.....	Com.	Fr.	Corvallis

Name.	Course.	Rank.	Home Address.
Prather, Mildred Esther.....	H. E.	Fr.	Corvallis
Prentiss, Mrs. Sara Watt.....	H. E.	Jr.	Bay City
Preston, Edward Lincoln.....	Agri.	Fr.	Dallas
Prill, Alice.....	H. E.	Sr.	Chetek, Wis.
Prindle, Ray.....	E. E.	Jr.	Payette, Idaho
Prindle, Susan Esther.....	H. E.	Fr.	Fossil
Pritchard, Robert Arthur.....	I. A.	Fr.	Portland
Proebstel, John Elden.....	Agri.	Fr.	Big Pine, Calif.
Pryer, Clarence Edwin.....	Phar.	F. Yr.	Fortuna, Calif.
Purrington, Leland Lincoln.....	Agri.	Voc.	Sebastopol, Calif.
Putnam, Wyatt Huston.....	M. A.	F. Yr.	Fossil
Raab, Edith Belle.....	H. E.	Fr.	North Bend
Rackleff, David Edward.....	Phar.	F. Yr.	Florence
Radcliff, Edward Everett.....	Agri.	Fr.	Burbank, Calif.
Raddas, Gladys.....	Com.	S. Yr.	Corvallis
Rains, Opal Irene.....	H. E.	Fr.	West Linn
Ramsdell, George Vittz-James.....	Agri.	Soph.	Portland
Rand, Earl.....	Agri.	Jr.	Irrigon
Rawlings, Ellen Madeline.....	H. E.	Sr.	Albany
Ray, Howard.....	Agri.	Soph.	Roslyn, Wash.
Raymond, Thayer.....	H. E.	Fr.	Raymond, Wash.
Ream, Rebecca.....	H. E.	Spec.	Sioux City, Iowa
Rearden, Barton,.....	I. A.	Fr.	Corvallis
Rearden, Henry John.....	Com.	Fr.	Corvallis
Reber, Albert Roy.....	Agri.	Soph.	Kansas City, Kansas
Redmond, Agnes Theresa.....	H. E.	Soph.	Portland
Reed, Ada Jeanette.....	H. E.	Soph.	Portland
Reed, Frank Leland.....	For.	Fr.	Hemet, Calif.
Reese, Neilson Walker.....	Hi. E.	Soph.	Corvallis
Reeves, Edgar Allen.....	Agri.	Fr.	McMinnville
Regnell, Lloyd Clifford.....	L. E.	Fr.	Hood River
Reichart, Emanuel Henry.....	Agri.	Sr.	Corvallis
Reichart, Robert Ray.....	Com.	Jr.	Corvallis
Reid, Ralph.....	Min.	Fr.	Portland
Reitsma, Ray.....	Com.	F. Yr.	Portland
Renfro, Charles Harold.....	E. E.	Sr.	Eugene
Reynolds, Earl Childers.....	Agri.	Fr.	La Grande
Reynolds, Frederick William.....	E. E.	Fr.	Camas, Wash.
Reynolds, Hugh Milton.....	Agri.	Jr.	Pasadena, Calif.
Rhodes, Solomon Martin.....	Agri.	Fr.	Covington, Tenn.
Rice, Clarence De Puy.....	Agri.	Soph.	Redmond
Rice, James Leonard.....	Agri.	Voc.	Portland
Rice, Leaton Alanson.....	Min.	Soph.	Corvallis
Richards, Dale Everette.....	Agri.	Sr.	Kalispell, Mont.
Richards, Lorene.....	Com.	Jr.	Corvallis
Richey, Lester.....	For.	Fr.	Corvallis
Richman, Parnell.....	Agri.	Spec.	Sutherlin
Richter, Henry Carl.....	Agri.	Sr.	Salem

Name.	Course.	Rank.	Home Address.
Richter, Paul Eugene.....	Agri.	Fr.	Oak Grove
Ricketts, Ellsworth Gould.....	H. E.	Fr.	Portland
Riddle, Julius.....	E. E.	Fr.	Roseburg
Rigdon, Harriet.....	H. E.	Sr.	National City, Calif.
Riippa, Wainard.....	Min.	Jr.	Portland
Risley, Hayden Israel.....	M. E.	Fr.	Albany
Ritchie, Douglas William.....	Agri.	Soph.	Corvallis
Roberts, Clyde Stewart.....	For.	Spec.	Portland
Roberts, Jessamy Lillian.....	H. E.	Soph.	Portland
Roberts, Melvin Parker.....	Agri.	Spec.	Arcata, Calif.
Robertson, Catharine.....	H. E.	Fr.	Portland
Robins, Mabel Gertrude.....	H. E.	Spec.	Harriman
Robinson, Paul Winfield.....	Phar.	Spec.	Corvallis
Robson, Allan Edwin.....	M. E.	Sr.	Corvallis
Rock, John Fairbank.....	Agri.	Fr.	Santa Barbara, Calif.
Rock, John Herbert.....	Agri.	Spec.	Oretown
Rodgers, Gladys Belle.....	H. E.	Jr.	Gardena, Calif.
Rodgers, Hugh Graham.....	Agri.	Soph.	Cupertino, Calif.
Roehrig, Fredrick Austin.....	E. E.	Soph.	Pasadena, Calif.
Rogers, Mary Alice.....	H. E.	Soph.	Corvallis
Rogers, Wilbur Leslie.....	E. E.	Soph.	Corvallis
Rohde, George.....	Phar.	Jr.	Portland
Rohr, Frank Charles.....	M. E.	Sr.	Astoria
Romans, Squire Bernard.....	Agri.	Voc.	Danbury, Conn.
Romig, Frank Vernon.....	M. E.	Sr.	McCoy
Roper, William.....	Phar.	Spec.	Antelope
Roseman, Arthur Mills.....	Agri.	Fr.	Corvallis
Roseman, Charles Hammer.....	Agri.	Sr.	Corvallis
Roseman, Edward.....	Agri.	Sr.	Corvallis
Ross, Linden Ninde.....	Agri.	Voc.	Los Angeles, Calif.
Ross, Myrtle Vivian.....	H. E.	Spec.	Pendleton
Rowntree, Kenneth.....	Min.	Soph.	Hillsdale
Runyan, Wilbur Arthur.....	Hi. E.	Soph.	Portland
Rush, Benjamin.....	C. E.	Jr.	Elgin
Russell, Charles.....	Agri.	Fr.	Pendleton
Russell, Frank.....	L. E.	Jr.	Portland
Russell, John M.....	Agri.	Voc.	Portland
Russell, Ralph.....	Agri.	Spec.	La Grande
Ruthven, Arthur Rerford.....	Agri.	Voc.	Corvallis
Sahasrabudhe, Janardan Vishwanath.....	Agri.	Fr.	Nagpur, C. P. India
Samuelson, Carl Reinhold.....	M. A.	T. Yr.	Colton
Samuelson, Oliver Lorenzo.....	Agri.	Spec.	Brownsville
Sanders, Lewis Claude.....	I. A.	Jr.	Corvallis
Sanderson, Maysel Ellen.....	H. E.	Sr.	Klamath Falls
Sandon, Helen Beatrice.....	H. E.	Fr.	Corvallis
Sarpola, Alexander.....	For.	Fr.	Astoria
Sato, Juemon.....	Agri.	Sr.	Corvallis

Name.	Course.	Rank.	Home Address.
Satterlee, Guy Norman	Agri.	Spec.	Tidewater
Saunders, Towle Edward	Min.	Fr.	Portland
Sawyer, Doris	H. E.	Soph.	Salem
Sayer, Noble Gregory	H. E.	Spec.	Condon
Schmidt, Ernest Carl	Com.	S. Yr.	Corvallis
Schneider, Nicholas	Agri.	Voc.	Portland
Schooley, Paul	Agri.	Sr.	Santa Ana, Calif.
Schoth, Albert Joseph	Agri.	Soph.	Oregon City
Schott, Rena	H. E.	Soph.	Salem
Schreiber, Martin Andrew	Agri.	Sr.	McMinnville
Schrepel, Oliver Henry	Agri.	Sr.	Corvallis
Schroeder, Bertha Amelia	H. E.	Sr.	Corvallis
Schroeder, Carl Alfred	Agri.	Fr.	Portland
Schubert, Ben	L. E.	Sr.	Silverton
Schultz, Elsie Elizabeth	H. E.	Sr.	Gresham
Schuster, Earl John	Phar.	Sr.	Corvallis
Schwarz, George Marion	E. E.	Fr.	Portland
Scott, Albert Miles	Agri.	Soph.	Ada
Scott, Clarence Vincent	Agri.	Jr.	Oak Park, Ill.
Scott, Elmer Riggs	Agri.	Fr.	Ada
Scrivner, Ina	H. E.	Sr.	Boise, Idaho
Sears, Briton	M. E.	Spec.	Portland
Sears, Cassie	Opt.		Amity
Seeley, Hazel Martenia	Opt.		Independence
Seely, Elmer Glen	Agri.	Jr.	Wilsonville
Seely, Marie	H. E.	Voc.	Medford
Seggel, Louis William	Agri.	Sr.	Jersey City, N. J.
Seibert, Harry	E. E.	Sr.	Pendleton
Selby, Halbert Edgerton	Agri.	Jr.	Bellingham, Wash.
Selover, Eleanor Marie	H. E.	Fr.	Klamath Agency
Selph, Raymond	Agri.	Soph.	Sheridan
Sessions, Philip Roddis	Com.	Jr.	Portland
Shake, Harold	Phar.	Spec.	Payette, Idaho
Shake, Rodney Hudson	E. E.	Fr.	Payette, Idaho
Shank, Arthur Lincoln	Agri.	Soph.	Seattle, Wash.
Shankland, Albert	I. A.	Soph.	Estacada
Sharp, Anne	H. E.	Fr.	Yamhill
Shattuck, Mrs. Goldie Opal	H. E.	Voc.	Burns
Shaver, Leonard Raymond	Min.	Fr.	Portland
Shaw, Ralph Fred	Agri.	Spec.	Portland
Shawver, Loyd James	Agri.	Voc.	McMinnville
Shedd, Bertha Lucile	H. E.	Soph.	Shedd
Shepard, Fred Cecil	Agri.	Sr.	Roosevelt
Sheppard, Will Orville	Com.	Fr.	Hood River
Sherrod, Frances Fern	H. E.	Fr.	Berkeley, Calif.
Shields, Harley Rex	Phar.	Sr.	Amity
Shook, Gaylord	Phar.	Spec.	Meridian, Idaho
Short, Clara Elaine	Opt.		Corvallis
Short, Vivian Frank	Agri.	Voc.	Corvallis

Name.	Course.	Rank.	Home Address.
Sibley, Cassius.....	Agri.	Fr.....	San Bernardino, Calif.
Sieberts, Adolph Gustaff.....	Com.	Jr.	Portland
Silver, Kathleen	H. E.	Voc.	Ashland
Silver, Madeleine	H. E.	Voc.	Ashland
Simpson, John Ernest.....	M. E.	Jr.	Portland
Sims, Andrew Raymond.....	Min.	Soph.	Woodburn
Sims, Bonnie Marine.....	H. E.	Fr.	Sheridan
Singh, Mahadeo	Agri.	Soph.	Hasanpore, India
Sinks, Victor Hammond.....	E. E.	Sr.	Portland
Sitton, Paul	Agri.	Voc.	Carlton
Sivenius, Charles Victor.....	Com.	Soph.	Astoria
Skelton, Albert Gordon.....	C. E.	Jr.	Corvallis
Skelton, Mary Vernon.....	H. E.	Sr.	Corvallis
Skidmore, Maude May.....	H. E.	Fr.	Curtin
Slayton, Mabel Adaline.....	H. E.	Fr.	Prineville
Slayton, Mildred Lura.....	H. E.	Fr.	Prineville
Smilie, Robert Stanley.....	L. E.	Soph.	Oakland, Calif.
Smith, Clifton.....	Min.	Sr.	Salem
Smith, Doyle Bertie.....	Com.	Fr.	Salem
Smith, Elizabeth Hargraves.....	H. E.	Sr.	Corvallis
Smith, Elva	H. E.	Soph.	Portland
Smith, Harvey	Agri.	Soph.	Corvallis
Smith, Henry Anderson.....	Com.	Fr.	Portland
Smith, Hiram Chester.....	I. A.	Soph.	Newberg
Smith, Howard Parvin.....	Agri.	Sr.	Corvallis
Smith, Hubert	Phar.	Spec.	Clovis, Calif.
Smith, Kathryn Matilda.....	H. E.	Spec.	Marshfield
Smith, Laurence Howard.....	Com.	Soph.	Frances, Wash.
Smith, Leone Adell	H. E.	Soph.	Carnation
Smith, Margaret Irene.....	Com.	Soph.	Medford
Smith, Marion Ruth	H. E.	Voc.	Weed, Calif.
Smith, Orville Charles.....	Min.	Fr.	Albany
Smith, Wendell	Agri.	Fr.	Jennings Lodge
Smith, Wallace	Agri.	Fr.	Corvallis
Smith, Wilbur Joseph.....	M. E.	Fr.	Rainier
Smyth, Darius	Phar.	Sr.	Baker
Smyth, Fred Wendell.....	Com.	Fr.	Diamond
Snowberger, Fred	Phar.	F. Yr.	Payette, Idaho
Soden, Frances Jeanette.....	H. E.	Spec.	Portland
Soderstrom, Victoria Jennie.....	H. E.	Soph.	Halsey
Sodhi, Charn Singh.....	Com.	Jr.	Quetta, India
Somers, Eugenia Hazel.....	Agri.	Sr.	Corvallis
Somers, George Brooks.....	Min.	Soph.	Ft. Wayne, Ind.
Soo, Taki Herbert.....	Agri.	Sr.	Hong Kong, China
Soth, Rodney Olen.....	Agri.	Sr.	Toledo, Iowa
Southern, Raymond Duncan.....	E. E.	Fr.	Brownsville
Spalding, Anna Mary.....	H. E.	Voc.	San Francisco, Calif.
Spalding, Donald Parker.....	For.	Jr.	Lowell, Mass.
Sprague, Hazel Emma.....	H. E.	Jr.	Corvallis

Name	Course	Rank	Home Address
Spriggs, James Llewellyn	Agri.	Fr.	Portland
Staiger, Guy	Phar.	Fr.	Corvallis
Stark, Ailene	H. E.	Soph.	Eugene
Stark, Leslie	Com.	Soph.	Holdrege, Nebr.
Stearns, Carey Sumner	Agri.	Voc.	Prineville
Steele, Roy	Agri.	Fr.	Portland
Steiger, Freda Amelia	H. E.	Fr.	Klamath Falls
Stephens, James Thomas	For.	Spec.	Beagle
Stephenson, Mervyn	Hi. E.	Fr.	Condon
Steusloff, Claude	Agri.	Fr.	Salem
Stevens, Kenneth	Com.	Fr.	Albany
Stewart, Harry James	Agri.	Fr.	Portland
Stewart, James Oscar	Agri.	Fr.	Lorella
Stewart, Stanley Earl	Agri.	Spec.	Seattle, Wash.
Stickler, Walter Clarke	Agri.	Voc.	Pleasanton, Calif.
Stidd, Charles Leland	Com.	Jr.	Corvallis
Stidd, Erma Phoebe	Com.	Spec.	Corvallis
Stimpson, Etta Lorene	H. E.	Soph.	Corvallis
Stockdale, Elbert Walter	Com.	Fr.	Mt. Vernon
Stone, Herman Al	For.	Soph.	Woodburn
Stoneberg, Hugo	Agri.	Sr.	Coburg
Stoneroad, Paul Lewis	Agri.	Fr.	Portland
Stoppenbach, Donald Chapman	E. E.	Sr.	Portland
Storm, Earl Vasberg	For.	Soph.	Milton
Storms, Kate Clare	Opt.		Laredo, Mo.
Storrs, Isabella Garrison	H. E.	Fr.	Pomona, Calif.
Storrs, Ruth Parsons	H. E.	Fr.	Pomona, Calif.
Story, Carl Leverne	Com.	Sr.	Airlie
Storz, Charles	Phar.	Sr.	Portland
Stow, William Raymond	Agri.	Soph.	Salinas, Calif.
Strader, Ruth Moore	H. E.	Fr.	Pomona, Calif.
Straughn, Orson	Agri.	Soph.	Pendleton
Streiff, Albrecht	E. E.	Jr.	Hillsdale
Strome, Carey Lloyd	Agri.	Sr.	Corvallis
Strome, Glenn Smyth	Agri.	Soph.	Eugene
Strome, Katherine Marcelle	H. E.	Fr.	Corvallis
Strong, Geoffrey	Com.	Fr.	Myrtle Creek
Strong, Ida Marianne	H. E.	Spec.	Monmouth
Strowbridge, Howard Blasdel	Agri.	Fr.	Portland
Struck, Martha Bertha	H. E.	Jr.	Lyle, Wash.
Stuwe, Herman Carl	I. A.	T. Yr.	Aurora
Summers, Mitchell	Com.	Fr.	Condon
Supple, Joseph	Agri.	Soph.	Oakland, Calif.
Sutherland, Frank Gillette	Agri.	Jr.	Honolulu, Hawaii
Sutton, Harry Allen	Min.	Sr.	Aumsville
Swan, Harry Twiss	Min.	Fr.	Baker
Sweeney, Philips Brooks	Agri.	Fr.	Walla Walla, Wash.
Tadlock, Laura Christine	H. E.	Soph.	Corvallis
Tallmadge, Frances Moore	H. E.	Voc.	Portland

Name.	Course.	Rank.	Home Address.
Tamerlane, Rex	M. E.	Sr.	Portland
Tanner, Clifford Gilbert.....	Agri.	Jr.	Morro, Calif.
Tatham, Frank Selby.....	Com.	Fr.	Portland
Taylor, Armond	For.	Spec.	Klamath Falls
Taylor, Eva Gertrude.....	H. E.	Voc.	Corvallis
Taylor, Herbert Harold.....	For.	Fr.	Lowell, Mass.
Taylor, Harold	Agri.	Sr.	Baker
Teeter, Mrs. Katharine Hitchcock.....	H. E.	Spec.	Corvallis
Thayer, Harold	Agri.	Soph.	Rainier
Thayer, Jessie	Opt.		Rainier
Thayer, John Alden.....	Agri.	Fr.	Rainier
Theobald, Wanda Muir.....	H. E.	Sr.	Silverton
Thomas, Frank	Agri.	Fr.	Salt Lake, Utah
Thomas, George Warren.....	Agri.	Soph.	Auburn, Ind.
Thomas, Herbert Franklin.....	For.	Spec.	Duluth, Minn.
Thomas, Marie Laura.....	H. E.	Fr.	Auburn, Ind.
Thomas, Ralph William.....	C. E.	Sr.	Corvallis
Thompson, Benjamin Garrison.....	Agri.	Spec.	Shedd
Thompson, Byron Cooley.....	Com.	Fr.	Brownsville
Thompson, Cecil Adelbert.....	Agri.	Soph.	Stevensville, Mont.
Thompson, Earl Horstad.....	Agri.	Sr.	Pasadena, Calif.
Thompson, Elmer Julian.....	Agri.	Sr.	Minneapolis, Minn.
Thompson, Gertrude Luella.....	Opt.		Portland
Thompson, Mildred Irene.....	H. E.	Spec.	Pasadena, Calif.
Thoms, Harold Wayne.....	Min.	Soph.	Jefferson
Thrailkill, Jay Everett.....	M. E.	Soph.	Weiser, Idaho
Throne, Robert Franklin.....	M. E.	Jr.	Ashland
Tidball, Lynn Hudson.....	Com.	Soph.	Corvallis
Tillery, Gladys	H. E.	Fr.	Corvallis
Tillery, Merle	Com.	Jr.	Corvallis
Tilley, Walker Boutelle.....	For.	Jr.	Arcata, Calif.
Tilton, Arthur James.....	Agri.	Fr.	Portland
Tinker, George Henry.....	Agri.	Voc.	Seattle
Todd, Jr., Charles Brooke.....	Agri.	Soph.	Webster Grove, Mo.
Tonseth, Einar Aune.....	Com.	F. Yr.	Fairbanks, Alaska
Tooker, Floyd Llewellyn.....	Com.	Fr.	Salem
Towne, Elbert Louis.....	Opt.		Carrolls, Wash.
Towne, Mildred Beulah.....	H. E.	Fr.	Carrolls, Wash.
Trigg, John William.....	Agri.	Voc.	Ferndale, Calif.
True, Mrs. Elsie Gay.....	H. E.	Sr.	Corvallis
Truesdell, Charles Milton.....	Agri.	Fr.	Redlands, Calif.
Tubbesing, William Herman.....	M. E.	Fr.	Portland
Tulley, Stewart Wendell.....	Agri.	Sr.	Corvallis
Turnbull, James Lockhart.....	Min.	Jr.	Mooreville
Turner, Arthur Edward.....	I. A.	Sr.	North Powder
Turner, Harold Willard.....	I. A.	Jr.	Eugene
Turner, Jesse Oland.....	Agri.	Sr.	Heppner
Turner, Winnifred	H. E.	Sr.	Corvallis
Tuttle, LeRoy James.....	For.	Soph.	Cumberland, Wis.

Name.	Course.	Rank.	Home Address.
Tweed, Catherine	H. E.	Fr.	Corvallis
Tweed, Robert	Agri.	Sr.	Corvallis
Tyrrel, Claude Alonzo.....	Agri.	Fr.	Alhambra, Calif.
Underwood, Edward Franklin.....	Agri.	Sr.	Dufur
Underwood, Joseph Marion.....	Min.	Soph.	Pasadena, Calif.
Uyei, Nao	Agri.	Sr.	Ohyodo, Mil, Japan
Van Buskirk, Elinor.....	H. E.	Fr.	Portland
Van Buskirk, Mac	Agri.	Soph.	Portland
Van Couvering, Martin.....	Min.	Sr.	Riverside, Calif.
Vandecar, Mary	H. E.	Voc.	Haines
Van Horn, Ray Radecliff.....	Com.	Fr.	Fossil
Van Norden, Freeman Loys.....	Agri.	Soph.	The Dalles
Van Orden, Walter Hamilton.....	Min.	Spec.	Corvallis
Van Orsdel, Clark Thomas.....	L. E.	Spec.	Dallas
Van Raes, Fred Adolph.....	Com.	F. Yr.	Fairbanks, Alaska
Van Winkle, Dorothy Charlotte.....	H. E.	Spec.	Spokane, Wash.
Varma, Sanghi Ram.....	Agri.	Soph.	Batala, India
Vaughan, Blanche La Verne.....	Com.	S. Yr.	Smithfield, Ill.
Vedder, Harold Troxell.....	M. A.	S. Yr.	Grants Pass
Vestal, Edgar	Agri.	Sr.	Payette, Idaho
Vestal, James Finix.....	I. A.	Fr.	Eagle Point
Vierhus, Albert Victor.....	Min.	Soph.	Oregon City
Vihari, Ambalal Jivabhoy.....	Com.	Fr.	Baben, India
Vilas, George Warren.....	Com.	Jr.	Medford
Vincent, George Sylvester.....	C. E.	Sr.	Sherwood
Virgil, Fannie Eldora.....	H. E.	Soph.	Klamath Falls
Visel, Nelson	Agri.	Sr.	Santa Ana, Calif.
Vogel, Anna	H. E.	Spec.	Corvallis
Vogel, Charles Emmons.....	Agri.	Voc.	Corvallis
Vogelsang, Dorothy Marie.....	Com.	F. Yr.	Corvallis
Von Lehe, Herbert Henry.....	Agri.	Soph.	Corvallis
Voruz, Ruth	H. E.	Fr.	Baker
Waddell, Gladys	Com.	Spec.	Long Beach, Calif.
Wagner, Henrietta	H. E.	Soph.	Laurel, Ind.
Waite, Katherine Douglas.....	Phar.	Fr.	Roseburg
Wakeman, William James.....	L. E.	Sr.	Portland
Walen, Lulu.....	H. E.	Fr.	North Yakima, Wash.
Walker, Claude Gilbert.....	Agri.	Sr.	Fairbanks, Alaska
Walker, Ethel Elaine.....	H. E.	Fr.	Corvallis
Walker, Eva Estelle	H. E.	Sr.	Florence
Walker, Thomas	Agri.	Voc.	Fairbanks, Alaska
Walling, Ethel Lucile.....	Opt.		Salem
Walton, Fremont Winston.....	Agri.	Jr.	Salem
Walton, Roy Frank.....	M. E.	Fr.	Portland
Ward, Sidney Valentine.....	Com.	Voc.	Goldendale, Wash.
Wascher, Frank Earl.....	Agri.	Soph.	Portland
Watenpugh, Harold Leory.....	Agri.	Fr.	Ontario, Calif.
Waterfall, Charles Hardy.....	Com.	Jr.	Vancouver, B. C.
Waterman, Fay Ernestine.....	Phar.	Sr.	Hermiston

Name	Course	Rank	Home Address
Waterman, Whitney	Agri.	Fr.	Pasadena, Calif.
Waters, Frank Northup	E. E.	Fr.	Portland
Watson, Irvin	Agri.	Soph.	Corvallis
Watson, Virginia Glenn	Opt.		Aberdeen, Wash.
Wattenburger, Ina	H. E.	Jr.	Echo
Watters, William Harp	Min.	Sr.	Corvallis
Weatherly, Jessie	Com.	Fr.	Portland
Weaver, Clifford Scott	Phar.	Spec.	Springfield
Webber, John	Min.	Fr.	Independence
Weber, Richard Merle	Agri.	Fr.	The Dalles
Wedel, Nettie	H. E.	Voc.	Aberdeen, Idaho
Weller, Theodore Warford	Agri.	Sr.	Corvallis
Wells, Richard	Agri.	Spec.	Seattle, Wash.
Werlein, Edward Eldridge	E. E.	Fr.	Portland
Werner, Richard John	Agri.	Jr.	Los Angeles, Calif.
Werth, Conrad Walter	E. E.	Soph.	Portland
Wescott, Merton Girard	Agri.	Spec.	Winter Harbor, Me.
West, Ralph Lowell	Agri.	Sr.	Westport
Westervelt, Raymond	Min.	Fr.	Portland
Wetteland, Rolf Theodore	M. E.	Sr.	Camas, Wash.
Wharton, Jane Azalea	Com.	Spec.	Roseburg
Wharton, Malcolm	Agri.	Fr.	Garden Grove, Calif.
Wheeler, Alfreda Margaret	H. E.	Spec.	Corvallis
Wheeler, Alvin Wilbur	Agri.	Sr.	Corvallis
Wheeler, Coleman Hawley	L. E.	Fr.	Portland
Wheeler, Harold Edward	Com.	Soph.	Portland
Whipple, Gladys Louise	H. E.	Sr.	Corvallis
Whitby, Harris	Com.	Jr.	Corvallis
White, Charles Elmer	Agri.	Voc.	Cato, N. Y.
White, Ethel Belle	Opt.		Brownsville
White, Harold	Com.	F. Yr.	Kerby
White, Roy Whitworth	Agri.	Spec.	Seattle, Wash.
White, Walter	Phar.	Sr.	McMinnville
Whitham, Strayer Earle	Agri.	Spec.	Corvallis
Whitmore, Corrine Marion	H. E.	Voc.	Jermyn, Pa.
Wicks, Forrest Thrift	M. E.	Jr.	Albany
Wiglesworth, Myra	Com.	Sr.	Union
Wilcox, Lyle	Agri.	Sr.	Milton
Wilcox, Ralph	Com.	Jr.	Portland
Wild, James Herbert	Agri.	Fr.	Portland
Wilkes, Clair	Agri.	Jr.	Hillsboro
Wilkins, Leroy Edmond	Agri.	Fr.	Soquel, Calif.
Wilkins, William Elmer	Com.	Spec.	Condon
Willer, Ernest Koch	Phar.	Spec.	Detmold, Germany
Willey, Earl Clark	M. E.	Soph.	Coquille
Williams, Ivan	M. E.	Spec.	Athens, N. Y.
Williams, Llewellyn Morris	Com.	Soph.	Corvallis
Williams, Miriam Blanche	H. E.	Sr.	Fort Sanderdale, Fla.
Williams, Richard	Agri.	Spec.	Newberg

Name.	Course.	Rank.	Home Address.
Williams, Richard Hipsley.....	Agri.	Fr.	Salmon, Idaho
Williams, Robert Franklin.....	Agri.	Fr.	Cove
Williams, William.....	E. E.	Jr.	Portland
Williamson, Martha Jane.....	H. E.	Fr.	Corvallis
Williamson, Pearl Frances.....	H. E.	Sr.	Albany
Williamson, William Hesper.....	Agri.	Voc.	Pasadena, Calif.
Willoughby, Charles Elbert.....	Com.	Fr.	National City, Calif.
Wilmot, Richard Kenneth.....	For.	Soph.	Portland
Wilt, Clarence Oliver.....	M. A.	S. Yr.	Corvallis
Wilson, David McKinnen.....	For.	Sr.	Linnton
Wilson, Jalmar.....	M. E.	Soph.	Astoria
Wilson, John Bushrod.....	Agri.	Jr.	Corvallis
Wilson, Olive Isabel.....	H. E.	Jr.	Yoncalla
Wilson, Otis Estee.....	M. E.	Fr.	Salem
Wilson, Robert Whipple.....	Engr.	Spec.	Corvallis
Wilson, Stella Nora.....	H. E.	Fr.	Salem
Winder, Beatrice Vesta.....	H. E.	Spec.	Oakland, Calif.
Wingert, Arlo.....	Agri.	Voc.	Haratine Is., Wash.
Winsor, Charles Joseph.....	Com.	Spec.	North Bend
Winter, Thaddeus Ardina.....	Agri.	Fr.	Los Angeles, Calif.
Wise, Clarence Jerome.....	Com.	Soph.	Corvallis
Witzig, Ivy Emily.....	H. E.	Sr.	Corvallis
Wolfe, Glenn Alfred.....	I. A.	Fr.	Corvallis
Wolfe, Ira John.....	Agri.	Jr.	Mt. Vernon, Wash.
Woodburn, Howard Robert.....	L. E.	Jr.	Portland
Woodcock, Arthur James.....	Phar.	Soph.	Portland
Woods, Lee Roy.....	For.	Sr.	Cottage Grove
Woodsum, Edna May.....	H. E.	Fr.	Corvallis
Woodward, Roy Elmer.....	For.	S. C.	Corbett
Woodworth, Gladys.....	Com.	Spec.	Portland
Woodworth, Grace.....	Opt.		Portland
Wootton, William Barker.....	I. A.	Spec.	Astoria
Wotton, Richard.....	Agri.	Fr.	Friday Harbor, Wash.
Wright, Dorothy Lois.....	H. E.	Soph.	Portland
Wright, Mark Foss.....	For.	Sr.	Forest Grove
Wright, Marshall Simpson.....	Agri.	Fr.	Sierra Madre, Calif.
Wright, Minnie Ethel.....	H. E.	Jr.	La Grande
Wright, William SoRelle.....	Agri.	Soph.	San Gabriel, Calif.
Yamamoto, Francis.....	E. E.	Soph.	Seattle, Wash.
Yates, Eva.....	H. E.	Soph.	Alsea
Yates, Lloyd Dexter.....	For.	Jr.	Milton
Yeager, Francis DeWitt.....	Agri.	Sr.	Centralia, Wash.
Yeatman, Sara Eleanor.....	H. E.	Sr.	Oakland, Calif.
Young, Adam Glenn.....	Agri.	Voc.	Atlanta, Ga.
Young, Vida.....	H. E.	Jr.	Stayton
Zetzman, Wilma Magdalene.....	H. E.	Voc.	Cornelius
Ziegler, Helen Marie.....	H. E.	Fr.	White Salmon, Wash.
Ziegler, Laura Elizabeth.....	H. E.	Fr.	White Salmon, Wash.
Zosel, Elsie Louise.....	H. E.	Voc.	Salem

SUMMER SCHOOL STUDENTS

(Course classification in the Summer School roll is necessarily arbitrary. Few students register in a single group of subjects. Where the major subject is easily determined it is indicated as Art, Commerce (Com.), Education (Ed.), Home Economics (H. E.), Methods in Teaching (Meth.), Music. College (Coll.) indicates those who took college courses included in two or more of the foregoing or in other subjects. Agriculture (Agri.) indicates Boys' Agricultural Course.)

Name.	Course.	Home Address.
Abraham, Herman J.	Coll.	Albany
Abraham, Richard	Meth.	Forest Grove
Abegg, Fred	Coll.	Portland
Anderson, Ella R.	Coll.	Cottage Grove
Anderson, Helen Best	H. E.	Portland
Anderson, Joan	Com.	Medford
Appelman, Marguerite	Mus.	Corvallis
Armstrong, Josephine	Art	Corvallis
Armitage, H. Carleton	Coll.	Sunset Beach, Calif.
Asbahr, Katherine	Coll.	Cornelius
Atwood, Elmina	Coll.	Corvallis
Balcom, Herbert	Meth.	Medford
Baldwin, Ernest L.	Coll.	Winlock, Wash.
Ballard, Alice Julia	H. E.	Meredith
Ballin, Hubert	Coll.	Portland
Bauchet, Herman	Coll.	Condon
Barrett, Inez	H. E.	Portland
Barton, Raymond	Agri.	Salem
Bassett, Olive Pauline	Coll.	Newberg
Beals, Agnes	Coll.	Corvallis
Bechen, Martha Henrietta	Coll.	Hillsboro
Bedynek, John	Mus.	Corvallis
Beebe, Alice	H. E.	Eugene
Beebe, Edith	H. E.	Eugene
Benson, Mary Ellen	Art	Cottage Grove
Benson, Mrs. Orpah	Meth.	Cottage Grove
Birch, Gracia D.	Coll.	Corvallis
Bocklund, Bessie	Meth.	Husum, Wash.
Boies, Etta	Coll.	Corvallis
Bovee, Robert	Coll.	Corvallis
Boyd, Mrs. Martin Francis	Meth.	Corvallis
Bracons, Josephine	Coll.	Portland
Brandes, Irene	Coll.	Portland
Brewer, Grace M.	Coll.	Portland
Brown, Zoe A.	Coll.	Seaside
Buret, C. W.	Meth.	Hillsboro
Burnell, Ruth	Coll.	Claremont, Calif.
Burns, Thomas	Meth.	Corvallis
Cain, Grace	Meth.	Corvallis
Case, Richard	Coll.	Portland
Cavender, Alberta	Coll.	Portland

SUMMER SCHOOL STUDENTS

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Name.	Course.	Home Address.
Chioco, Juan	Coll.	St. Domingo, Philippines
Clock, Audrey	Coll.	The Dalles
Cochrane, Adone	Coll.	Albany
Conklin, Evelyn	Art	Grants Pass
Connell, Henry	Meth.	Eatonville, Wash.
Connell, Mrs. Bertha	Coll.	Eatonville
Cooley, Florence	Coll.	Junction City
Cooley, Inez	Coll.	Junction City
Cordley, Dorothea McLouth	Art	Corvallis
Croswhite, John Raymond	Coll.	Long Beach
Cunning, Jennie	Art	Baker
Cunningham, Bessie	Com.	Woodburn
Cunningham, Beulah	H. E.	Corvallis
Damon, Ruth	H. E.	Corvallis
Darby, Herbert	Agri.	Salem
Darling, Ruth	Mus.	Corvallis
Davis, Robert	Meth.	Prineville
Delk, Charles	Agri.	Drain
Denniston, Laneta	Coll.	McMinnville
Deyo, Edna	Meth.	Eagle Creek
Dietsch, Frank	Com.	Day Creek
Dolde, W. E.	Com.	Corvallis
Doolittle, Maida	Coll.	Corvallis
Doxsee, Earl DeWitt	Meth.	Brownsville
Dryden, Winfield Joseph	Com.	Corvallis
Dunn, Lucile	H. E.	Portland
Ellested, Theo.	Meth.	Central Point
Emery, Juanita	Coll.	Corvallis
English, Charles	Meth.	Ashland
Fiedler, Anna	Mus.	Corvallis
Fiedler, Elizabeth Clare	Coll.	Corvallis
Fitts, Grace	Mus.	Corvallis
Foster, Harriett	Coll.	Corvallis
Freyler, Edna	Coll.	Corvallis
Friday, Roberta Fay	Coll.	Hood River
Frost, Louis	Agri.	Salem
Garrett, G. S.	Meth.	Corvallis
Gaskins, Mrs. Leon	Com.	Corvallis
Gates, Pearl Emmogene	Coll.	Corvallis
Gerke, Walter Henry	Coll.	Portland
Gerking, Beulah Bethsheba	Meth.	Pleasant Hill
Goddard, Jackson	Meth.	Cottage Grove
Gooding, Loyd	Meth.	Harrisburg
Green, Helen	Com.	Newberg
Grimes, Etta	H. E.	Portland
Hall, Mildred Augusta	H. E.	Corvallis
Hansen, Harold	Coll.	Portland
Hanson, Manette	Coll.	Corvallis
Hardie, Jessie	Art	Condon

Name	Course	Home Address
Hamlin, Louis	Mus.	Corvallis
Hamlin, Lucile Anna	Art	Corvallis
Hathaway, Marcus Francis	Coll.	Corvallis
Hathaway, Merle Alice	Coll.	Corvallis
Hemphill, John Cannon	Agri.	Albany
Henry, Laurel	Meth.	Pullman, Wash.
Heater, R. E.	Meth.	Hillsboro
Hess, F. P.	Coll.	Corvallis
Hiestand, Zula	Com.	Corvallis
Hill, Ruth Jessie	H. E.	Eugene
Hoaglund, Aurilla	H. E.	Gresham
Hobart, Alvin	Agri.	Silverton
Holt, Hazel	Com.	Corvallis
Horning, Helen Mabel	Coll.	Corvallis
Hubbard, Chauncey Mulks	Coll.	Monroe
Hubbard, Roland	Coll.	Medford
Huddy, Hanora	Meth.	Portland
Hughes, Winfield	Meth.	Ilo, Idaho
Hukill, Myra Evangeline	Coll.	Corvallis
Humphrey, Esther Cynthia	Coll.	Eugene
Irving, Iona	Coll.	Corvallis
Irving, Robert	Agri.	Corvallis
Jackson, Eva	Coll.	Portland
Jackson, Laura	Coll.	Lorane
Johnson, Anna Marie	Meth.	Albany
Jones, O. H.	Meth.	Eugene
Jordan, Marvin	Coll.	Corvallis
Kan, Frank F.	Coll.	Nom Tong, China
Kelly, Ethel	H. E.	Drain
Kerr, Marion	Mus.	Corvallis
Ketchum, Jean	Coll.	Independence
King, William	Meth.	Eugene
Kleinwachter, Bertha	H. E.	Atlanta, Ga.
Knight, Florence	Coll.	San Luis Obispo, Calif.
Lamb, Howard	Coll.	Fossil
Lamoureux, Louis Andre	Coll.	Ft. Wordsworth, N. Y.
Lane, Bernice	Art	Corvallis
Lane, Dorothy Elizabeth	Coll.	Corvallis
Lane, Vivian Maude	Coll.	Harrisburg
Lasswell, Avery Loyd	Coll.	Portland
Leeper, Enid Glenda	Meth.	Corvallis
Leshner, Lucile Josephine	Meth.	Portland
Lewis, Ada Snow	Coll.	Somerville, Mass.
Logan, Helen Elizabeth	Coll.	Escondido, Calif.
Long, Walter Scott	Com.	Portland
Loo, Nai Fat	Coll.	Canton, China
McCornack, Alice	Coll.	Marcola
McCornack, Helen Evelyn	Coll.	Marcola
McFarlane, Mrs. Mary	Meth.	Salem

SUMMER SCHOOL STUDENTS

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Name.	Course.	Home Address.
McIntyre, Frank	Coll.	Hartford, Conn.
McIntyre, Frederick	Agri.	Oswego
McKay, James Douglas	Coll.	Portland
McMindes, Elvin Winfield	Com.	Lorane
McPherson, Daisy	H. E.	Pendleton
MacDonald, Helen	Coll.	Corvallis
Manuel, Mildred Martin	H. E.	Oakland, Calif.
Marshall, Julian Stephens	Com.	Portland
Masterton, David	Coll.	Corvallis
Matthews, Verle	Coll.	Corvallis
Matthiew, Theo.	H. E.	Stayton
Mercer, Helen Bernetta	Coll.	Salem
Metzler, Ethel	Coll.	Corvallis
Miller, Emily Marie	Meth.	Corvallis
Miller, Eva	Coll.	Fillmore, Ill.
Miller, Helen	Coll.	Corvallis
Morgan, Beulah Inez	H. E.	Corvallis
Morse, Mildred	H. E.	West Lafayette, Ind.
Morse, Wilmetta	Coll.	West Lafayette, Ind.
Moses, Everett	Mus.	Corvallis
Morton, Ruth	Coll.	White Salmon, Wash.
Myers, Eva	Meth.	Long Creek, Ill.
Newkirk, Rhoda	Meth.	Oregon City
Nichols, A. R.	Meth.	Corvallis
Nichols, Fred	Coll.	Glendale, Calif.
North, David S.	Meth.	Monmouth
Parcher, Phillip	Meth.	Marysville, Mo.
Parpala, Taimie	Coll.	Nasel, Wash.
Parrish, Philip	Com.	Corvallis
Parrish, Robert	Coll.	Corvallis
Passmore, Dorothy Ellen	Coll.	Tualatin
Patterson, Margaret	Meth.	Ashland
Patterson, Winifred	H. E.	Corvallis
Pechin, W. G.	Coll.	Forest Grove
Persinger, Clanton	Com.	Corvallis
Peterson, Joy Cecil	H. E.	Beaverton
Philpott, Elsie	Meth.	Prosper
Pickett, Perry Nathan	Agri.	Salem
Pimm, Alice Petra	Meth.	Philomath
Plank, Esther	Coll.	Woodburn
Prill, Alice	Coll.	Chetek, Wis.
Rawlings, Ellen Madeline	Coll.	Albany
Reed, D. R.	Meth.	Tillamook
Richardson, Ivy Rose	Coll.	Tacoma, Wash.
Ridenour, Elinor	Art	Corvallis
Ripley, Mrs. Miriam Sheldon	Meth.	The Dalles
Robey, Donald	Meth.	Marysville, Mo.
Robinson, Mary	Coll.	Corvallis
Romtvedt, Alvchild	Meth.	Toledo

Name.	Course.	Home Address.
Russell, John Martin	Coll.	Portland
Sarft, Gladys Versal	H. E.	Duluth, Minn.
Sanders, George	Meth.	The Dalles
Sanders, Mrs. Hazel M.	Coll.	The Dalles
Seeley, Hazel	H. E.	Independence
Sellers, Tressa	H. E.	Creswell
Sevy, Genevieve Bertha	Coll.	Milton
Sevy, I. B.	Meth.	Milton
Sevy, Mrs. Orpha	Meth.	Milton
Sherwood, Rose Agnes	Coll.	Portland
Simons, Avery	Agri.	Sodaville
Simons, Glenn,	Agri.	Sodaville
Simons, L. A.	Meth.	Sodaville
Skei, Alfred	Meth.	Mt. Angel
Smith, Elizabeth	H. E.	Gardena, Calif.
Smith, Grace	Meth.	Portland
Spaulding, Donald	Coll.	Lowell, Mass.
Staley, Paul	Agri.	Salem
Stevens, Henry Clowes	Coll.	Portland
Stidd, Charles Leland	Coll.	Corvallis
Storz, Charles	Com.	Portland
Strachan, Lexie	Meth.	Dufur
Straughan, J. A.	Meth.	Pendleton
Strome, Katharine Marcelle	Coll.	Corvallis
Struck, Martha B.	H. E.	Lyle, Wash.
Sweeney, Edna	Meth.	Buell
Thomas, George Randolph	Meth.	Portland
Thomas, Walter	Meth.	Washougal, Wash.
Thompson, J. B.	Meth.	Portland
Tompkins, Mabel	Com.	Monroe
Vanaker, Mrs. W. J.	Art	Corvallis
Vickers, H. A.	Coll.	Corvallis
Vineyard, Sara Bledsoe	Meth.	Boise, Idaho
Wagner, Henrietta	Coll.	Laurel, Ind.
Waterfall, Charles Hardy	Coll.	Vancouver, B. C.
Waters, Roderick	Agri.	Salem
West, George	Agri.	Portland
Whipple, Gladys Louise	H. E.	Portland
Whitby, J. Harris	Coll.	Corvallis
Whitham, Earle	Coll.	Corvallis
Williams, Edna	Mus.	Alpine
Williams, Miriam Blanche	Coll.	Fort Landerdale, Fla.
Williamson, Lorna	Coll.	Corvallis
Williamson, Louise	Com.	Medford
Williamson, Martha	Coll.	Corvallis
Williamson, Pearl Frances	Coll.	Albany
Wilson, Kenneth	Agri.	Salem
Wilt, Clarence Owen	Coll.	Sisters
Witzel, Edith	Meth.	Salem

SPECIAL MUSIC STUDENTS*

Name.	Course.	Home Address.
Adams, Harry	Clarinet	Corvallis
Appelman, Marguerite Ruth.....	Voice	Corvallis
Bauer, Marian	Piano	Corvallis
Bedynek, John	Violin	Corvallis
Blount, Corinne	Voice	Corvallis
Boies, Blanche	Violin	Corvallis
Broders, Chester	Piano	Corvallis
Brown, Mark Lester	Cornet	Corvallis
Brown, Mrs. W. S.	Piano	Corvallis
Browning, Pansy	Violin	Corvallis
Brumbaugh, Madeline	Violin	Corvallis
Buckingham, Lottie May	Piano	Blodgett
Burton, Mabel Stevens	Voice	Corvallis
Cordley, Dorothea McLouth	Voice	Corvallis
Eaton, Helen	Piano	Independence
Fisher, Mrs. Gertrude	Voice and Organ	Philomath
Florida, Edna	Voice	Corvallis
Foster, Ada Elizabeth	Piano	Corvallis
Fuselman, Elizabeth Frances.....	Violin	Corvallis
Graham, Willa	Saxophone	Corvallis
Gray, Glenva	Violin	Corvallis
Grimm, Hazel	Voice	Corvallis
Hamlin, Louis Ward	Violin	Corvallis
Hanson, Florence	Violin	Corvallis
Hardman, Eleanor	Piano	Corvallis
Hargrove, Harriet	Voice	Salem
Hatch, Leonard Smith	Clarinet	Corvallis
Hawson, Lucile.....	Violin	Condon
Hess, Lorinne	Voice	Astoria
Howell, A. E.	Voice	Corvallis
Jackson, Nellie	Violin	Moro
Jokisch, Donald Irving	Violin	Corvallis
Knight, E. F.	Voice and Piano.....	Vancouver, Wn.
Kerr, Geneve	Piano	Corvallis
Kerr, Marion	Violin	Corvallis
Kiger, Martha	Piano	Corvallis
Kuhlman, Mrs. D.	Voice	Corvallis
Lowell, Ethel May	Piano	Corvallis
McLeod, Jessie Anna	Piano	Corvallis
Neale, Dorothy Ellen	Piano	Corvallis
Osborne, James	Voice	Corvallis
Oxford, Klein Etta	Piano	Corvallis
Peck, A. L.	Violin	Corvallis

* In addition to the names listed here, 170 regular students of the College whose names are listed elsewhere in the catalogue took work in the School of Music.

Name.	Course.	Home Address.
Schubert, Placidus	Violin	Corvallis
Shiple, Alarine	Piano	Philomath
Short, Mabel	Piano	Corvallis
Siler, Beatrice Pauline	Voice and piano	Randle, Wash.
Skipton, Laurence	Violin	Corvallis
Smyth, Lenora Mary	Piano	Diamond
Snyder, Helen	Piano	Corvallis
Taylor, Velma	Piano	Corvallis
Tharp, Ethel Wave	Voice	Corvallis
Todhunter, Grace	Piano	Corvallis
Warren, Mrs. Olive Frances	Violin	Corvallis
Watkins, Anna	Piano	Philomath
Watson, Margaret	Piano	Corvallis
Williams, Mary Edna	Piano	Alpine
Williams, Mrs. Richard	Voice	Corvallis
Williamson, Mary	Organ	Corvallis
Yates, Bertha Lois	Piano and Voice	Shedd
Yates, Irma	Piano	Corvallis

WINTER SHORT COURSE STUDENTS

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WINTER SHORT COURSE STUDENTS

Name.	Home Address.
Adams, Frances	Silverton
Alexander, E. H.	Sheridan
Annala, F. J.	Hood River
Ashton, Charles Rice.....	Tangent
Ashton, John Paul	Lebanon
Barfoot, May Emily	Corvallis
Barss, A. F.	Corvallis
Beck, Roy S.	Corvallis
Bennett, Enos S.	Sheridan
Bergstrom, Ellen	Gooseberry
Bergstrom, Emma	Eight Mile
Bergstrom, Hannah	Eight Mile
Bergstrom, John	Eight Mile
Bissell, S. T.	Yreka, Calif.
Blackden, Ralph	Corvallis
Boden, John	Portland
Boesel, Albert H.	Scappoose
Bohrnstedt, Mrs. A. C.	Macleay
Bohrnstedt, A. C.	Macleay
Boulan, Frank H.	Sheridan
Brodie, Mrs. R. K.	Corvallis
Brown, Bertha	Amity
Carter, Clarence M.	Alicel
Case, B. O.	Vancouver, Wash.
Cooper, Kenneth L.	Mosier
Cooper, Mrs. Kenneth L.	Mosier
Cooper, Mrs. George E.	Corvallis
Copple, Mrs. Mary M.	Philomath
Crain, Julia	Santa Cruz, Calif.
Crum, Mrs. S. E.	Olex
Davolt, Mrs. Claud O.	Corvallis
Dickinson, H. R.	East Sound, Wash.
Downie, Archie T.	Portland
Dorman, Mrs. Louis B.	Corvallis
Farmer, Oliver	Shedds
Fish, Henry	Lynden, Wash.
Gay, J. L.	Corvallis
Gadegaard, Christian	Marshfield
Geary, Harry Logan	Underwood, Wash.
Gillenwater, Glen	Hillsboro
Golden, Mrs. C. E.	La Grande
Graham, S. C.	White Salmon, Wash.
Gravesen, G. C.	Coles Valley
Gross, Charles	Corvallis
Grubbe, Lola	Elkton
Gulliford, Arthur J.	Eugene
Gulliford, Mrs. Arthur J.	Eugene

Name.	Home Address.
Gunn, Mrs. R. J.	Corvallis
Hacking, Esther	Corvallis
Hamilton, Herbert C.	Prineville
Hammond, Mrs. H. S.	Corvallis
Harper, William	Junction City
Hawson, Lucile	Condon
Heminger, Willard L.	Corvallis
Heminger, Mrs. Norris	Corvallis
Henderer, Charles G.	Elkton
Himelwright, Lyle	Klamath Falls
Hogan, Eli	Corvallis
Hohnan, Ralph L.	Molalla
Howell, Delbert	Woodburn
Hoyt, Charles H.	Jefferson
Hukari, William T.	Hood River
Hurd, Mrs. G. Lansing	Corvallis
Johnston, Mrs. Bessie	Corvallis
Jorgensen, Peter	Portland
Kay, O. E.	Wellen
Keasey, C. C.	Corvallis
Kerr, Mrs. A. J.	Hubbard, Ohio
Knox, John J.	Fossil
Lafferty, Mrs. Pearl	Corvallis
Landreau, C. Z.	Corvallis
Langlois, James M.	Langlois
Ling, Mrs. E. E.	Corvallis
LittleJohns, Helen C.	Corvallis
Loomis, Mrs. W. I.	Corvallis
McCart, Earl	Harrisburg
McCready, Mrs. C. E.	Corvallis
McDonald, G.	San Francisco, Calif.
McDonald, L. A.	Corvallis
MacKinnon, John	Naches, Wash.
MacRae, Earl	Portland
Mainwaring, Hazel	Langlois
Maris, Mrs. Paul V.	Corvallis
Maronda, Mary	Corvallis
Masterton, Mrs. C. H.	Corvallis
Matthews, Mrs. R. R.	Corvallis
Miller, Iwan Z.	Gervais
Miller, Harry Dale	Corvallis
Montell, Edgar W.	Hood River
Muller, E. W.	Helix
Moore, Mrs. Alina	Mt. Vernon
Myers, Grace Adelle	Lookingglass
Neale, John Edward	Nelson, B. C.
Nestelle, Mrs. E. H.	Seattle, Wash.
Nielsen, Christian	McCoy

Name.	Home Address.
Noyes, Frederic B.	Oakland, Calif.
Olsen, E. W.	Blind Slough
Parker, John	Oregon City
Persinger, W. C.	Corvallis
Peterson, Mrs. Emelia	Corvallis
Phillips, Bertha C.	Corvallis
Potter, Mrs. E. L.	Corvallis
Reed, Medford	Linnton
Reed, Mrs. Medford	Linnton
Richey, G. H.	Corvallis
Richter, Theodore	Amity
Roberts, Elliott P.	The Dalles
Robinson, P. M.	Carlton
Rosencrants, Dorothy	Corvallis
Rosencrants, J. W.	Corvallis
Ruth, Mrs. C. C.	Corvallis
Salzman, A. G.	Corbett
Sayre, Noble G.	Condon
Shelton, Arthur L.	Pomeroy, Wash.
Shelton, Wilbur	Pomeroy, Wash.
Shrook, M. S.	Forest Grove
Sprague, Louise	Gardiner
Smith, Harry	Corvallis
Sproul, Niles	Canyon City
Stegerwald, Andrew	Corvallis
Stevenson, Mrs. A. L.	Corvallis
Stockton, R. V.	Sheridan
Stoller, Fred E.	Trout Lake, Wash.
Stout, Erwin Cory	Sheridan
Swanson, Axel N.	Portland
Talbott, Roscoe A.	Grand Ronde
Tappert, Paul R. W.	Harrisburg
Taylor, Mrs. William	Prairie
Teeter, Mrs. Katharine H.	Corvallis
Theobald, Zelda	Silverton
Tucker, Mrs. Bertha G.	Corvallis
Uhlman, Walter	Ridgefield, Wash.
Uptegrove, G. M.	Parkdale
Utter, Ruth	Corvallis
Vierhus, James L.	Oregon City
Wade, Henry S.	Pomeroy, Wash.
Walker, Mrs. M. L.	Corvallis
Ward, Sidney V.	Goldendale, Wash.
Watson, James A.	Pomeroy, Wash.
Weart, George	Hood River
Wellman, Walter	Baker
Wickethier, A.	Portland
White, Georgia	Corvallis

Name.	Home Address.
Whitmore, Rodney M.	Corvallis
Wilkinson, R. C.	Lompoc, Calif.
Wilkinson, Mrs. R. C.	Lompoc, Calif.
Wilson, Alta	Riddle
Witter, George H.	Kent
Wood, J. LeRoy	Albany
York, F. M.	Carlton
York, Mrs. M. O.	Corvallis
Young, P. A.	Albany

NOTE.—In addition to the above listed names, out of a total of 1673 students registered in the Farmers' Week and in the special Home Economics courses, the names of 1213 students who were registered in these courses, but in no other College courses, do not appear.

HONOR STUDENTS

Honor students, at graduation, are selected on a basis of pre-eminence in both class work and student activities. All courses are represented by honor students, the representation being on the basis of one honor student to every ten seniors in each degree course. No student, however, will be named in the honor list whose merit grade is below seventy-five. The selection is made jointly by faculty and students.

SELECTION FOR JUNE 1915

AGRICULTURE

Hill, Charles Edwin.

Curtis, Roland Edward.

Miller, Roy Edmund.

Gentner, Louis Gustave Oswald

Gilbert, Henry.

Case, Richard Burton.

Belton, Howard Clair.

Flint, John Walter.

FORESTRY

Chamberlin, Willard Joseph.

PHARMACY

Smith, Simeon Charles.

COMMERCE

Burns, Lillian.

Crouter, Leogrand DeHart.

DOMESTIC SCIENCE AND ART

Warner, Katherine.

Crockatt, Edith.

Hansen, Beneta Kareen.

Chase, Lucile.

Seeley, June.

Burns, Amelia Earle.

ENGINEERING

Oakes, Charles Ernest.

Hubbard, Harry Lee.

Larsen, Walter Winfred.

CLARA H. WALDO PRIZES

The Clara H. Waldo Prizes are awarded on a basis of both scholarship and general achievement as follows: (a) Proficiency in literary and scholastic attainments; (b) Success in student activities; (c) Qualities of womanhood; (d) Qualities of leadership. The selection is made by a joint arrangement between faculty and students. To the senior woman selected, a prize of forty dollars is awarded; to the junior woman, thirty dollars; to the sophomore woman, twenty dollars; and to the freshman woman, ten dollars. Students receiving second and third place in each class are given Honorable Mention.

SELECTION FOR JUNE 1915

SENIORS

Frances Lucile Chase,
Beneta Kareen Hansen,
Lorene Augusta Parker,

SOPHOMORES

Lorna Anne Collamore,
Grace Woodworth,
Grace Kinnison,

JUNIORS

Ruth Marion Mateer,
Geraldine Newins,
Della Jackson,

FRESHMEN

Lulu Litten May,
Gertrude Luella Thompson,
Genevieve Frazier,

FORENSIC HONOR ROLL

515

FORENSIC HONOR ROLL
FOR 1914-15

INTERCOLLEGIATE ORATOR

F. J. Dietsch

INTERCOLLEGIATE PEACE ORATOR

Z. A. Lansdale

INTERCOLLEGIATE DEBATORS

E. H. Reichart

H. W. Russell

G. R. Hoerner

R. R. Reichart

H. M. Currey

V. J. Garvin

E. J. Fraley, Alternate.

CHAMPION INTERCLASS ORATOR

Eric Englund

CHAMPIONS IN INTERCLASS DEBATE

E. Englund

A. O. Leech

Freshmen

T. J. Lowe

WINNER OF SHAKOPEAN CUP

Awarded annually to the member of the senior class
having the best record in forensics for
the whole College course.

Currey, H. M.

SUMMARIES*

CLASSIFIED AS TO COURSE

(All Duplicates Excluded)

Course	Men	Women	Total
Agriculture	549	6	555
Forestry	56		56
Logging Engineering	19		19
Home Economics		352	352
Engineering and Industrial Arts	230	1	231
Mining	79		79
Commerce	130	43	173
Pharmacy	61	9	70
Optional	3	51	54
Music	12	48	60
Summer School	95	142	237
Winter Short Courses	793	572	1365
Total	2027	1224	3251**

CLASSIFIED AS TO RESIDENCE

(All Duplicates Excluded)

States and Territories:

Oregon	2668
Alaska	9
California	154
Colorado	16
Connecticut	3
Florida	2
Georgia	2
Idaho	53
Illinois	13
Indiana	10
Iowa	7
Kansas	10
Kentucky	1
Louisiana	2

* The enrollment statistics include only those who have pursued work at the College; correspondence students are omitted.

** Total to and including March 16, 1916.

SUMMARIES

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Maine	2	
Massachusetts	6	
Michigan	5	
Minnesota	8	
Missouri	8	
Montana	8	
Nebraska	1	
New Hampshire	1	
New Jersey	2	
New York	12	
North Dakota	6	
Ohio	10	
Oklahoma	3	
Pennsylvania	5	
Tennessee	1	
Texas	1	
Utah	4	
Vermont	1	
Virginia	1	
Washington	161	
Wisconsin	7	
Wyoming	1	536

3204

Foreign Countries:

Australia	2	
Canada	13	
China	8	
England	3	
Germany	1	
Hawaii	1	
India	9	
Japan	3	
Norway	1	
Philippine Islands	1	
Russia	2	
Scotland	1	
Sweden	2	47

Net total		3251
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COMPARATIVE ENROLLMENT

1888-1889	97
1889-1890	151
1890-1891	201
1891-1892	208
1892-1893	282
1893-1894	240
1894-1895	261
1895-1896	397
1896-1897	316
1897-1898	336
1898-1899	388
1899-1900	405
1900-1901	436
1901-1902	448
1902-1903	541
1903-1904	530
1904-1905	680
1905-1906	735
1906-1907	833
1907-1908	1156
1908-1909	1352
1909-1910	1591
1910-1911	1778
1911-1912	2868
1912-1913	2314
1913-1914	2435
1914-1915	4176
1915-1916*	3251

The great difference in the total enrollment for the two years, 1910-11 and 1911-12, was due largely to the increase in the number of students registered for the winter short courses in Agriculture. The increase in the number of regular students in the 36-weeks courses was 24 per cent.

The decrease in the number of students in 1912-13 from the year 1911-12 is due to the decrease in the short course registration. The increase in the number of regular students in the 36-weeks courses was 19 per cent.

* Totals to and including March 16, 1916.

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C
on 3H
1916/17

NO. 259

ISSUED SEMI-MONTHLY

MAY 15, 1917

OREGON AGRICULTURAL COLLEGE BULLETIN



College Catalogue 1917-18

WITH LIST OF STUDENTS FOR 1916-17

CORVALLIS, OREGON

Entered as second-class matter May 9, 1916, at the postoffice at Corvallis, Oregon,
under the Act of August 24, 1912.



CATALOGUE
OF THE
Oregon Agricultural College
FOR
1917-18

With List of Students for 1916-17



CORVALLIS, OREGON

MAY 15, 1917

CORVALLIS
COLLEGE PRINT SHOP
1917

CALENDAR 1917-18

1917.

JULY	AUGUST	SEPTEMBER
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CHANGES IN DATES IN THE BODY OF THIS CATALOGUE

Changes in the College Calendar authorized by the Board of Regents, May 25, 1917, involve announcements made in this catalogue, according to the regular calendar, as follows:

Page 58, opening of dormitories, from September 16 to October 7.

Page 63, examinations for admission to College, from September 17 and 18 to October 8 and 9.

Page 69, date of registration, from September 17 and 18 to October 8 and 9.

COLLEGE CALENDAR 1917-18

1917.

October 8, 9, Monday, Tuesday — Registration and examinations for admission.

October 5, Friday — Quarterly meeting of Board of Regents.

October 10, Wednesday — Recitations begin.

November 5, Monday — Forestry Short Course begins.

November 29, Thursday — Thanksgiving, a legal holiday.

December 22, Saturday (noon) — Christmas recess begins.

1918.

December 31 - January 5, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday — Farmers' and Home Makers' Week and Rural Life Conferences.

January 7, Monday — Regular exercises resumed. Winter Short Course begins.

January 9, Wednesday — Quarterly meeting of Board of Regents.

February 1, Friday — Winter Short Course ends.

February 2, 4, 5, 6, Saturday, Monday, Tuesday, Wednesday — First semester examinations.

February 11, 12, Monday, Tuesday — Second semester registration.

February 13, Wednesday — Recitations begin.

February 22, Friday — Washington's birthday; a legal holiday.

April 3, Wednesday — Quarterly meeting Board of Regents.

April 12, Friday — Forestry Short Course ends.

May ————— Military inspection day.

May 30, Thursday — Decoration Day; a legal holiday.

June 2, Sunday — Baccalaureate sermon.

June 3, Monday — Senior Class Day exercises; Alumni Reunion.

June 4, Tuesday — Commencement exercises.

Final examinations for the second semester will be held on Tuesday afternoon, June 4; Wednesday, June 5; Thursday, June 6; and Friday, June 7.

June 10, Monday — Summer session begins.

July 20, Saturday — Summer session closes.

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HON. C. L. HAWLEY, Treasurer.....	McCoy

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	Term Expires
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HON. C. L. HAWLEY.....	McCoy, 1918
HON. M. S. WOODCOCK.....	Corvallis, 1918
HON. WALTER M. PIERCE.....	La Grande, 1921
HON. H. VON DER HELLEN.....	Wellen, 1921
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HON. CLARA H. WALDO.....	Portland, 1924
HON. N. R. MOORE.....	Corvallis, 1924
HON. JEFFERSON MYERS.....	Portland, 1924

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CHARLES JARVIS McINTOSH, B. S.,
Instructor in News Writing; Editor of Press Bulletins.

JOHN HARRISON BELKNAP, B. S.,
Instructor in Physics.

BARBARA MOORE, B. S.,
Instructor in Domestic Art.

* On leave of absence.

GRACE CHRISTINE ROSAAEN,
Instructor in English.

ASA CHANDLER, Ph. D.,
Instructor in Zoology and Physiology.

CHARLES JUNIUS CONOVER, M. S.,*
Instructor in Forestry.

JOHN EDWARD COOTER, B. S.,
Instructor in Soils.

HELEN PEER,
Instructor in Domestic Art.

CHARLOTTE LEWIS NELSON, A. B.,
Instructor in Physical Education for Women.

RUSSELL MARION HOWARD, B. S.,
Instructor in Accounting.

CHRISTIE MOORE, B. S.,
Instructor in Domestic Science.

LILLIAN MABEL GEORGE, B. L. S.,
In Charge of Continuations Department, Library.

KATHERINE BARBARA HAIGHT,
Preceptress, Cauthorn Hall.

MILTON JOHN SEELEY, Ph. C.,
Instructor in Chemistry.

EDNA MAY FLARIDA,
Instructor in Art.

DEXTER RALPH SMITH, B. S.,
Instructor in Civil Engineering.

CORA ELIZABETH PLATT,
Instructor in Domestic Art.

WILLIS DHU AINE PEASLEE, E. E.,*
Instructor in Electrical Engineering.

RALPH McBURNEY, M. S.,
Instructor in Bacteriology.

* On leave of absence.

OREGON AGRICULTURAL COLLEGE

ROBERT ANDREW DUNCAN, A. M.,
Instructor in Chemistry.

HOWARD SPURR HAMMOND, M. A.,
Instructor in Botany; Curator of the Botanical Herbarium.

ALDEN FORREST BARSS, A. B., M. S.,
Instructor in Horticulture; Assistant in Horticulture, Experiment
Station.

FRANK WALTER KEHRLI, B. S.,
Field Dairyman, Extension Service.

ETHA MABEL MAGINNIS,
Instructor in Stenography.

LEONARD JOHN ALLEN, M. S.,
In charge Pig Club Work, Extension Service.

MELISSA MARGARET MARTIN,
Instructor in Modern Languages.

JUNE SEELEY, B. S.,
Instructor in Domestic Art.

IRWIN LEONARD BETZEL, B. S.,
Instructor in Pharmacy.

LAURA CHENEY, B. S.,
Instructor in Domestic Science.

GRACE PATTON GILLETT, B. S.,
Instructor in Domestic Art.

ARTHUR CLIFFORD McCULLOCH, B. S. A.,
Instructor in Poultry Husbandry.

IRENE TELFORD,
Instructor in Physical Education for Women.

SYLVESTER BOYER, A. B.,
Instructor in Chemistry.

EDITH FREEMAN SHERMAN,
Instructor in Art.

MARGARET MOREHOUSE, B. S.,*

Instructor in Domestic Art.

WILLARD JOSEPH CHAMBERLIN, B. S.,*

Instructor in Entomology; Assistant in Entomology, Experiment Station.

PAUL STANLEY LUCAS, B. S. A.,

Instructor in Dairy Manufactures.

CHARLOTTE NEVIL HURD, A. M.,

Instructor in Zoology.

DAVIS ELLSWORTH REED,

Instructor in Industrial Arts.

MINNIE KALBUS, B. S.,

Instructor in Domestic Science.

HARRISON DUANE LOCKLIN, M. S.,

Instructor in Pomology.

CLYTIE MAY WORKINGER,

Secretary to Director of Experiment Station.

NORMA WADDLE, B. S.,

Assistant in Seed Testing Laboratory.

JACOB CORNOG, A. B.,

Instructor in Chemistry.

GUSTAV DUNKELBERGER, M. B.,

Instructor in Piano.

ANDREAS GOETTEL,

Instructor in Stringed Instruments; Director of College Orchestra.

GEORGE EMIL HECK, B. S.,

Instructor in Experimental Engineering.

MARTIN LOUIS GRANNING,

Instructor in Machine Shop.

LAURA CAMPBELL

Instructor in Physical Education for Women.

CARL HENNINGER, M. A.,

Instructor in Modern Languages.

RONALD DeVORE JOHNSON, First Lieut., Cavalry, U. S. Army,
Assistant Commandant; Instructor Military Science and Tactics.

* On leave of absence.

CYRUS FRANKLIN DUGGER, Post Commissary Sergeant, U. S.
Army, Retired, Assistant Commandant, Post Adjutant.

DENIS HAYES, Regimental Sergeant Major, U. S. Army, Retired,
Assistant Commandant, Post Quartermaster.

HARRY GEORGE MILLER, M. S.,
Instructor in Chemistry.

HOWARD MARSHALL WIGHT, B. S.,
Instructor in Zoology.

LOUISE ALBERTA SCHNEIDER,
Instructor in Domestic Art.

DALE EVERETT RICHARDS, B. S.,
Instructor in Animal Husbandry.

JAMES OBYE BECK, M. S.,
Instructor in Dairy Husbandry.

WALLACE LaDUE KADDERLY, B. S.,
Farm Management Specialist, Extension Service.

INEZ BOZORTH, B. S.,
Instructor in Domestic Science, Secretary School of Home
Economics.

EVERETT DOHERTY, B. S.,
Instructor in Chemistry.

FRANK LLEWELLYN BALLARD, B. S.,
Field Organizer, Bureau of Organization and Markets.

FRANK HEIDTMAN LATHROP, B. S., A. B.,
Instructor in Entomology, Experiment Station.

BERTHA HERSE, B. S.,
In charge Circulation Department in Library.

LILA GRACE DOBELL, B. S.,
Assistant in Library.

MARION BERTICE McKAY, M. S.,
Assistant in Botany and Plant Pathology, Experiment Station.

JOHN ROBERT MAGNESS, M. S.,
Assistant in Horticulture, Experiment Station.

GEORGE FRANKLIN MOZNETTE, B. S.,
Assistant in Entomology, Experiment Station.

HARRY AUGUST SCHOTH, M. S.,
Assistant in Farm Crops, Experiment Station.

THOMAS EVERETT MAY, B. S.,*
Assistant Coach and Manager of Athletics.

HAROLD ROY TAYLOR, B. S. A.,
Assistant in Dairy Husbandry.

ETHEL ALLEN, B. S.,
Assistant in Library.

SAMUEL ROBERT KLINE,
Stockroom Keeper, department of Chemistry.

CHARLES RAYMOND HURSH, B. S. A.,
Assistant in Plant Pathology, Experiment Station.

SAMUEL KILBOURN WHITE, Jr., B. S.,
Teaching Fellow in Horticulture.

LEON HAWKINS, B. S.,
Laboratory Assistant; Foreman College Orchards.

FRED WILLHELM MILLER, D. V. M.,
Fellow in Veterinary Medicine

BURR BLACK, B. S.,
Fellow in Plant Pathology and Entomology.

JOHN BREGGER, B. S.,
Fellow in Botany and Plant Pathology.

* On leave of absence.

COUNTY AGRICULTURISTS

HAROLD ROLAND GLAISYER, B. S.,
Klamath County.

ROY CLAUDE JONES, B. S.,
Tillamook County.

JAY LATTIMER SMITH, B. S.,
Coos County.

RALPH BLANCHARD, B. S.,
Crook and Deschutes Counties.

WALTER WILLIAM HOWARD, B. S.,
Malheur County.

CLAUDE CLIFTON CATE, B. S.,
Jackson County.

SYLVESTER BENJAMIN HALL, B. S.,
Multnomah County.

MANNES SEYMOUR SHROCK,
Yamhill County.

ARTHUR CHASE, B. S.,
Wasco County.

PAUL HERMAN SPILLMAN, B. S.,
Union County.

CHARLES THOMPSON, M. S.,
Josephine County.

NEWELL ROBB, B. S.,
Lane County.

CLARENCE LLOYD JAMISON, B. S.,
Wheeler County.

D. C. HOWARD, B. S.,
Columbia County.

SUPERINTENDENTS OF BRANCH EXPERIMENT STATIONS

EASTERN OREGON BRANCH EXPERIMENT STATION

Robert Withycombe, B. S.,
Union.

UMATILLA BRANCH EXPERIMENT STATION

Ralph Wilmer Allen, B. S.,
Hermiston.

**SHERMAN COUNTY DRY-FARM BRANCH EXPERIMENT
STATION**

David Edmund Stephens, B. S.,
Moro.

SOUTHERN OREGON BRANCH EXPERIMENT STATION

Frank Charles Reimer, M. S.,
Talent.

HARNEY VALLEY BRANCH EXPERIMENT STATION

Leroy Breithaupt, B. S.,
Burns.

JOHN JACOB ASTOR BRANCH EXPERIMENT STATION

Albert Edward Engbretson, B. S., (Acting Superintendent)
Astoria.

HOOD RIVER BRANCH EXPERIMENT STATION

Leroy Childs, A. B.,
Entomologist, Experiment Station,
Gordon George Brown, B. S.,
Horticulturist, Experiment Station,
Hood River.

OUTLINE OF COURSES OF STUDY

The Oregon Agricultural College offers the following courses of study, each of which extends over four years and leads to the degree of Bachelor of Science:

(Arranged alphabetically by schools and departments.)

In the **School of Agriculture**, major courses in—

- | | |
|--------------------------------|-------------------------------|
| (a) Agriculture (general) | (i) Entomology |
| (b) Agriculture for Teachers | (j) Farm Crops |
| (c) Agricultural Chemistry | (k) Farm Mechanics |
| (d) Animal Husbandry | (l) Horticulture |
| (e) Bacteriology | (m) Poultry Husbandry |
| (f) Botany and Plant Pathology | (n) Soils and Farm Management |
| (g) Dairy Husbandry | (o) Zoology |
| (h) Drainage and Irrigation | |

In the **School of Commerce**, major courses in—

- | | |
|------------------------------|-----------------------------------|
| (a) Accounting and Bus. Man. | (c) Government and Business Law |
| (b) Economics and Sociology | (d) Stenography and Office Train. |

In the **School of Engineering**, major courses in—

- | | |
|----------------------------|----------------------------|
| (a) Civil Engineering | (d) Industrial Arts |
| (b) Electrical Engineering | (e) Irrigation Engineering |
| (c) Highway Engineering | (f) Mechanical Engineering |

In the **School of Forestry**, major courses in—

- | | |
|----------------------|-------------------------|
| (a) General Forestry | (b) Logging Engineering |
|----------------------|-------------------------|

In the **School of Home Economics**, major courses in—

- | | |
|----------------------|------------------------------|
| (a) Domestic Art | (c) Home Administration |
| (b) Domestic Science | (d) Institutional Management |

In the **School of Mines**, major courses in—

- | | |
|--------------------------|------------------------|
| (a) Ceramic Engineering | (c) Mining Engineering |
| (b) Chemical Engineering | |

In the **School of Pharmacy**, a course in—

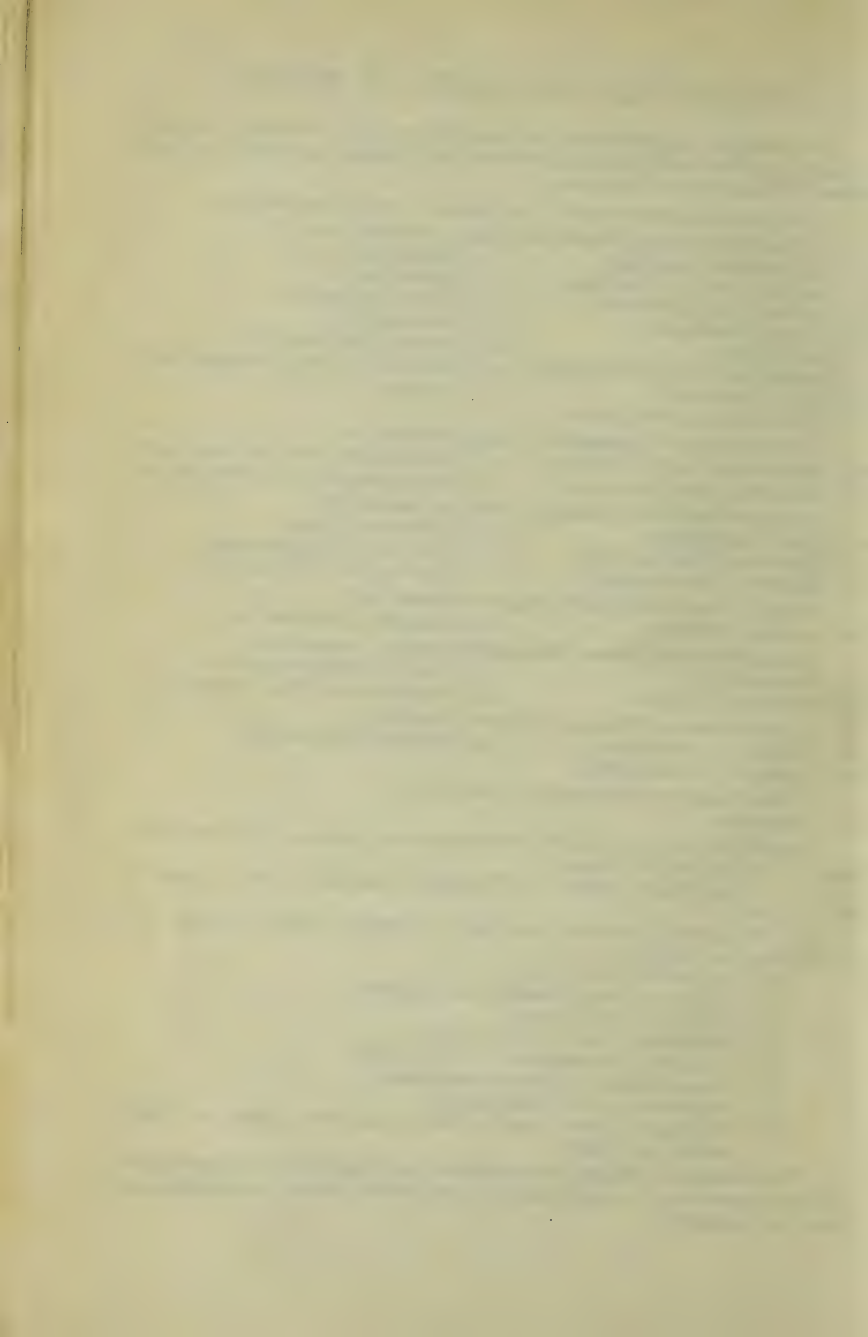
- (a) Pharmacy

In addition to the above baccalaureate courses, provision has been made for the following:

1. A two-years course in Pharmacy leading to the degree of Ph. G., and
2. Vocational courses, varying in length from 6 months to three years, as follows:

- A. Agriculture (one year).
- B. Business Short Course (two years).
- C. Dairying (one year).
- D. Dietitians' Course (two years).
- E. Forestry (November 5 to April 12).
- F. Home Makers' Course (one year).
- G. Mechanic Arts (three years).
- H. Pharmacy (two years, following two years of high-school training).

The **School of Music**, an affiliated self-supporting department, offers instruction in voice, piano, pipe organ, violin, orchestra, and band instruments.



GENERAL INFORMATION

FOUNDATION AND ENDOWMENT

In pursuance of an Act of Congress, approved by President Lincoln, July 2, 1862, a grant of land to the amount of thirty thousand acres, or its equivalent, was made to each state in the Union for each senator and representative in Congress to which the state was entitled by the apportionment of the census of 1860. The proceeds under this Act were to constitute a perpetual fund. The principal of this fund was to remain forever undiminished; but the interest arising from the fund was to be inviolably applied by each state that should avail itself of the benefits of the Act, to the support and maintenance of a "College where the leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislature of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." Ninety thousand acres of land were apportioned to Oregon; and by an Act approved October 9, 1862, the Legislative Assembly of Oregon accepted the provisions of the Congressional law.

Funds for the support of the College in its three grand divisions of work, Resident Instruction, Experiment Station, and Extension Service, are derived both from the National Government and the State of Oregon as follows:

FOR RESIDENT INSTRUCTION

From the National Government:

The Land-Grant Fund. The sale of the public land has netted the College approximately \$200,000. This at present is invested in securities bearing six percent interest. The Act of Congress of 1862 explicitly demands that no part of the funds so appropriated, or the interest arising therefrom, shall be used for the purchase, erection, or maintenance of any building or buildings.

The Morrill Fund. On August 30, 1890, an act was passed by Congress "to apply a portion of the proceeds of the public

land to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under the provisions of the Act of 1862." This act provides an annual fund of \$50,000.

From the State of Oregon:

The Millage Tax. The College is chiefly dependent for maintenance upon the income from the millage tax, as provided by the State legislature of 1913, which became operative April 1, 1915. The income from this source for the current year is \$351,500.

The State legislature of 1917 made a special appropriation of \$65,000 to apply toward the erection of a library building.

FOR EXPERIMENT STATION

Funds for the experimental work of the College, which is conducted both at the Corvallis Station and at seven branch stations located in different parts of the State, are derived from the National Government and from the State as follows:

From the National Government:

The Hatch Fund. Under an act of Congress, approved March 2, 1887, the College receives \$15,000 a year for the maintenance of an Agricultural Experiment Station, "to aid in acquiring and diffusing among the people useful and practical information on subjects connected with agriculture."

The Adams Fund. An act of Congress, approved March 20, 1906, appropriated an initial \$5,000 for that year, and \$2,000 additional for each year thereafter until the annual amount should reach \$15,000. This fund is "to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry" of the State, and therefore supplements the Hatch Fund in the maintenance of the Experiment Station.

For the support of the Branch stations at Moro, Hermiston, and Burns, the National Government appropriates \$6,700.

From the State of Oregon:

State Funds. The State Legislature of 1917 appropriated \$5,000 annually for the Corvallis station and an additional \$10,000 annually on condition that the National Government appropriate an equal sum. The State also appropriates \$28,000 annually for the support of the branch stations. Of this sum, \$3,000 appropriated

for the Hood River Branch Experiment Station is conditioned upon the county's appropriating \$2,000 for the support of the same station.

FOR EXTENSION SERVICE

From the National Government:

The Smith-Lever Fund. This fund was established by the Smith-Lever Agricultural Extension Act passed by Congress May 8, 1914. By its provisions the Oregon Agricultural College received \$10,000 from the Federal Government to apply towards the support of the Extension Service for the fiscal year ending June 30, 1915. This sum is to be increased annually for seven years until the total amount of \$30,200 is reached. This amount will continue as a permanent appropriation as long as an equal sum be "appropriated for that year by the legislature" of the State, "or provided by State, county, college, or local authorities, or individual contributions within the State for the maintenance of the cooperative agricultural extension work provided for in this Act."

The fund for the fiscal year July 1, 1916, to June 30, 1917, amounts to \$18,151.66. Since the State's obligation under this Act is fulfilled by matching the Government's increase over the original \$10,000, the State appropriates this year \$8,151.66 toward the support of this phase of Extension work.

Department of Agriculture Funds. The United States Department of Agriculture appropriates annually \$15,000 for cooperative work through Industrial Clubs, County Agents, Special Dairy Work, Marketing and Rural Organizations, and Farm Management and Business Demonstrations. The appropriation, however, is conditioned upon the State's granting an equal sum for the same purposes.

From the State of Oregon:

For General Extension Work. The State appropriates \$25,000 for general extension work, including movable schools, lectures, publications, Farmers' and Home-Makers' Week, correspondence, demonstrations in agriculture and home-making. From this fund money is set aside to meet the Smith-Lever requirements, which increase from year to year by about \$3,700. The fund is therefore more restricted in its uses every year.

For Cooperative Work. For cooperative work with the United States Department of Agriculture the State appropriates \$15,000 a year, to meet the requirements already indicated.

For County Agent Work. To meet the appropriations made by the several counties for maintaining the work of the county agents, the State is now appropriating approximately \$20,000 a year.

HISTORY

As there were no State colleges in Oregon in 1868, the legislature of that year, which provided for the location of the land received under the Act of 1862, gave the interest on the funds derived from the sale of the land to the Corvallis College, a private institution in Benton County, which was then under the control of the Methodist Episcopal Church, South. For a number of years, none of the land granted was sold, and the legislature made small annual appropriations for the support of the school.

In 1885, the church voluntarily relinquished its claim on the funds of the College, and the State assumed entire control of the institution. The legislature of that year provided for the "permanent location of the State Agricultural College at Corvallis, in Benton County," on condition that the citizens of said county should, within four years, erect on the "farm containing thirty-five acres in the immediate vicinity of said city, known as the Agricultural College Farm, brick buildings for the accommodation of said State Agricultural College at a cost of not less than \$20,000." During the summer of 1887, the corner stone of the building erected by the citizens of Benton County was laid by the Governor of Oregon amid imposing ceremonies.

This structure, now known as the Administration building, was the nucleus around which other buildings soon began to cluster, as necessity and growing interest demanded. For a year or two there was ample room; but, as the institution grew, more land was needed and provided, and the institution now owns, instead of the thirty-five acres originally comprising the campus and grounds, three hundred and forty-nine acres; and instead of one structure, thirty-six. There has also been a marked increase in the attendance, from ninety-seven to over four thousand students. Twenty years ago, most of the students came from Benton and neighboring counties. Today, every county in Oregon, 34 other states, and 15 territories and foreign countries are represented.

The increase in the number of students called for an increase in the number of the faculty. This body, from the number of five in 1884, has grown until it now closely approaches two hundred. Other features usually found in connection with progressive educational institutions have grown in equal ratio. The courses have been strengthened, the standards, both for entrance and graduation, have been advanced, and other improvements have been made from time to time, which have added to the thoroughness and efficiency of the work.

ORGANIZATION

The Oregon Agricultural College is organized into the three grand divisions that characterize the work of the land-grant colleges throughout the country; namely, Resident Instruction, Experiment Station, and Extension Service. Resident Instruction, which includes all work of teaching students at the institution, is the most distinctive feature of the College life. It has always been regarded as of first importance, and will doubtless continue to be so regarded, in spite of the increasing usefulness of extension work. The Experiment Station, through systematic experiments, investigation, and research, is engaged in a search for fundamental truth. Its work is of great importance; for without it, the work of the other two grand divisions would soon become sterile and ineffective. The Extension Service, which is the newest of the three grand divisions of the College, includes all means of imparting the message of the College to the people in their own communities. It is virtually an effort to make practical and more or less immediate application throughout the State of the available truths worked out by the Experiment Station or used for resident instruction.

GOVERNMENT

The general government of the College is vested primarily in the Board of Regents, and, under their control, in four other administrative bodies—the Administrative Council, the College Council, the Faculty, and the staffs of the Experiment Station and Extension Service. These bodies, in the exercise of their respective duties, determine the questions of policy and regulate all matters relating to the interests of the institution.

The Board of Regents consists of thirteen members, of whom the Governor, the Secretary of State, the Superintendent of Public

Instruction, and the Master of the State Grange, are ex-officio members. The nine other members are appointed by the Governor with the approval of the State senate, and hold office for a term of nine years. Under a law of the State legislature, passed in 1885, the Board of Regents constitutes a body corporate, under the name of "The Board of Regents of the State Agricultural College, * * with power to sue and be sued, and to make contracts," and to enact such regulations as may be necessary for the maintenance and development of the College.

The Administrative Council consists of the President of the College, the Director of the Experiment Station, the Director of Extension, the Deans of the different Schools, and the Director of the Summer School. The function of this Council is to consider and determine the larger questions of policy and administration.

The College Council is composed of the President of the College and all officers of administration and instruction with the rank of professor, associate professor, or assistant professor. This body considers all general questions relating to the educational work and policy of the College; arranges and correlates the courses of study, and determines the requirements for admission and graduation. The different committees of the College Council, representing the several schools of instruction, have charge of the enrollment and progress of students in the respective schools, and investigate the records of all candidates for graduation.

The College Faculty comprises members of the Administrative Council and the College Council and all other instructors, including members of the Experiment Station and Extension Service Staffs. It considers routine questions of method and discipline, a function for which it is particularly well adapted, being in close contact with all that pertains to student interests and student life.

The Experiment Station Staff includes the President of the College, the Director of the Experiment Station, the heads of the various departments of the School of Agriculture, and all assistants, engaged in research and experimental work. The members of this staff are engaged in the investigation of problems encountered in the development of the agricultural interests of the State. They also distribute, by means of correspondence, circulars, and station bulletins, information regarding their investigations.

The Extension Service Staff includes the President of the College, the Director of Extension Service, the Secretary of Ex-

tension Service, the State Leader and County Agents, the officers in charge of Boys' and Girls' Club Work, Extension Field Specialists in Horticulture, Dairy and Animal Husbandry, Agronomy, Poultry Husbandry, Organization and Markets, Highway Engineering, Home Economics, Farm Management Demonstrations, and members of the Resident Instruction Staff and Experiment Station Staff who assist in extension work.

The Students. The College does not undertake to prescribe in detail either its requirements or prohibitions. Students are met on a plane of mutual regard and helpfulness. Since the advantages of the institution are provided at public expense, the students are under special obligation to perform faithfully all their duties, not only to the College, but also to the community and to the State. Whenever the deportment of any student is such that his influence is inimical to the interests of the institution, he will be relieved from further attendance.

PURPOSE AND SCOPE

The purpose of the College is to provide, in accordance with the acts of Congress under which it is maintained, a liberal, thorough, and practical education—an education that will afford the training required for efficient service in different branches of industry. The distinctive technical work covers the three great fields of production, manufacture, and commerce. Special attention is given to the application of science. All the practical work in the laboratories, in the shops, in the orchards, and on the farm, is based on scientific principles. While the industrial or technical work is emphasized, the importance of a thorough general training, of mind development, and of culture, is recognized in all of the work throughout the institution. The object is to meet the demand for a broad and general education, supplemented by special technical training.

The work, therefore, covers a broad field, including technical courses along the different lines of agriculture, forestry, home economics, engineering, mining, commerce, pharmacy, industrial education, and industrial arts; with the necessary training in the basic subjects of mathematics and the natural and physical sciences; and also the general training in language, literature, history, economics, political science, civics, military tactics, and physical education, which constitutes an essential part of a liberal education.

In all the work of the institution, the object is to train the mind, the eye, and the hand to act in unison; to unfold and co-ordinate the faculties of mind and body; to develop a symmetrical manhood and womanhood, and a just appreciation of clean, upright citizenship.

LOCATION

The seat of the Oregon Agricultural College is Corvallis, a city of six thousand inhabitants, situated at the head of navigation on the Willamette River. As the name implies, it is in the heart of the far-famed Willamette Valley. It is readily accessible by steam and electric railway from all parts of the State; it has free mail delivery; there are many churches and no saloons, and the moral tone is equal to that of any city within the boundaries of the State. It is a city of homes, and its people are justly proud of the great institution in the midst of them, and jealously guard its good name.

Situated on high, well-drained land, open to the invigorating sea-breeze, Corvallis is one of the most healthful cities in the State. It has never been visited by any dangerous epidemic disease, and the possibilities of such visitation in the future appear remote; for the city has a complete modern sewerage system and first-class gravity water system, supplied from springs high up the slope of Mary's Peak, the tallest mountain in the Coast Range, some fifteen miles away to the westward. The city and its environs are conducive to wholesome student and home life. It has an ample supply of pure mountain water for all domestic and sanitary purposes. The atmosphere is purified and the climate ameliorated by almost constant ocean breezes — warm in winter and cool in summer. The surrounding landscape elicits praise from all who behold its delightful charms as viewed in the extensive area of fertile fields, gardens, and orchards. The wooded glens of the near-by foothills, and the lively mountain brooks, or the more pretentious streams frequented by canoe, row-boat, and launch parties, are fruitful sources of recreation; while the magnificent distant views to the eastward, where the fir-clad Cascade Mountains, with their wealth of trees and the perennially snow-capped sentinels — Hood, Jefferson, and the Three Sisters — present a constant panorama of picturesque mountain scenery. With such an environment, the city is truly an ideal location for a college and a home.

GROUNDS AND BUILDINGS

The College Grounds comprise three hundred forty-nine acres. That part of the grounds, ninety-one acres in extent, lying immediately about the several buildings, east of Cauthorn Avenue, and usually designated as the lawns and campus, is tastefully planted with both native and exotic ornamental trees, shrubs, and herbs. The one hundred and forty-three acres used for the farm, garden, and orchard operations, is so plotted and planted as to meet the demands of the various lines of work and still conform to a general scheme of landscape embellishment. This portion occupies a slightly elevated and gently undulating site wholly within the western limits of the city of Corvallis. In addition to the above plot, one hundred and fifteen acres, comprising the College stock farm, together with the horticultural and poultry tracts, lies just south of the city limits. Broad drives and walks traverse the campus in all directions, thus rendering every objective point easily accessible. The numerous specimen trees, groups of shrubbery, and massed borders are a source of enjoyment as well as of instruction to all those who frequent the grounds. The scheme of planting has been such as to give an air of peaceful activity, orderly effort, earnest purpose, and quiet refinement. Daily association with such scenes for a period of years, during the time when men and women are forming the habits of thought and action that will be theirs through life, is certain to have a deep-seated and enduring influence for good in molding the character of future citizens.

The following brief descriptions will convey a general idea of the principal buildings and the purposes for which they are used:

The Administration Building is a three-story brick structure, 90 x 120 feet, containing recitation rooms, the library, the offices of the President, the Registrar, the Business Manager, and the Director of the School of Music. Centrally located and on a slight eminence, it commands an unsurpassed view of the campus, the city of Corvallis, and the picturesque Cascades.

Science Hall, situated southeast of the Administration building, and constructed of gray granite and sandstone, covers a ground space of 85 x 125 feet, has three stories and basement, and contains fifty-five rooms. It is one of the most serviceable buildings on the grounds, and within it are housed the departments of Chemistry and Pharmacy, with their various laboratories, reci-

tation rooms, and lecture halls, together with the offices and laboratories of the Experiment Station chemists.

Agricultural Hall, standing southwest of the Administration Building, is the largest structure on the campus. It is an imposing edifice of brick and sandstone, consisting of the central or Administrative building, the north or Agronomy wing, and the south or Horticultural wing.

The central or Administrative building is 66 x 140 feet, four stories and basement, and contains conveniently arranged and well-lighted class rooms, laboratories, and offices. On the first floor are the offices of the Director of the Experiment Station and Dean of the School of Agriculture, the Professor of Poultry Husbandry, the Director of Extension Service, the State Leader of County Agriculturists, the State Leader of Industrial Clubs, the Editor of Publications, the Editor of Press Bulletins, and the College Exchange. The second floor is occupied by the department of Animal Husbandry, and the department of Industrial Education; the third floor, by the departments of Zoology and Entomology with their respective museums; and the fourth floor, by the departments of Bacteriology and Art.

The north or Agronomy wing is 72 x 130 feet, three stories high. It is thoroughly modern in all its equipment, and while intended solely for the work in Agronomy, at present accommodates also, temporarily, the School of Commerce. The first and second floors, occupied by the departments of Soils and Farm Management, Farm Mechanics, Farm Crops, and Drainage and Irrigation, contain, in addition to the offices of these departments, rooms variously devoted to laboratory and class purposes. All of the third floor and office rooms on the first and second floors are used by the School of Commerce.

The south or Horticultural wing is 72 x 130 feet, three stories high. In the basement are located laboratories for plant propagation, spraying, vegetable preparation, and fruit packing. The basement also contains the general storage rooms for the department, and rooms which are especially adapted for the storage of fruits. The first floor contains the offices of the division of Horticulture, the research laboratory, systematic pomology laboratory, and three large lecture rooms. The second floor contains the offices and museums of the department of Botany and Plant Pathology, recitation rooms, and student laboratories. The third

floor contains the horticultural museum and horticultural herbarium, photograph room, large student lecture room, draughting rooms, lecture rooms, and office of the Landscape Gardening section. These rooms are all especially well lighted and contain every convenience for conducting the work with efficiency.

Greenhouses. A range of greenhouses, aids the student in his studies in commercial greenhouse work. The range is made up of five even-span houses, three ninety feet long by twenty feet wide, and two thirty-three feet long by twenty feet wide, making the total area under glass 6,720 square feet. A hot-water heating apparatus has been installed, with valves and pipes so arranged that different temperatures can be maintained in every separate thirty feet of house in the three long houses. Each of the large houses has been divided into sections thirty feet long, so that the entire space in each may be given up to a single crop. Of the two smaller houses, one is given up to research work, and one to the propagation of plants in general. The central building is large and conveniently arranged for all work that is to be met with in greenhouse establishments. Such crops as carnations, chrysanthemums, violets, palms, ferns, general pot plants, and forced vegetables, like tomatoes, lettuce, and cucumbers, are grown in these houses.

Dairy Building. About sixty feet to the northward of the Agricultural building is located the Dairy building. The general scheme of both outside and inside finish is similar to that of the Agricultural building. The structure is 54 x 141 feet, three stories high. On the first floor are located the offices of the Dairy department and commodious laboratories for butter-making, cheese-making, and market milk instruction, including a well-equipped boiler and engine room and student lockers. On the second floor are the testing laboratory, advanced laboratory, farm dairy and shop rooms, veterinary laboratories, etc. The third floor is temporarily occupied by the department of mathematics, with the exception of a general lecture room, extending across the south end of this floor, and having a seating capacity of two hundred.

The Forestry Building. A three-story Forestry building, eighty feet wide and one hundred and thirty-six feet long, has been constructed to house the work in forestry and logging engineering. This building contains roomy laboratories for work in silviculture, dendrology, mensuration, forest protection, technol-

ogy, drafting, and logging engineering. As rapidly as material can be assembled these laboratories will be supplied with the various forms of instruments and equipment which the peculiar work of each requires. In addition to the laboratories, space is to be devoted to a collection of manufactured wood products, designed to show the various uses to which wood may be put, and to a forest museum in which will be assembled large specimens of all commercial woods of the United States. All available publications dealing with forestry and logging subjects are provided for the use of students. Portions of the building are used temporarily by the department of English.

Home Economics. The first wing, 68 x 120 feet, of the new Home Economics building is occupied by the departments of Domestic Science and Domestic Art. The building is located directly west from the Dairy building. It consists of three stories above a high basement, and is finely built of brick and stone. Heating and ventilating systems of the most modern type are installed, and all provisions are made for the comfort and convenience of the young women carrying the work in Home Economics. Offices for the Professors of Domestic Science and Domestic Art and the assistants in both Domestic Science and Domestic Art, are on the first, second, and third floors.

The food laboratories are on the first and second floors, while the Domestic Art department has all of the third floor of the building and part of the second floor. Ample locker and dressing rooms are provided for the convenience of the students, and hot and cold water is supplied in all parts of the building. The housing and equipment of the School of Home Economics, in short, are thoroughly modern, and adequate for immediate needs.

The Mines Building, which is 65 x 81 feet in dimensions, is located about 100 yards northwest of the Administration building, and is one of the newer buildings on the campus. This building forms the northern boundary of the quadrangle which is planned in the new building scheme on the College campus. It is a fine four-story structure, constructed of brick, trimmed with stone, and similar in type to Agricultural Hall. The first floor of the building contains the main offices, assaying, metallurgical and ore-dressing laboratories. The basement contains the crushing and sampling rooms, the ceramic laboratory, and the stock rooms. On the second floor will be found the Bureau of Mines laboratory

and lecture and class rooms. On the third floor is the geological museum, the mineralogical and petrological laboratories, and draughting room. All the laboratories are provided with water, gas, electric lights, and steam heat.

Mechanical Hall, situated about one hundred and fifty yards northeast of the Administration building, is 90 x 120 feet, two stories high, and constructed of Oregon gray granite and sandstone. It is an attractive, substantial building, well arranged and admirably adapted to the purposes for which it is used. Besides recitation and lecture rooms for the classes in Industrial Arts, Mechanical, Electrical, Civil, Highway, Irrigation, and Experimental Engineering, it contains the Physical and Engineering laboratories.

Mechanical Arts Building is a modern, well-lighted structure of brick, with cement foundations, 52 x 52 feet, two stories high, flanked by a one-story wing on the east, 40 x 220 feet, and a similar wing on the south, 40 x 200 feet. The central portion contains the office of the Dean, a display room for student work, a tool room for the machine shop, and a finishing room for the wood shop. On the second floor is a general draughting room, 30 x 50 feet, with a commodious blue-print room and a dark room adjoining. The south wing contains the main woodworking shop, 40 x 97 feet, a stock room, 30 x 40 feet, a carpenter shop, 20 x 40 feet, and the College printing plant, 40 x 50 feet. The east wing contains the machine shop, 40 x 80 feet, the blacksmith shop, 40 x 100 feet, store room for coal and iron, lockers, and toilet rooms.

The Foundry, which is located immediately south of the blacksmith shop, is built of brick. It contains one 22-inch Colliau cupola for melting iron, one brass furnace, one portable core oven, one stationary core oven for larger work, one twelve-hundred-pound crane ladle, one eight-hundred-pound crane ladle, and several smaller ladles. It contains also one crucible brass furnace, one two-ton jib crane, one post crane, one No. 2 Delano pulley molding machine, one tumbling barrel for cleaning castings, and a liberal supply of smaller tools, flasks, etc.

The Women's Gymnasium is situated about two hundred yards south of the Administration building, and is erected against a gently sloping bank on Jefferson street. The structure, 70 x 120 feet, is built of stone and wood, and comprises a high, airy basement, or first floor, facing east, with the main floor above it,

having a bank entrance on the west end. The first floor of the building is devoted to locker rooms, dressing rooms, bathrooms, and offices, together with a rest room and a special room for corrective gymnastics. The second floor consists chiefly of one large gymnasium room, which is also frequently used as a lecture hall, assembly room, and social center for moderate-sized gatherings. This room, which comprises 8,000 feet of floor space, is surmounted by a balcony running track, suspended from the trusses. It affords facilities, in a court of 79 x 54 feet dimensions, for basketball, indoor baseball, tennis, and various winter and indoor games. The building affords ample accommodations for the physical training of all the women of the institution.

The Men's Gymnasium is situated immediately west of Waldo Hall on Jefferson street, adjoining the main athletic field. The structure is to consist of four units, the central part being 90 x 150 feet, with each wing 52 x 96 feet in dimensions. The fourth unit will provide a swimming pool 50 x 100 feet, of modern design and finish. Only two units were completed during 1914, the main hall and the east wing. The main hall is used as a lecture and assembly room, or a place for entertainments when large audiences are to be accommodated. The showers and the baths are of modern design, providing hot and cold water throughout the year. The floor of the main hall with its 13,500 square feet of surface, provides space for three basketball courts, indoor baseball diamond, and space for various winter and indoor games. The east wing provides boxing and wrestling rooms, and an auxiliary gymnasium with special apparatus for use of the individual and for corrective gymnastics. When completed, the building will have accommodations for upwards of 2,000 men.

The Armory is situated about three hundred yards south of the Administration building. It is one of the largest of its kind in the United States and is built of concrete and steel, 126 x 355 feet. The drill hall portion has an unobstructed area of 36,000 square feet. The arms room, offices, and drill hall afford facilities for the accommodation of 1,000 men.

The New Heating Plant, located at the south end of the Armory, is a one-story reinforced concrete building, with a concrete tunnel and conduits leading to the various buildings on the south side of the campus. It contains three boilers, one two-hundred-ninety, one two-hundred-fifty, and one one-hundred-fifty-five horse-

power, with the necessary equipment for heating the buildings connected with it.

The Power Plant, a one-story brick building in the rear of Mechanical Hall, contains the requisite equipment for supplying the various buildings with heat, light, and power. The apparatus installed in this building serves the purpose also of demonstration equipment in these special lines.

Waldo Hall, one of the two halls of residence for women, occupies a commanding site one hundred and fifty yards west of the Armory. It is a large building of striking appearance, with a cement foundation and basement wall, and a cream-colored, pressed-brick superstructure, three stories high. The dimensions are 96 x 240 feet; and it contains one hundred and twenty-five rooms for students, besides a kitchen, dining room, and parlors. It is modern in all its appointments and finished throughout in natural grain Douglas fir, stained to conform to the color scheme.

Cauthorn Hall, the second of the women's halls of residence, is a well-proportioned frame building, situated on a commanding spot in the western part of the campus. It is 160 x 50 feet, has three stories and basement, and contains sixty-two rooms, besides a large kitchen, dining room, and reception rooms. Its furnishings and appointments are adequate, modern, and in harmony with its use. Each floor is supplied with hot and cold water, baths, electric light, and steam heat.

Shepard Hall, the student building under the auspices of the Y. M. and Y. W. C. A., was completed at a cost of something over \$22,000. This building contains in the basement a swimming pool, shower baths, lockers, banquet room, kitchen, wood room, and accessories. The first floor contains a large lobby which is used for a reading room, game room for social events, and general assembly. It also contains offices for the General Secretaries, a public office, a cabinet and check room combined, and a room for the Y. W. C. A. The second floor contains six rooms for the use of the literary and dramatic societies, the Cosmopolitan Club, and the staff of the Oregon Countryman. The building, known as Shepard Hall, is a fitting tribute to the memory of Clay Shepard, who gave his life to the cause of cleaner, higher, and truer citizenship as exemplified in student life.

Farm Buildings. The College Farm is now well equipped with farm buildings, and modern facilities for conducting practical and scientific work in animal husbandry.

The **Dairy Barn** is commodious, modern, and attractive in design. It is a frame building, with cement foundation and brick pilasters. The main part is 50 x 100 feet, two stories high, with two wings extending to the south, each 46 x 80 feet, one story in height. There is also a milk room, an engine room, and a fuel room. The building is utilized as a general barn, and will accommodate nine horses and seventy cattle, with sufficient space for the storage of feed. On the first floor of the main portion are located the horse stalls, bins for storing the various grains and mill feeds, a seed room, and space for vehicles. The concrete basement is of sufficient dimensions to permit the storing of about one hundred tons of roots. The second floor has a storage capacity for one hundred tons of loose hay. A prominent feature of the barn is the cow stable. This is strictly modern, well lighted and ventilated, with concrete floor, thirty individual, tubular-iron adjustable stalls, and three commodious box stalls. The aisles are wide, and thus not only furnish an abundance of air space for the animals, but also afford visitors an excellent opportunity to view the stock. The milk and engine rooms are conveniently situated, but sufficiently isolated for proper sanitation. This building is lighted by electricity, well supplied with water, thoroughly sewered, and furnished with an elaborate system of bell traps. Adjoining this stable is a stave silo, built several years ago, and a new concrete silo, completed in 1914, for use of the Dairy Husbandry department.

The old barns were moved and remodeled so as to harmonize with the new structure. They contain rooms for housing machinery and tools.

The New Cattle Barn. The department of Animal Husbandry is fortunate in having been able to erect a modern beef-cattle and sheep barn. It is located just west of the old barns, and has a floor space of 52 x 120 feet for sheltering stock. The hayloft has a storage capacity for 300 tons of hay and straw. Adjoining the barn are several concrete-floored exercise lots and a new stave silo. Especial conveniences are provided for the feeding, watering, weighing, and handling of live stock. The west half of the barn is at present devoted to beef cattle and the east half to

sheep, although it is planned that the entire barn will eventually be used for beef cattle.

The Stock Judging Pavilion. The Animal Husbandry work of the College is greatly facilitated by a judging pavilion, which provides very comfortable and commodious quarters for all of the demonstration work with live stock. The main room is 40 x 90 feet, well lighted, and provided with heat. A movable partition is provided whereby this large room may be divided into two smaller ones, each large enough for all ordinary purposes. The live-stock work in the past has been very much handicapped by crowded quarters without heat or good light, but these difficulties are now past and the department is in a position to do much better work than before.

Farm Mechanics Building. A modern building has recently been completed for the Farm Mechanics work. It is an attractive, well-lighted brick building, having a large operating floor, a class room, locker room, shop, and tool room on the first floor. This operating floor is of cement and is roomy enough for demonstration and for the operation of the heavier farm machines. Within this place is reserved space for the very heavy farm tractors. A gallery surrounds this operating floor and provides space for the lighter farm implements such as tillage, haying, and harvesting machines.

The building is equipped with shafting, belting, and power for the operating and testing of the various machines, and a large well is provided for making pump tests. A very complete equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest; so that the student has constantly before him and is working with and studying the very best classes of farm machinery of all types.

Representative machines are found in the laboratory as follows: plows, harrows, pulverizers, cultivators, plant-setting machines, corn planters, potato planters, grain and grass seeders, mowers, rakes, binders, sprayers, manure spreaders, potato diggers, wagons, etc. Among the power machines are stationary gasoline engines, various types of pumps and pressure water systems, feed grinders, gasoline tractors, steam tractors, gang plows, farm lighting plants, and complete threshing machines. All of this expensive equipment is available to students in Farm Mechanics in the regular and short- course work.

The Poultry Houses. On a five-acre tract of land, lying south and west of Cauthorn Hall, there have been erected several buildings especially planned for the needs of the department of Poultry Husbandry. The main poultry building is a three-story structure and is used principally for class, laboratory, and demonstration purposes. It contains a demonstrating room with desks and other necessary equipment; a shop, with the necessary tools, benches, and equipment for practice work in building poultry-plant equipment; storage rooms, office, and wash rooms are also provided. In the basement, rooms are provided for fattening and killing fowls, an incubator room for student use, and a feed room with the necessary machinery for grinding and mixing poultry feeds. Besides the main poultry building there is an incubator house, with a capacity of twenty-four incubators and complementary apparatus; and a feed-storage building and a brooding house. There are also colony houses for laying and breeding stock and growing chicks. The colony houses are movable and constructed upon a plan that could be adopted by any farmer. The colony brooding coops are also portable, and are used for investigations in both natural and artificial brooding.

Hog Barn and Feeding House. During the fall of 1916 the Animal Husbandry department secured its long-needed hog barn and feeding house. The barn is designed especially for farrowing and contains twenty-nine pens, with a four-foot alley running the length of the building from east to west. Concrete is used for the entire floor, the feeding troughs, and the automatic watering equipment. The feed house is twenty-eight by forty feet in dimensions, three stories high. The ground floor is occupied by a driveway and entrance alley, root bin, two large grain bins, which extend through the second story, and a hopper for dumping grain into the elevator, which leads to the third floor. It provides also equipment for dividing, weighing, and loading pigs, as well as a small boiler for heating water. The second story provides room for the storage of straw, six smaller grain bins with hopper bottoms, and sleeping quarters for the herdsman. The third floor contains the grinder, motor, chutes to grain bins, and storage room for movable equipment. The total capacity of the building is 15 tons of roots, 6308 bushels of grain and 40 tons of straw.

COLLEGE ORGANIZATIONS

One of the most important factors in rounding out the results and benefits of a college course is the society, club, or association work. As a result of the diverse interests of college life and the varied tastes of the students, the following organizations, besides many others, are maintained by students and faculty:

The Student Body Assembly. This is an organization of the entire student body, working under a constitution and by-laws approved by the faculty, and having general authority over all student enterprises. In order to secure an effective administration of the business coming within its jurisdiction, there are permanent committees on athletics, publications, oratory and debate, and such special committees as the assembly may by vote determine. Officers are elected yearly, and nominations and elections are conducted in a manner similar to that of the State electorate.

Student Self-Government. A system of student self-government has been established at the College which places the general disciplinary powers of the institution in the hands of the students. The Student Council, an organization made up of thirteen students, seven of whom are seniors, three juniors, two sophomores and one freshman, has been created and vested with such powers as are necessary to enforce the rules and regulations adopted by the students. Members of the Student Council are elected annually by popular vote of the student body.

The Literary Societies. These organizations have the common purpose of promoting literary work among the students. The weekly literary programs and occasional joint meetings tend to this end. The Shakopean is essentially an honorary society, membership depending upon honors won in debate or oratory at the College. To stimulate interest in debate and oratory, there are held during the year intersociety, intercollegiate, and interstate contests. Gold medals and cash prizes are presented to the winners in the contests, and the successful society in debate receives the "Gatch Cup." This is the silver cup that was presented in 1901 by Dr. Thomas M. Gatch, then president of the College, to the society that had received highest honors in the season's debates. Annually this cup is to go to the successful society in debates, but it is ultimately to become the property of the society winning it three years in succession. Many and determined have

been the battles for its possession, but the cup is still without a permanent home.

The Christian Associations. The Young Men's Christian Association was organized in the Oregon Agricultural College as a part of the International Brotherhood in 1890. Since that time it has grown until it includes in its membership about one-fourth the men in the Student Body. The erection by the Y. M. C. A. of Shepard Hall, the student community building, which contains a swimming pool, reading, social, and game rooms, has greatly increased the scope and added to the effectiveness of the work. The Association aims to provide a high moral atmosphere and pleasant social advantages for its members and their fellow students. Members are trained in executive and committee service in work for their fellows and the community. Meetings are held in Shepard Hall each Tuesday evening; Bible, Mission, and social-study classes are regularly conducted; visitation committees call on students who are ill or disheartened; school boys of Corvallis are organized into clubs and Boy Scout patrols; regular socials are held in conjunction with the Women's Association; and extension work is conducted in vicinities near Corvallis. On registration days, committees are on hand to assist students in securing comfortable quarters in good homes and in adjusting their work satisfactorily. Those who make their way through College will find the employment bureau of the Association always ready and glad to assist them as far as possible in securing positions.

The Y. W. C. A. aims to cooperate with all the forces of the College in promoting among the women students a well-developed life. The rooms of the organization are located in Shepard Hall, the student community building. On registration days committees are appointed to meet incoming students and to help them in adjusting their work. Those who wish to earn their way through College will find the employment department ready and glad to assist them as far as possible in procuring positions. Weekly meetings are held in Shepard Hall on Thursday, and there is a Sunday Vesper service to which all women are welcome. Bible and Mission Study classes, social service work, socials and teas, all tend to make up the program for the year's work. Three-fourths of the women in College are members of the Y. W. C. A. and more than that number are enrolled in voluntary Bible Study.

The Athletic Association. This organization, maintained by the students through the student body assembly, encourages whole-

some competition in the various outdoor and indoor intercollegiate sports. It has charge of all details pertaining to the conduct of intercollegiate athletics in which the College may be interested. A committee of the faculty has general supervision over the whole subject of athletics, thus assisting to insure a sound and conservative management.

The Varsity O Association. This association, which succeeds the Orange O Club, includes all men of the College who have been officially awarded the Orange O in recognition of service on the intercollegiate athletic teams of the College. Its function is to promote the athletic ideals of the College and to serve in an advisory capacity to the Athletic Board of Control.

College Folk Club. This club was organized in October, 1908. Membership is open to all women of the faculty and other women employees of the institution, and to the women members of the immediate families of the faculty and other employees. The object of the club is social diversion, general culture, and the promotion of the best interests of the College and the community. The organization at this time is divided into three sections: Sociology Section, Mothers' Section, and Dramatic Section. Aside from the semi-monthly meetings of the various sections, the general club convenes on the first Saturday of each month, at which time an address is given by an outside speaker, or a musical or literary program is furnished by members of the club. In January, 1913, the organization became affiliated with the Oregon State Federation of Women's Clubs. It is the purpose so to extend the work of the club as to effect the greatest possible good to the College and to the city.

The Mask and Dagger. This club was organized for the purpose of offering special training in dramatic art. A semi-annual "try-out" is held in which all students of the institution may participate, and any who possess talent in this direction may be elected to membership in the club. No student, however, will be permitted to take part in a public production who has not an average for all of his College work, at the time the play is being prepared, of 75 percent. Platform exhibitions will be given and standard plays presented during the College year.

The Oratorical Association. This body has immediate charge of all business pertaining to the competitive work in oratory and

debate. Schedules, dates, prizes, conditions of competition, and all similar matters are in its care.

Intercollegiate Debate and Oratory. Each year the Oregon Agricultural College has three intercollegiate debates, putting into the field six teams, three supporting the negative and the others the affirmative of the same question. The College sends one representative each year into the old-line State Oratorical Contest in which eight colleges take part. Gold medals are awarded to the men who represent the College in these events. Each year also the College sends a representative to the State Peace Oratorical Contest, where two prizes of \$75.00 and \$50.00 respectively are awarded for first and second place.

Local Debate and Oratory. A local peace oratorical contest is held annually, to the winner of which the Cosmopolitan Club of the College presents a cash prize of ten dollars. There are also interclass contests in Declamation, Debate, Oratory, and Extempore Speaking, prizes being awarded by the Oratorical Association to the winners of these events. These latter contests are forensic events in the annual Interclass Forensic-Athletic Championship Contest, wherein the four classes compete for individual prizes and three loving cups—the Shakopean Cup, which becomes the permanent property of the highest individual forensic point-winner of the class winning the championship; the Orange O Cup, which becomes the property of the best athlete in that class; and the Barometer Cup, which is held one year by the class winning the interclass championship.

The Sphinx. This is the senior honor society. Membership is acquired by election based on prominence in student activities and excellence in scholarship.

The Forum. This society was organized by the junior and senior classes in the spring of 1914, its primary purpose being to recognize efficiency in scholarship among junior and senior students. Election is made to the society by its own members. The fact that high standards of general excellence have been set by charter members makes it a decided honor to any student to be elected to membership.

The Cosmopolitan Club. This is an organization of foreign and American students. It is a local chapter of the Association of Cosmopolitan Clubs of the World. Its purpose is to provide

social and educational advantages for its members and to promote international friendship. At present, eleven nations are represented in the local chapter.

The Agricultural Club. This club was established for the purpose of advancing interest in the various phases of agriculture, and promoting the investigation and discussion of both general and special agricultural subjects. Suitable programs are prepared for each meeting, and whenever practicable, leading authorities on practical agriculture are engaged to address the members.

The Lewelling Club. This is the Horticultural Club conducted under the auspices of the Horticultural department. There is no regular organization, except an executive committee, which has power to transact such business as requires action on the part of the club. It is open to all students interested in horticulture.

The Withycombe Club. Membership in this club is open to all students taking Animal Husbandry work. The meetings of the club are devoted to discussion of Animal Husbandry topics not ordinarily covered in formal class-room instruction.

Delta Theta Sigma. There is established at the College a local chapter of this national honorary agricultural fraternity. The aim of the society is to advance the study of agricultural subjects by giving honorable recognition to students taking the lead in this work. Elections to membership are made from the junior and senior classes by the members of the local chapter.

The Forest Club. This is an association of students and instructors "formed for the purpose of promoting the forestry interests of the State." In order to carry out its purposes, it meets twice each month. The first meeting of each month is purely of a social nature, with each alternate meeting for the discussion of current forestry literature, magazine articles, news items, legislation, and general progress movements pertaining to forests, forest service, forest products, forest industries, lumbering, and the lumber trade.

The Civil Engineering Club. This is an organization within the departments of Civil and Highway Engineering. The active membership is drawn from the junior and senior classes, and the privilege of associate membership is extended to the members of the two lower classes. It meets weekly for the discussion of subjects of interest to the civil and highway engineer.

The Electrical Engineers. This is a College branch of the American Institute of Electrical Engineers. The aim of the organization is to discuss the topics contained in the monthly proceedings of the A. I. E. E., and in this way develop in the student an intimate knowledge of the activities of the national organization, thereby coming into closer touch with the practical problems in the engineering world and becoming better fitted for their life work.

The Miners' Association. This body has for its object the discussion of technical engineering subjects; the review of current mining literature; the presentation of original papers by the active members; and occasional lectures on special mining topics by men outside of the College.

Mechanical Engineers. This is a College branch of the American Society of Mechanical Engineers. The purpose of the organization is to meet at regular intervals for presentation of technical papers by members and by practicing engineers. Current topics of interest to engineers are also discussed at these meetings and an effort is made to keep in touch with the practical problems of the engineering world.

Sigma Tau. This is a local chapter of the national honorary engineering fraternity, chapters of which exist at nearly all of the recognized technical schools of the United States. Membership in the fraternity is restricted to junior and senior students in Engineering and Forestry, election to membership being based principally upon excellence in scholarship.

The Home Economics Club. This is an organization for the purpose of bringing all the women of the School of Home Economics into closer touch with one another than is possible without a central organization. The aim of the club is to give, by a series of monthly meetings, a general survey of Home Economics questions not covered in regular class-room work. The aim is carried out by means of well-directed discussions and by securing outside lecturers who by virtue of their training and experience are considered authorities on subjects relating to Home Economics.

Theta chapter of Alpha Kappa Psi, a national fraternity devoted to the profession of Commerce, was organized during the school year of 1913-14. The purpose of the fraternity is to promote investigation along scientific lines in all phases of commercial

work. Membership is open only to students in the junior and senior year in the School of Commerce; and in order to become a member, the student must have shown himself a leader both in scholarship and in student activities.

The Commercial Club. This is a student organization within the School of Commerce. The purpose of the club is to bring its members into close relation with current methods and events in the commercial world. This is accomplished by discussions of topics pertaining to commerce by members of the club, and by addresses at various times during the year by prominent men in the fields of law and business. Active membership is open to all members of the School of Commerce.

The Pharmaceutical Association. The main purpose of this organization, which consists of the pharmacy students, is to bring its members into closer relation with the current events of the pharmaceutical world. This is brought about by discussions in the meetings of topics pertaining to pharmacy, and by addresses at various times during the year by prominent pharmacists and salesmen of the State.

The Easterners' Club. Membership in the Easterners' Club is open to all students and faculty people who have at any time resided in those states situated east of the Mississippi River, or in those provinces of Canada east of Manitoba. The objects of the club are to promote the interests of the College throughout the East, to encourage prospective students from the East and to offer social diversion to its members by providing occasions for the mingling of ideas on such current events as the sports and politics, which are represented by the various states included within the membership.

The Eastern Oregon Club. This is an organization effected for the purpose of promoting the mutual interests of the College and the people of the eastern part of the State. Its members are afforded many social and intellectual advantages from the regular club meetings. Membership is open to all students from Eastern Oregon.

The California Club and The Washington Club, are, as the names imply, composed of students whose homes are in California or Washington. It is for the purpose of bringing "Californians" and "Washingtonians" together socially that the clubs meet.

The Portland Club is composed of all of the students registering at the College from Portland, the primary object of the club being social diversion among those students who have been associated in their high-school work in previous years.

COLLEGE PUBLICATIONS

Two classes of publications are issued from the College; one official, published by the College authorities; the other, unofficial, published by the various student organizations.

The College publications include:

The Catalogue. The General Catalogue, published in the spring, contains much general and specific information as to the courses of study, equipment, and instruction, and gives a list of faculty members, and of students registered up to the time of publication.

The Bulletins of the Summer School. These announcements contain specific information of expenses, courses of instruction, character of the work presented, and the requirements that prospective students must meet.

The Bulletins of the Winter School. These announcements carry such information regarding the winter courses as may fully present the advantages of these courses to the public.

The Teachers' Exchange, a monthly periodical prepared by the department of Industrial Education and circulated in the interests of teachers of Industrial Arts.

Extension Bulletins. These bulletins consist of monographs on the various phases of Agriculture, Domestic Science and Art, Engineering, Mining, and Commerce, together with the bulletins and circulars issued in connection with the Industrial Club work for boys and girls in the public schools and the Home Cooperative Demonstration Projects. They are written in such style as to be easily understood, thus meeting the popular demand for scientific knowledge and giving it in such form that the people of the State may profit by its application to the problems of everyday life.

The Extension News, a monthly periodical devoted to items of timely information sent to citizens of Oregon on request.

The Station Bulletins. These publications include reports upon research problems and upon experimental investigations in agron-

omy, horticulture, drainage and irrigation, dairying, animal husbandry, poultry husbandry, insect pests, plant diseases, home economics, and special subjects of interest to the husbandman, conducted at the home station or the several branch stations.

STUDENT PUBLICATIONS

The student publications comprise:

The Barometer. In March, 1896, the literary societies of the College began the publication of a monthly periodical, the "O. A. C. Barometer." The enterprise has met with deserved success, and "the organ of the student body" is now issued as a four-page, six-column semi-weekly. It publishes the "news of the College," and is of general public importance as representing the interests, character, and accomplishments of the student body at the College. By action of the Board of Regents, resulting from a unanimous recommendation of the Student Body, a portion of the regular semester student fee of \$5.00 will be devoted to the "Barometer," and every student will regularly receive the paper.

The Beaver. This is the annual publication of the junior class, and made its initial appearance as "The Orange," in 1907. It is a high-class publication, substantially bound, and fully illustrated with photoengravings, pen and ink sketches, line and wash drawings. It is a full-dress carnival of the year's life, representing the dignity, the beauty, the versatility, the gaiety, the traditions, the sentiment, and the solidarity of the Oregon Agricultural College.

The Oregon Countryman. This is an illustrated monthly magazine, published by the Agricultural and Home Economics students under the supervision of the faculties of these courses. It is designed to be of special service to the farm home. Besides dealing with the work of the various College departments in a practical manner, it contains articles of scientific value contributed by the Experiment Station workers. Successful men and women of the State contribute articles for each issue.

The Student Engineer. This is a magazine devoted to engineering and mechanic arts. Its purposes are to record the engineering progress in the Northwest; to furnish news; to discuss methods relating to the mechanic arts; to publish records of scientific work done by the student in this institution; and to publish any matter of special technical and scientific interest. Items of interest

will be found for civil, mining, mechanical, and electrical engineers, for foresters and others engaged in technical pursuits. The journal is under the supervision of the faculties of the Schools of Engineering, Mining, and Forestry, but the work and responsibilities of the publication are borne by the staff, elected by the students of the school concerned.

The Commercial Print. This magazine, published each semester by the students of the School of Commerce under the supervision of the faculty of the school, is devoted to the commercial interests of the College and State. Articles of merit are contributed for each issue by students, faculty, and prominent business men of the State. One distinguishing feature of the magazine is the publication each semester of a complete directory of all the members of the institution, students, faculty, and employees.

The O. A. C. Alumnus. This is a quarterly periodical edited and issued for the Alumni Association by the Secretary of the General Alumni Association of the Oregon Agricultural College, whose office is at the College.

STUDENT EXPENSES

GENERAL FEES

Tuition is free to all students, regardless of the place of residence. The regular College fees, required of all students, with the exception of special students in music who take no other College work, are as follows:

Entrance fee, payable annually on registration.....	\$5.00
Incidental (Student) fee, payable each semester..	5.00
Diploma fee on graduation.....	5.00
Binding fee for graduation thesis.....	1.00
Vocational certificate fee.....	1.00

LABORATORY FEES AND DEPOSITS

Students are charged small fees in the different laboratory courses to cover the cost of material used; and deposits are required to cover cost of breakage in laboratory courses where breakages are likely to occur. These fees are payable at the beginning of each semester. At the end of the semester, deduction is made for actual breakage, and the balance of the deposit is refunded to the student. The fees and deposits charged each semester in the different courses are as follows:

Animal Husbandry:	Fees	Dep.
Courses A, 1, 16.....	.25	
Courses B, 2, 101, 102, 210, 220, 230, 240.....	.50	
Course E	1.50	

Art and Architecture:**Art**

Courses 102, 103, 204, 205, 206, 305, 306, 411, 412, 505, 506 .....	.50	
Courses 600, 601, 602, 603.....	1.00	2.00
Courses 413, 414.....	2.00	

Architecture

Courses 518, 533, 535, 536.....	.50	
Courses 601, 602, 604, 701, 702.....	.75	
Courses 537, 538, 603.....	1.00	

Bacteriology:

Courses A, 701.....	2.00	
Courses 103, 104, 201, 202, 205, 207, 208, 302, 304, 305, 401, 402, 501, 502.....	3.00	
Course 113	4.00	
Courses 112, 116.....	5.00	

Botany:

Course 37 .....	.50	
Courses 82, 83.....	.50 per credit	
Courses 22, 23, 30, 31, 69.....	1.00	
Courses 36, 41, 42, 47, 52, 67, 68, 70, 71, 101, 102, 104	1.50	
Courses 73, 75, 111, 116, 118.....	2.00	
Course 50	2.50	2.00

Chemistry:**All Laboratory Courses**

Fees.....	One dollar per credit hour
Deposits.....	Two dollars per course

Commerce:

Courses B, C, 100, 101, 102, 103, 107, 404, 405, 410 A, 416, 417.....	1.00
Courses 400, 401, 402, 403, 410, 411, 412, 413.....	2.00

Dairy Husbandry:

	Fees	Dep.
Courses 3, 4, A, B, C, D, P, 7.....	1.00	2.00
Course 6	1.00	
Course 12	1.50	1.50
Course 14	2.00	2.00
Course 30	2.00	
Courses L, M, 2, 10.....	.25	
Courses I, 5, 9.....	.50	

Domestic Art:

Courses 101, 102, 201, 202, 204, 601.....	1.00
Courses K, L, N, 203, 501, 502.....	.50
Courses 301, 701.....	1.50
Course 401	4.00
Course 404	3.00

Domestic Science:

Courses K, 150.....	.50
Course 120	1.00
Courses M, 110, 202, 210.....	2.00
Courses 180, 190, 191.....	2.50
Courses 201, 203.....	4.00
Courses H, I, 106.....	6.00
Course 107	7.00
Course 530	\$5.00 per week

Drainage and Irrigation:

Courses A, C.....	1.00	
Courses 1, 3.....	1.00	1.00
Courses 5, 7, 15, 19, 20.....	.50	1.00

Engineering:**Civil**

Courses 107, 111, 511.....	.50
Courses 222, 223, 225, 232, 235, 242, 243, 252, 254, 256, 272, 274, 513, 514, 515, 516, 555, 557..	1.00

Electrical

Courses 201, 202, 203, 204, 403.....	2.50	3.00
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Experimental

Courses 210, 238, 255, 262, 265, 272.....	2.00
Courses 201, 202, 203, 204, 205, 206, 207, 208, 225, 231, 232, 233, 235, 241.....	3.00
Courses 291, 292.....	Arrange

LABORATORY FEES AND DEPOSITS

55

Irrigation:	Fees	Dep.
Courses 204, 303, 305, 402, 501, 701, 802.....	1.00	
Mining:		
Courses 135, 137, 161, 171.....	1.00	
Courses 111, 112.....	3.00	
Course 401		20.00
Courses 212, 323.....		2.00
Courses 301, 324, 330, 423.....		5.00
Entomology:		
Courses 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312.....	1.00	
Farm Crops:		
Courses A, 1, 5, 9, 11, 13, 15, 19.....	.50	
Courses 23, 24.....	Arrange	
Farm Management:		
Courses 1, 11.....	1.00	
Courses A, 3, 7.....	.50	
Farm Mechanics:		
Courses A, 1, 9.....	1.50	1.00
Courses 3, 5, 13.....	2.00	1.00
Course 7	1.00	1.00
Course 15	2.00	
Forestry:		
Courses C, D, E, F, 205, 206.....	1.00	
Courses 201, 202, 203, 204, 304, 305, 307, 503, 507, 601, 606.....	1.50	
Courses 301, 303, 306, 308, 316, 317, 318, 501, 502, 506, 508, 604, 605.....	2.00	
Horticulture:		
Courses 201, 401.....	.50	
Courses A, B, 103, 104, 105, 127, 128.....	1.00	
Course 101 A.....	1.50	
Course 115	3.00	
Soils:		
Courses A, 5	1.00	1.00
Courses 1, 2, 3, 7, 15, 16.....	1.00	2.00
Courses 9, 13.....	.50	

Industrial Arts:	Fees	Dep.
Courses 106, 133, 202.....	1.50	2.00
Courses 152, 153, 228.....	1.50	
Courses G, 110, 111, 113, 116, 131, 132, 134, 138, 203, 206, 207, 208, 209, 212.....	3.00	2.00
Courses L, 151, 154, 155, 156, 158, 171, 173, 175, 270	3.00	
Courses C1, C2, C3, D1, D2, D3, E1, E2, E3, F1, F2, F3, T1, T2, T3, U1, U2, U3.....	6.00	2.00
Courses J1, J2, J3, K1, K2, K3, M1, M2, M3, N1, N2, N3, P1, P2, P3, Q1, Q2, Q3.....	6.00	
Courses 103, 104, 135, 136, 205.....	4.50	2.00
Course 174	4.50	

Industrial Education:

Courses 165, 167.....	1.50
Courses 164, 166.....	.50

Pharmacy:

Courses 130, 131, 140, 141, K, L, M, N.....	1.00	
Courses 118, 151, 170, E, F, Q.....	6.00	1.00
Courses 121, G.....	4.00	
Courses 160, 161.....	3.50	

Physical Education:

All courses	1.50
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(All students using the Gymnasium pay the fee of \$1.50 per semester, for which they are given use of all equipment, baths, and are furnished with towels, soap, and medical supplies for injuries.)

Physics:

All courses except 220.....	2.00
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Poultry Husbandry:

Courses 1, 2, A, B.....	1.00	1.00
Course 6		1.00

Veterinary Medicine:

Courses 3, 4, 11, 14, B, C.....	.50
Courses 2, 5, 6.....	1.00
Course 1.....	2.00

Zoology:	Fees	Dep.
Courses 106, 107, 120.....	.25	
Courses 110, 111.....	1.00	1.00
Courses A, 101, 102, 103, 108, 109, 114, 115, 116, 201, 202, 204, 207, 208.....	1.50	1.00
Courses 104, 105.....	2.00	3.00
Courses 112, 113, 205, 209.....		3.00

BOARD AND ROOM

Women's Dormitories. Waldo Hall and Cauthorn Hall, with their large airy parlors and halls, are pleasant residences for the young women who come from distant homes. The buildings are supplied throughout with pure mountain water, both hot and cold, electric lights, steam heat, and all modern conveniences. The rooms are furnished with an iron bedstead, a mattress, a chiffonier, a table, and chairs. Such other materials as are needed to make the furnishings complete, including pillows, pillow cases, sheets, blankets, bedspreads, and towels, are furnished by the student; and many of the students prefer to make the rooms more home-like by bringing rugs, curtains, pictures, sofa cushions, etc. These latter articles, however, are not at all necessary. The rooms are cheerful and comfortable without additional furniture. The bedrooms average about 12 feet by 15 feet, with one window 3 feet by 7 feet. Many of the rooms are larger, and a few of them have two windows. Most rooms are furnished with single beds, but a few double ones are available. There are a limited number of single rooms in each hall. Preference for single rooms should be indicated early. The many advantages of having a roommate should not be overlooked by the student in making her plans for college life.

The conditions of living in Waldo Hall and Cauthorn Hall are such that the College considers it a distinct advantage to the women students to live in these halls of residence. A wholesome, busy student atmosphere is maintained. Reasonable freedom is allowed, but week nights are reserved for study. All girls entering the College are expected to live in one of the dormitories, unless their parents reside in the city, or they are given special permission from the Dean of Women to live elsewhere. This permission must be obtained from the Dean of Women previous to registration.

The expenses of living for each student in the dormitories are as follows:

Room deposit	\$ 3.00
Room rent for each semester—	
Single room	20.00
Double room	10.00
Board per week, payable monthly in advance	3.50
Incidentals, such as laundry fee, electric iron fee, etc., for each semester.....	2.00

The room deposit of \$3.00 must be sent to the Registrar at the time of application for a room. When the student withdraws from College, this deposit will be refunded, upon presentation of the receipt, if no damage has been done to the room or furnishings.

Women students are not expected to arrive in Corvallis until the day the Halls are opened.

The dormitories will open for students September 16, 1917, the day preceding the first registration day.

Private Board for Men Students. No dormitory accommodations are available for men students. Board and room may be secured in private families in the city of Corvallis for from \$4.00 to \$5.50 per week. Good accommodations for self-boarding, or for club-boarding, can also be secured in the city. By clubbing, or renting rooms and boarding themselves, students materially reduce the cost of living. Students, however, will not be permitted to live at places not approved by the Faculty.

Lists of private boarding places can be secured from the Secretary of the Y. M. C. A. after the student arrives at the College.

PERSONAL EXPENSES

The personal expenses of students vary. Many students are able to go through the college year on a comparatively small income.

Questions of personal thrift, discrimination in values, and established habits are determining factors here. Each man, immediately upon registration, is required to supply himself with a military uniform, the cost of which will be approximately as follows: Suit and cap, \$11; leggins, 90c; hat band and breast cord, \$1.15; ornaments, 85c; gloves, 40c pair; total, \$14.30. Tan shoes (the regulation style, costing \$3.75) and a drab shirt (costing \$2.00) are appropriate elements of the uniform. The uniform

is very serviceable and is more economical than civilian clothing; with reasonable care, it should serve for two or more years.

In physical education women are required to provide themselves with a gymnasium suit, consisting of blouse-waist and bloomers of regulation style, and with regulation gymnasium shoes. Good second-hand uniforms of outgoing girls will be on sale for about \$4.00, while new uniforms cost \$5.00. These suits should be ordered at the gymnasium office at the time of registration.

Men in physical education are expected to supply themselves with a gymnasium suit and the regulation gymnasium shoes. The cost of the gymnasium uniform complete, including shoes, need not exceed \$2.75.

COST OF A YEAR IN COLLEGE

One of the most perplexing questions that confronts a prospective student is what the course is going to cost him a year. The necessary cost of a year at the College will vary slightly with the particular course pursued by the student. In general, it may be said that the necessary cost per annum, exclusive of the three personal items of clothing, carfare, and amusements, averages about \$224. An estimate of this average cost for the main expense items is given below. The cost for room and board is estimated at a safe average price. The board and room items are sometimes slightly reduced, where two students occupy the same room or where boarding clubs are economically managed.

Registration fee	\$ 5.00
Incidental (Student) fee	10.00
Laboratory fees and deposits.....	18.00
Textbooks and supplies	26.00
Board (for eight months).....	*128.00
Room rent (nine months)	36.00

In addition to the above, would be the cost to men of the military uniform and the regulation gymnasium suit, and to women of the gymnasium suit and shoes. Uniforms, however, as already indicated, should serve for more than one year. Personal expenses such as clothing, railroad fare, laundry, etc., vary greatly with the individual.

* On account of Christmas and other vacations which most students spend at home, the cost of board is estimated for eight months only.

It is not recommended that any student come to the College without sufficient funds available to purchase his books and college stationery for the entire semester, pay his first month's board and room rent in advance, and pay his first semester entrance fees. For the average student, this initial outlay will be approximately \$70.00, the balance of the annual expenses being distributed about evenly throughout the remaining months of the school year.

Persons desiring more detailed information on the question of expenses for students in various departments should write to the Registrar, Corvallis, Oregon, for a bulletin on "Student Expenses."

SELF-SUPPORT

A considerable number of students manage, in one way or another, to earn the whole or a part of their expenses while attending the college. Such opportunities occur in the line of office and laboratory assistance, personal services of numerous kinds, the management of various student enterprises, agencies for laundries, etc.

The Student Employment Bureau, in charge of the Young Men's and Young Women's Christian Associations, registers without charge all students who apply for employment. It is the purpose of the Bureau to try to supply work, regular or occasional, to all who need it. In general, the demand for work on the part of students exceeds the supply that the Bureau has available; therefore the attention of new students who intend to earn the whole or part of their living is called to the following results of past experience.

1. The applications received during summer will be given first attention; but no student should expect to be able to secure employment by correspondence.

2. There is a constant over-supply of those wishing to do teaching and clerical work. None but those having superior qualifications and experience are likely to secure employment the first semester.

3. There is a considerable demand for efficient stenographers; also for men and especially women students who can do domestic labor of any kind; board and room rent may be earned by table service, dish washing, general housework, house cleaning, gardening, etc.

4. Students who can do any kind of domestic or manual labor well, and who have thoroughly good health, can earn their board by three hours' work a day, or board and room by four hours' work a day. But no student should come to the College without resources sufficient for the expenses of one semester. (See "Personal Expenses.") Work of any kind is much more readily secured after the student has had opportunity of becoming familiar with local conditions.

5. No student should come expecting to earn money if he can do nothing well; skill is essential, as competition is quite as severe in the College community as elsewhere.

6. Opportunities for earning money during the summer vacations can usually be counted on, the demand for forest rangers, for field workers in engineering and mining, for skilled workmen in engineering shops, factories, canneries, and hop-yards, and for horticultural, farm, and forestry laborers, being most constant.

Upon arrival at the College, new students should report for information to the Information Bureau of the Young Men's and Young Women's Christian Associations.

Women students desiring work in the Dormitories should apply early to the Housekeeper of the Women's Dormitories.

The Dean of Women will be very glad to give any information to parents and prospective students about the work of the women at the College at any time. Office, Room 107 Home Economics Building.

HEALTH SERVICE

The College Health Service, inaugurated in 1916, is a department maintained with the aim of promoting the health of all the students. This aim is sought through medical examination, through consultation during office hours, through attendance of the Medical Adviser upon those in hospital and those ill at their residences, through sanitary inspection, and through supervision in case of epidemics. The services of the department, except in so far as the welfare of the College community may require, are not imposed upon any student or group of students. They are available, however, to all students who seek them voluntarily.

The department staff comprises a regular full-time physician, the Medical Adviser, who has his headquarters at the Health Service building, and a resident graduate nurse, who is in attendance at the same building.

The Health Service is maintained by funds derived from regular student fees, twenty-five percent of such fees being devoted to this purpose. The Medical Adviser may be consulted during office hours by any student. He will give medical examinations by appointment, and medical advice and attention to those who are ill. He will be in attendance at all important athletic events on the campus to render aid in case of emergencies. He will authenticate excuses from College work because of illness.

Patients who require hospital service will be attended, on request, by the Medical Adviser, as in other cases of illness; but will be responsible for all hospital fees. Patients requiring X-ray examinations of the Health Service will be responsible also for the cost of the X-ray pictures.

STUDENT LOAN FUND

Through the liberality of friends of the Oregon Agricultural College, and through the accumulation of interest on loans, an irreducible student loan fund aggregating \$7,100.00 (March 1, 1917), has been established. The purpose, as expressed by one of the donors, is "not to induce students to attend school by providing money that can be easily obtained, but rather to aid those who have determined to secure an education and are paying the cost wholly or in part from their own earnings."

The fund consists of the following contributions:

1. One thousand dollars (\$1,000) from Hon. R. A. Booth of Eugene, restricted to students studying:

- (a) Agriculture in its various phases, with a view to becoming producers from the soil.

- (b) Such branches of mechanics as properly relate to agriculture.

- (c) Home Economics.

2. Five hundred dollars (\$500) known as the Ashby Pierce Student Loan Fund.

3. One thousand dollars (\$1,000) from the Domestic Science Dining Room at the P. P. I. E., restricted to the use of women students.

4. Four thousand six hundred dollars (4,600), without restriction, from accumulated interest and from various College organizations, such as Folk Club, Philadelphian and Feronian Literary societies, the Barometer, the Oregon Countryman, the

Cosmopolitan Club, the Faculty, the Alumni, the Christian Associations, the Winter Short Course students of 1914, the Graduating Class of 1915, Chapter A. of P. E. O., Portland, and by various individuals including Mrs. Clara H. Waldo, Portland, Hon. Thomas Kay, Salem, Hon. James Withycombe, and W. D. Wheelwright.

L. J. SIMPSON SCHOLARSHIP LOAN FUND

Since that part of the Catalogue explaining the Student Loan Fund was printed, the College has received a gift of \$2,000 from Mr. L. J. Simpson of North Bend, Oregon, whereby five annual scholarship loans of \$100 each, continuing throughout the four years of the student's college course, will be awarded to worthy students whose needs justify the awards. The administration of the L. J. Simpson Scholarship Loan Fund is in the hands of the regular Student Loan Fund Committee, to whom applications should be made.

THE J. T. APPERSON AGRICULTURAL COLLEGE EDUCATIONAL FUND

By the will of the late Hon. J. T. Apperson, Regent of the College since its foundation, a fund amounting to between twenty-five and forty thousand dollars, is to be a perpetual endowment, administered by the State Land Board of Oregon, for the assistance of worthy young men and women, "who are actual bona fide residents of the State of Oregon, and who would otherwise be unable to bear the expense of a college course at the Oregon Agricultural College." The income from this estate is to be loaned to students at a low rate of interest. Applicants for loans must be recommended to the State Land Board by the President of the College and the State Superintendent of Public Instruction.

the other requirements for admission specified in the paragraph on Vocational Courses, under Entrance Requirements.

For Admission to the Degree Courses. By presenting properly certified evidence of the completion of four years of the course of study (15) units in high school, and by meeting the other requirements for admission specified in the paragraph on Degree Courses, under Entrance Requirements.

For Admission as a Special Student. By presenting properly certified evidence of suitable preparation for the studies desired,

The Health Service is maintained by funds derived from regular student fees, twenty-five percent of such fees being devoted to this purpose. The Medical Adviser may be consulted during office hours by any student. He will give medical examinations by appointment, and medical advice and attention to those who are ill. He will be in attendance at all important athletic events on the campus to render aid in case of emergencies. He will authenticate excuses from College work because of illness.

Patients who

... (\$1,000) from the Domestic Science Dining Room at the P. P. I. E., restricted to the use of women students.

4. Four thousand six hundred dollars (4,600), without restriction, from accumulated interest and from various College organizations, such as Folk Club, Philadelphian and Feronian Literary societies, the Barometer, the Oregon Countryman, the

Cosmopolitan Club, the Faculty, the Alumni, the Christian Associations, the Winter Short Course students of 1914, the Graduating Class of 1915, Chapter A. of P. E. O., Portland, and by various individuals including Mrs. Clara H. Waldo, Portland, Hon. Thomas Kay, Salem, Hon. James Withycombe, and W. D. Wheelwright.

PRIZE FUND

The Clara H. Waldo Prize of one hundred dollars is an award annually made in the proportions of forty, thirty, twenty, and ten dollars respectively, to the woman of highest standing registered as a regular student in one of the degree courses in the senior, junior, sophomore, and freshman year. In the distribution of the prizes, the committee having charge of the awards is guided by the following points:

- (a) Proficiency in literary and scholastic attainments.
- (b) Success in student activities.
- (c) Qualities of womanhood.
- (d) Qualities of leadership.

ADMISSION TO THE COLLEGE

A student who wishes to be admitted to the Oregon Agricultural College may do so in one of two ways: (1) by examination, (2) by certificate.

Students who seek admission by examination must present themselves for examination at the College on registration days, September 17 and 18.

Students who seek admission by certificate may do so in one of the following ways:

For admission to the Vocational Courses. By presenting properly certified evidence of the completion of the equivalent of an eighth-grade course of study in the public schools, and by meeting the other requirements for admission specified in the paragraph on Vocational Courses, under Entrance Requirements.

For Admission to the Degree Courses. By presenting properly certified evidence of the completion of four years of the course of study (15) units in high school, and by meeting the other requirements for admission specified in the paragraph on Degree Courses, under Entrance Requirements.

For Admission as a Special Student. By presenting properly certified evidence of suitable preparation for the studies desired,

and by meeting the other requirements specified under Special Students.

For Admission as an Optional Student. By presenting properly certified evidence of meeting all the regular entrance requirements to degree courses, and by meeting the other requirements specified under Optional Students.

For Admission to Advanced Standing. By presenting properly certified evidence of the completion, in other institutions of recognized standing, of such work as is equivalent to corresponding work required in the College courses, and by meeting the other requirements specified under Advanced Standing.

For Admission to Graduate Study. By presenting properly certified evidence of graduation from this or other educational institutions of equal rank, and by meeting the other requirements for admission specified under Graduate Study.

ENTRANCE REQUIREMENTS

Vocational Courses

For admission to the vocational courses in Agriculture, Dairying, Forestry, Home Economics, and Commerce, applicants must be at least 18 years of age, and in addition to having completed the eighth-grade course of study, or its equivalent, must be of good moral character. For admission to the vocational course in Mechanic Arts, applicants must be at least 16 years of age, and in addition to having completed the eighth-grade course of study, or its equivalent, must be of good moral character. Applicants who have not completed the eighth-grade course of study, but who are 21 years of age or over, and of good moral character, may be admitted to any of these vocational courses at the discretion of the dean of the school in which the work is to be carried on. For admission to the vocational course in Pharmacy, applicants must be at least 18 years of age, and in addition to having completed two years of high-school work, or its equivalent, must be of good moral character. For a statement of the length and character of the vocational courses, see index on Courses of Study.

Degree Courses

Applicants for admission to the degree courses must be 16 years of age or over and of good moral character. The fifteen units required for entrance, distributed in the most advantageous

way for admission to the various College courses in Agriculture, Home Economics, Forestry, Engineering, Mining, Industrial Arts, Commerce, and Pharmacy, are indicated in the table entitled "Prescribed Units for Admission." If the distribution of units presented by the matriculate does not correspond to that recommended, as indicated by the table, the student will be required to carry in College the courses lacking in his secondary credits, in order to make up his deficiency.

A unit, as referred to in the table, implies one high-school subject carried for five 45-minute periods a week throughout the school year.

Prescribed Units for Admission	Agriculture	Home Economics	For. & Log. Engineering	Engineering*	Commerce	Pharmacy
English	3	3	3	3	3	3
Mathematics—						
Algebra	1	1	1½	1½	1	1
Plane Geometry	1	1	1	1	1	1
Solid Geometry	0	0	0	½	0	0
Electives	10	10	9½	9**	10	10
Total units	15	15	15	15	15	15

The electives listed in the table may be selected from any of the subjects offered in the "Oregon Course of Study" for high schools.

While History and Foreign Languages are not prescribed by the College as entrance requirements, students are urged to pursue these subjects in the high school. For credit involved in this work, see Advanced Standing.

To be admitted as a conditioned freshman, a student must not lack more than two of the total number of entrance units.

In English. Admission to the English courses of the freshman year is by certification from accredited secondary schools. When an applicant cannot furnish such certification, his admission to the

* Includes Mining and Industrial Arts.

** It is suggested that while physics is not prescribed as an entrance requirement in Engineering, students who are preparing to enter any of the Engineering courses take a year's work in high-school physics where this work is available.

freshman courses is conditioned on his passing an examination in essentially the following tests:

1. To test his power of written expression, he will write one or more compositions on a subject, or on subjects, suggested by his personal, school, community, or literary interests.

2. To test his power of oral expression, he will read at sight, in the presence of the Examiner, passages of prose, or of poetry, or both, with accuracy and effectiveness. He will also be expected to talk intelligently in good English, on some assigned subject adapted to his ability.

3. To test the range and character of his reading, and his power of appreciation, he will be expected to answer a number of simple questions on standard classics and contemporary literature not previously prescribed. He will also be expected to explain the meaning of several passages of prose and of poetry of moderate difficulty, selected from books not previously prescribed.

Whether the applicant be admitted by certification or by examination, the English department will, whenever it deems such a course advisable, deal with the student as in a probationary relation.

In case the work of such student should, at the expiration of thirty days after matriculation, fail to conform to the standard set for creditable freshman work, he may be required to make up his deficiencies in English.

Candidates presenting exercise books containing compositions or other written work properly certified to by the instructor, will be given credit for such work.

In Mathematics. The entrance requirements in Mathematics for students entering any of the degree courses in College; namely, one unit in Algebra and one unit in Plane Geometry, will be satisfied by the applicant's ability to pass a satisfactory examination in the following topics:

- (a) In Algebra, addition, subtraction, multiplication, and division of positive and negative numbers; use of parentheses, factoring, highest common factor, lowest common multiple, fractions, fractional and literal equations, simultaneous equations, problems involving linear equations with one or more unknown numbers, graphical representation of simultaneous linear and quadratic equations, involution, evolution, theory of exponents, radical expressions.

(b) In Plane Geometry, the five books of Wentworth's Plane Geometry, or any other standard text on the subject. That the student may be trained to think for himself and not be dependent upon the published proofs of the text, much importance is based upon the proving of original exercises. It is distinctly advised that students preparing for entrance examination in Geometry devote considerable time to the study of original exercises.

The entrance requirements in Mathematics for students in the schools of Forestry, Engineering, and Mining demand an additional semester's work in Algebra, including quadratic equations, problems involving quadratic equations with one unknown number, equations in the quadratic form, factoring of quadratic equations, solution of quadratic equations by factoring, simultaneous quadratic equations, problems involving simultaneous quadratic equations with two unknown numbers.

The entrance requirements in the School of Engineering demand also, in addition to the specifications above, one semester's work in Solid Geometry, such as that presented in Wentworth's Solid Geometry, or any standard text on the subject.

ACCREDITED SCHOOLS

Pending the preparation of a classified list of high schools by the Oregon State Department of Public Instruction, students who have completed four years of high-school work will be admitted to the degree courses on presentation of a signed statement of the principal, showing work completed. It is recommended that the Certificate of Record blank issued by the Oregon Agricultural College, be used. Copies will be sent by the Registrar on the application of either student or principal. These blanks must be filled out and signed by the principal or other authorized official of the school. The certificate, so authenticated, should be filed with the Registrar of the College on or before September 11, 1917. Certificates will not be rejected at a later date but acknowledgment of the receipt of such certificate will be made by the Registrar up to and including September 11 only. Students sending certificates at a later date will likely be delayed in completing registration.

SPECIAL STUDENTS

Students who have presented satisfactory evidence of suitable preparation for the studies they desire, who are 18 years of age,

and of good moral character, may be admitted as special students, provided they have never applied for admission and been rejected.

Special students may be allowed to graduate in any of the courses, on condition that they complete the required work.

Special students are expected to select their studies from courses open to freshmen. If they desire to take studies to which only advanced students are regularly admitted, they must show some special preparation or special necessity for such courses.

Candidates applying for admission on the above basis should file with the Registrar before September 11, 1917, a detailed statement of their preparatory work.

OPTIONAL STUDENTS

Students who have presented satisfactory evidence of meeting all the entrance requirements for the freshman class, who are of mature years and of good moral character, may be admitted as optional students, provided they furnish satisfactory evidence that they are unable, because of poor health, or outside business, or professional duties, to take a full course. They should file with the Registrar, before September 11, 1917, a certified statement of all preparatory work.

ADVANCED STANDING

Students matriculating in the degree courses with more than the number of credits required for entrance to the freshman class, will be given advanced standing for such credits as represent work beyond the full four years high-school course, that is, work taken in the graduate year, and are equivalent to the requirements of the course in which the student matriculates.

No credit will be allowed for any Science or Foreign Language carried for less than one full year.

ADMISSION FROM OTHER COLLEGES

Any student who has attended another college or university and desires to enter the Oregon Agricultural College, should file with the Registrar, on or before September 11, 1917, an official certificate from the college from which he wishes to transfer, giving evidence of: (1) his honorable dismissal; (2) a detailed statement of the entrance credits presented at the time of his matriculation at the other college; (3) a detailed statement of

the work pursued while in attendance at that college; and (4) a marked copy of the catalogue of the institution, showing by conspicuous markings the courses which he completed.

REGISTRATION

All candidates for admission should file with the Registrar a certificate of their preparatory record on or before September 11, 1917. Certificates of preparatory work will not be rejected at a later date, but applicants cannot expect to receive formal acknowledgment of their receipt by the Registrar. Applicants sending in their certificates late may be delayed at registration time. Blank forms for such records may be secured from the Registrar. Such candidates should present themselves for registration at the College on September 17 or 18, 1917. Registration at a later date will be permitted only on presentation of a satisfactory reason for the delay.

Students who have not before registered at the College are advised to reach Corvallis not later than September 15, 1917, in order that they may secure a boarding and rooming place before the first day of registration.

GRADUATION

The degree of Bachelor of Science in Agriculture, in Forestry, in Logging Engineering, in Home Economics, in Electrical Engineering, in Irrigation Engineering, in Highway Engineering, in Mechanical Engineering, in Mining Engineering, in Ceramic Engineering, in Chemical Engineering, in Commerce, in Pharmacy, and in Industrial Arts, is conferred upon those who have satisfactorily completed the respective four-years courses which in the aggregate comprise 136 credits of College work. A graduate in any of the courses receive the bachelor's degree in any other course by completing the studies required in that course.

The degree of Graduate in Pharmacy is granted to those students in Pharmacy who complete specified work meeting the requirements of the American Conference of Pharmaceutical Faculties.

A certificate will be granted those students who complete the Vocational Course in Agriculture, Dairying, Home Economics, Mechanic Arts, Commerce, or Pharmacy.

GRADUATE STUDY

The Oregon Agricultural College offers to its graduates and to those of other institutions of equal rank, work in Agriculture, Home Economics, and Pharmacy leading to the degree of Master of Science, and work in Engineering, Mining, and Forestry, leading to the usual professional degrees.

This work is done in the several departments of the College under the general supervision of a standing committee of the Faculty known as the committee on "Graduate Students and Advanced Degrees."

REQUIREMENTS FOR THE HIGHER DEGREES

Candidates for any one of the higher degrees will be required to complete a certain minimum of resident work, to prepare a suitable thesis, and to pass an oral examination.

The resident work is planned so that it may be completed in a single year by a student who devotes full time to his studies; it consists of a minimum of 32 credits, including the preparation of the thesis. Graduate credit from other institutions will not be accepted as reducing this minimum of 32 credits. One credit requires approximately three hours of the student's time each week for one semester. From 16 to 24 of these credits will be devoted to the thesis and to allied subjects in the same department, and will constitute the candidate's major. From 8 to 16 of these 32 credits will be selected from other departments of the College and will constitute the minor. Undergraduate work may, at the discretion of the committee, be taken as part of the minor, but when so taken, the number of credits allowed for any course will be reduced to two-thirds of the number listed in the catalogue, the assumption being that the candidate can, in work of that grade, accomplish as much in two hours as the average undergraduate in three. No course which is contained in the curriculum of any high school of the State of Oregon, nor any course regularly covered in the Freshman and Sophomore years of this College shall be allowed as credit toward an advanced degree; and no credit shall be allowed toward the major for any regular undergraduate course. All graduate students taking regularly announced courses must attend the examinations given as part of such courses.

The thesis must embody the results of investigative, though not necessarily original, research, and a typewritten copy of the thesis, prepared according to the specifications of the committee, must

be deposited with the chairman of the committee not later than two weeks prior to the date set for commencement of the year in which the degree is desired.

After the thesis has been deposited, the chairman will appoint a special examining committee and set a date for the oral examination. This special committee will consist of: (1) the one or more professors in charge of the major; (2) the one or more professors in charge of the minor; and (3) one or more members of the Committee on Graduate Students and Advanced Degrees. The report of this committee will be presented to the College Council by the chairman of the Committee on Graduate Students and Advanced Degrees. The chairman will deposit the thesis of successful students with the Librarian as soon as possible after the oral examination.

Higher degrees will be conferred only at the regular commencement exercises, but the committee may under exceptional circumstances allow the candidate to be absent from such exercises.

ADMISSION TO THE COLLEGE AS A GRADUATE STUDENT

All students who have been graduated from four-years courses in the Oregon Agricultural College or in other colleges of equal rank, will be considered graduate students and will be registered as such by the Registrar. Graduate students will be required to present credentials to the Registrar as specified under "Admission from Other Colleges."

FEES

Graduate students will pay the same entrance, incidental, diploma, and binding fees as undergraduates. Laboratory fees will in each case be determined by the head of the department concerned, and must be paid at the beginning of the semester in which the laboratory work is done.

SCHOOLS AND DEPARTMENTS

SCHOOL OF AGRICULTURE

ARTHUR BURTON CORDLEY, Dean

The School of Agriculture offers the following courses of study: a four-years course with various options, which leads to the degree of Bachelor of Science; a one-year course in General Agriculture; a one-year course in Dairying; and a four-weeks winter course in Farm Crops, Animal Husbandry, Dairy Husbandry, Horticulture, and Poultry Husbandry (known as the Winter Short Course).

The Degree Courses. The various degree courses in Agriculture are open only to those who have completed the equivalent of four years of the Oregon State high-school course (see Admission to the College). The aim of these courses is to train young men to become successful farmers, stockmen, and fruit growers; to equip them to become efficient managers of orchard and ranch properties and of agricultural cooperative organizations; to prepare them to become specialists in some branch of agricultural college or experiment station work, or to fit them to become teachers of agriculture in the public schools. In short, they offer to those who have faith in the farm and in rural life, opportunities for individual development and technical training equal to those provided for the educated in other professions.

The various subjects of instruction may be conveniently arranged into three groups, as follows:

(a) **Sciences related to Agriculture:** Botany, Zoology, and Entomology; Chemistry, Physics, and Bacteriology; (b) **Technical Agricultural subjects:** Farm Crops, Soils and Farm Management, Farm Mechanics, Rural Architecture, Irrigation and Drainage, Animal Husbandry, Dairy Husbandry, Horticulture, Poultry Husbandry, Veterinary Medicine; (c) **Non-technical subjects:** The English Language and Literature, Modern Languages, Political Science, Rural Economics, Rural Sociology, and similar subjects.

The subjects of the first group are designed to furnish the student with an insight into the principles of agricultural science. Those of the second group teach him the application of these principles and give him also, both theoretically and practically, various subjects of agricultural technology. The subjects of the third group tend further to develop the student's intellect, broaden his view, and train him in good citizenship.

To indicate briefly the nature of the work, it may be stated that the student studies the origin, structure, fertility, cultivation, and improvement of various soils; the history, growth, culture, improvement, and value of the different field crops; the structures, machinery, drainage, and irrigation of the farm; and the history, economics, methods, and business principles in farm management. Thorough courses in Business Administration, Rural Economics and Sociology, and Political Science for Agricultural students, are given by the School of Commerce. In the course in Animal Husbandry, consideration is given to the history and characteristics of the various breeds of live stock; the principles of breeding; the principles and practice of feeding, with particular reference to conditions in this State. By constant practice in stock judging, the student is made familiar with the good points of the various breeds. In Horticulture the student studies the problems of the orchard and garden, such as choice of sites, soils, planting, pruning, choice of varieties, sprays and spraying, and thinning; he obtains instruction and practice in the propagation of plants by various methods; in the harvesting, picking, storage, and marketing of fruits; he may study the principles of plant breeding, or the construction and management of greenhouses, or the culture of small fruits and vegetables for market or canning purposes. In Dairy Husbandry he studies the secretion, composition, and separation of milk and cream; and obtains abundant practice in the use of the Babcock and other tests, in butter and cheese making, and in creamery practice. A department of Poultry Husbandry offers to students exceptional opportunities to specialize in this line. The instruction will include a study of breeds, the principles of feeding, housing, and incubation, and will be supplemented by practical work on the farm. In Veterinary Medicine the student is taught to prevent disease, diagnose existing pathological conditions, arrest outbreaks of contagious and infectious diseases among domestic animals, give medical attention in emergency cases, and take care of the sick.

In response to the demand for special teachers of Agriculture in the high schools, an opportunity is given students to major in agricultural education. Certain courses are prescribed in the junior and senior years to broaden the general agricultural training of the first two years, so that the teacher may be prepared to meet the conditions in any section of the State. Courses in Pedagogy provide the necessary principles and methods of teaching.

Some election is also allowed in order that the student may specialize along the lines of his greatest interest.

Candidates for the degree of Bachelor of Science in Agriculture will pursue one of the two prescribed courses during the first two years.

Group I (See Page 75) prescribes the more work in technical Agricultural subjects and leads to the more advanced work in the departments of Animal Husbandry, Dairy Husbandry, Drainage and Irrigation, Farm Crops, Soils and Farm Management, Farm Mechanics, Horticulture, Poultry Husbandry, and Rural Architecture.

Group II (See page 76) prescribes the more work in Modern Languages and science and prescribes especially for the more advanced work in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology.

During the two remaining years of his course, each student is given the opportunity to specialize by electing major work in some one department. For graduation, sixty-six credits are required in addition to the freshman and sophomore work. Junior and senior courses other than those prescribed must be selected with the approval of the head of the department in which the major is taken.*

Students who prefer not to specialize, may, with the approval of the Dean, pursue a course in General Agriculture with a wide range of electives. Junior and senior courses aggregating not less than twenty-four credits are required in the School of Agriculture. The remaining courses may be taken in any of the schools or departments of the College.

Practical Experience Required for Graduation

Those students majoring in applied Agriculture will be required to have had a certain amount of practical experience, either before entering the institution or during vacation periods, before being granted a degree. The amount of practice work necessary will be determined in each case by the head of the department in which the student is majoring.

* Major work shall consist of not less than sixteen or more than twenty-four credits in any one department.

DEGREE COURSES IN AGRICULTURE

Group I.

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 100, 101).....	3	3
General Physics (Phys. 1).....	3	or 3
Agricultural Botany (Bot. 41, 42).....	3	3
Crop Production (Farm Crops 1).....	3	or 3
Stock Judging (A. H. 1).....	2	
* Farm Surveying and Leveling (C. E. 242).....	2	
Live Stock Management (A. H. 2).....		3
Library Practice (Libr. 1).....		½
Hygiene (Phys. Ed. 10).....		½
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	½	½
	<hr/> 17½	<hr/> 17½

Sophomore Year

Farm Accounts and Business Methods (Com. 109).....	2	
Principles of Economic Zoology (Zool. 108, 109).....	3	3
Agricultural Chemistry (Chem. 500, 501)	3	3
General Bacteriology (Bact. 103).....	3	or 3
Principles of Fruit Growing (Hort. 101 A).....	2	
Fundamentals of Land. Gard. (Hort. 101 B).....	1½	
Vegetable Growing (Hort. 201).....		1½
** Soils (1, 2).....	3	3
Elements of Dairying (D. H. 1).....		3
Practical Poultry Keeping (P. H. 6).....		2
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	½	½
	<hr/> 18½	<hr/> 17½

* Students who desire to specialize in the course in Farm Business and Rural Leadership will take Commerce 219 instead of C. E. 242.

** Students who desire to major in Animal Husbandry will take Breeds of Stock instead of Soils, taking Soils courses in the junior year.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Ins. 1, 2).....	1	1
Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Electives	13	13
	—	—
	16	16

Students majoring in General Agriculture or Agriculture for Teachers will follow Group I, electing not less than four nor more than six credits each semester in the major department. Other subjects must be elected with the approval of the Dean of the School in the case of students in General Agriculture and the Professor of Industrial Education in the case of students in Agriculture for Teachers.

DEGREE COURSES IN AGRICULTURE

Group II.

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 100, 101).....	3	3
General Physics (Phys. 1, 2).....	3	3
Principles of Economic Zoology (Zool. 108, 109).....	3	3
Modern Language (German, French, first year).....	3	3
Library Practice (Libr. 1).....		½
Hygiene (Phys. Ed. 10).....		½
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	½	½
	—	—
	16½	17½

	Semester	
	1st	2nd
Sophomore Year		
Agricultural Botany (Bot. 41, 42).....	3	3
Agricultural Chemistry (Chem. 500, 501).....	3	3
General Bacteriology (Bact. 103).....	3	or 3
Modern Language (German, French, second year).....	3	3
Organic Chemistry (Chem. 201).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	½	½
* Electives	5	5
	<hr/> 18½	<hr/> 18½

Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Ins. 1, 2).....	1	1
Electives	12	15
	<hr/> 17	<hr/> 17

Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Electives	13	13
	<hr/> 16	<hr/> 16

In the courses in this group students may major in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology. The purpose of these courses is to provide students with preliminary training for agricultural college and experiment station positions in these various sciences; for work in the scientific bureaus of the U. S. Department of Agriculture; for positions as fruit inspectors; and for technical positions in State and government fish and game propagation work.

Students who desire a less technical course may, with the approval of the Dean, substitute elective work for any one of the prescribed courses in each semester of the freshman year. These

* Students majoring in Agricultural Chemistry take Qualitative Analysis, 3 credits first semester and Quantitative Analysis, 5 credits second semester.

and other elective courses may be taken in any of the schools or departments of the College, provided only that in addition to the prescribed courses not less than twenty-four credits of junior and senior work must be taken in the School of Agriculture.

Vocational Courses. The one-year vocational courses are not preparatory or elementary courses. They are provided especially for those who desire to obtain as quickly as possible a working knowledge of the principles of agricultural practice. They are open to young men with or without high-school preparation, and to men of mature years and practical experience, who may desire to familiarize themselves with the most modern thought on this subject. Those who pursue the one-year course in Agriculture will have the opportunity of specializing in general farm practice, live-stock husbandry, horticulture or poultry husbandry; and those who pursue the one-year course in Dairying will have the opportunity of specializing in Dairy Production or Dairy Manufacturing.

In this State there are thousands of young men who are to become our future farmers and orchardists. It is to the interest both of the individual and of the State that these young men should keep pace with the rapid development of agriculture. Each and every one should have, if possible, the opportunity of obtaining an agricultural education. Many of these young men are so situated, however, that it is impossible for them to attend any of our regular four-years courses. There are also many mature men well past the usual school age, no doubt, who desire to acquaint themselves more fully with the more recent developments in agricultural science and practice. It is to meet the needs of such men, both young and old, that these one-year courses are offered. They are designed to provide the largest amount of practical information and training that can be given in one year.

VOCATIONAL COURSE IN AGRICULTURE

	Semester	
	1st	2nd
* Elementary Vocational English (Eng. G).....	3	
* Advanced Vocational English (Eng. H).....		3
Farm Accounting (Com. E).....		3
Business and Social Organization (Com. I).....	3	
Woodwork (Shop G).....	2	
Blacksmithing Shop (Shop L).....		2
Farm Soils (Soils A).....	3	
Farm Crops (Farm Crops A).....		3
Agronomy (Optional)—		
Farm Machines and Engines (Farm Mech. C).....	3	
Practical Farm Drainage (Dr. and Irr. A).....		2
Irrigation Farming Practice (Dr. and Irr. C).....	2	
Animal Husbandry (Optional)—		
Stock Judging (A. H. A).....	2	
Feeding and Management (A. H. B).....		5
Elements of Stock Feeding (A. H. E).....	2	
Diseases of Domestic Animals (V. M. C).....	2	
Horticulture (Optional)—		
Horticultural Practice (Hort. A, B).....	5	5
Poultry Husbandry (Optional)—		
Practical Poultry Keeping (P. H. A, B).....	3	3
** Drill (Military A, B).....	1	1
** Gymnasium (Phys. Ed. 11, 12).....	$\frac{1}{2}$	$\frac{1}{2}$

* Students who have a satisfactory knowledge of English may elect an equivalent amount of other work.

** Mature men may be excused from Military Drill and Gymnasium work.

ANIMAL HUSBANDRY

ERMINE LAWRENCE POTTER, Professor
EDWARD BLODGETT FITTS, Assistant Professor, (Extension)
GEORGE ROY SAMSON, Assistant Professor
ORAN MILTON NELSON, Instructor
DALE EVERETT RICHARDS, Instructor
Instructor

The course in Animal Husbandry is planned to fit the student for the actual raising of live stock on the farm, so that he may produce the highest grade of stock in the most economical and business-like manner. The student is thoroughly grounded in the underlying principles in order that he may successfully continue his study after leaving college, but the practical details are thoroughly treated and a special effort is made to keep the students in close touch with the financial phases of the industry. Students who take this work as their specialty are expected not to devote their entire time to livestock; but, on the contrary, to familiarize themselves with crop production, soil fertility, and other phases of general agriculture. They are expected also to study English, Economics, Commercial Law, and kindred subjects, all of which are so essential in the training of the young man who expects to become not only an up-to-date business stockman, but a good useful citizen.

Students electing to major in Animal Husbandry must have had considerable practical experience in farming and stock raising before they will be allowed to graduate. The nature and extent of the experience required will be left to the judgment of the head of the department.

Students not majoring in Animal Husbandry but desiring to elect some work in the department, will be given careful attention to see that they get just the work fitted to their individual needs.

Equipment. The equipment of the department of Animal Husbandry consists essentially of live stock, barns, and the College stock farms. During the past year the live stock available for illustration and demonstration purposes has been very much improved in numbers and in quality. The College flocks and herds now include typical specimens of Shorthorn and Hereford cattle, Cotswold and Shropshire sheep, Berkshire, Yorkshire, Poland China and Duroc Jersey swine, Percheron, Belgian, Clydesdale, Shire, American Saddle, and Standard-bred horses, together with the live stock used in experimental work. In addition to the live stock regularly kept on the College farm, much good stock is

loaned from time to time by the leading breeders of the State. During the winter, carload lots illustrating the market classes are brought in for demonstration purposes. The department also possesses abundant maps, charts, lantern slides, stud books, a complete animal husbandry library, and other equipment for the conduct of laboratory, lecture, and recitation work.

The department has just completed what is considered the most convenient and modern hog barn in America. This building will aid materially in the instructional and experimental work with hogs.

COURSES IN ANIMAL HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

	Semester	
	1st	2nd
Junior Year		
Advanced Business Law (Com. 309, 310).....	3	3
Animal Chemistry (Chem. 509).....	2	
Comparative Anatomy (Vet. Med. 1).....	3	
Comparative Physiology (Vet. Med. 2).....		3
Soils (Soils 1, 2).....	3	3
Forage Crops (Farm Crops 9).....	2	
Drill (Military 5, 6).....	1	1
Animal Nutrition (A. H. 7).....	2	
Feeds and Feeding (A. H. 21).....		4
Military Science (Theo. Inst. 1, 2).....	1	1
Elective		2
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Govt. (Com. 322).....		3
Diseases of Live Stock (Vet. Med. 3, 4).....	3	3
Principles of Breeding (A. H. 6).....		3
Advanced Stock Judging (A. H. 16).....	3	
Seminar (A. H. 18, 10).....	1	1
Live Stock Economics (A. H. 110).....		3
English or similar elective.....	6	3
	16	16

The following courses are offered:

1. Stock Judging. The various types of farm animals are studied by score card and comparative methods, and the student made familiar with the desirable and undesirable types of beef and dairy cattle, sheep, swine, and horses.

Agriculture; freshman year; first semester; 2 credits; 3 laboratory periods. Fee \$0.25. Text: Vaughan, Type and Market Classes of Live Stock.

2. Live-Stock Management. Practical details of the care and management of live stock, stabling, grooming, sanitation, practical feeding, and kindred details of live-stock farming, all with especial reference to Oregon conditions.

Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50. Text: Potter, Live Stock Management.

6. Principles of Breeding. The principles of breeding as related to the development of our domestic animals; variation, transmission of variations and modifications, fecundity, inbreeding, crossing, and like topics.

Prerequisites: Botany 41 and 42; Zoology 108, 109. Animal Husbandry; senior year; second semester; 3 credits; 3 recitations. Text: Walter, Genetics.

7. Animal Nutrition. The chemical and physiological principles of animal nutrition; the function of the various classes of nutrients when taken into the animal body; nutritive ratios; feeding standards; compounding rations; and the general significance of the chemical composition and energy value of feeds.

Prerequisites: Chemistry 500 and 501. Animal Husbandry and Dairy Husbandry; junior year; first semester; 2 credits; 2 recitations. Text: Henry & Morrison, Feeds and Feeding.

13. Research Work. The student is expected to select some line for individual investigation, either by library methods or otherwise. The object is: first, to allow the student to study some particular subject in which he is especially interested; and second, to give him training in working out problems for himself, such as he will have to undertake after leaving college. This course is open only to those who are taking Animal Husbandry as their major, or who have taken practically all of the regular courses in Animal Husbandry.

Animal Husbandry; elective; senior year; first semester; credits and hours to be arranged.

14. Research Work. A continuation of course 13.

Animal Husbandry; elective; senior year; second semester; credits and hours to be arranged.

16. Advanced Stock Judging. Practical judging of all kinds of live stock, with occasional trips to fairs and stock farms. Judging teams for the Pacific International Stock Show will be chosen for the most part from this class.

Prerequisites: At least four credits of stock judging. Animal Husbandry; senior year; first semester; 3 credits; four two-hour laboratory periods. Fee \$0.25.

18. Seminar. Weekly meetings in which papers on Animal Husbandry subjects are read and discussed. These papers are prepared under the supervision of the department, although considerable latitude is allowed in the selection of subjects and the manner of presentation.

Animal Husbandry; junior or senior year; first semester; 1 credit.

19. Seminar. A continuation of course 18.

Animal Husbandry; second semester; 1 credit.

21. Feeds and Feeding. An advanced course in the feeding of horses, beef cattle, sheep, and swine, consisting of a thorough training in the most approved methods of stock feeding. Especial study is made of the practices of the best stockmen, and of the investigations carried on by the various experiment stations. Students desiring to take only such parts of the course as relate to certain lines of live stock will be permitted to do so by arrangement with the head of the department.

Prerequisite: Animal Husbandry 7. Animal Husbandry; senior year; first semester; 5 credits; 5 recitations. Text: Henry and Morrison, Feeds and Feeding.

23. Feeds and Feeding. A condensed course intended for those students who do not have the time necessary for Courses 7 and 21. While brief, the work is complete in itself and does not depend upon any other course. The feeding of beef cattle, sheep, hogs, and horses is studied with reference to both principles of nutrition and farm practice.

Prerequisite: Animal Husbandry 2. Elective to juniors and seniors in all agricultural courses except Animal Husbandry; second semester; 3 credits; 3 recitations. Text: Henry and Morrison, Feeds and Feeding.

24. Pork Production. Feeding and Management of hogs with especial reference to dairy farm conditions.

Prerequisite: Animal Husbandry 7. Dairy Husbandry Elective; junior or senior year; second semester; 3 credits; 3 recitations.

101. Live Stock Practice. Laboratory studies devoted to such work as dipping, dehorning, hoof trimming, shearing, horse training, and other common operations of the stock farm.

Senior Animal Husbandry students only; first semester; 1 credit; 1 three-hour laboratory period. (Note.—The department reserves the right to limit the number of students in this course.) Fee \$0.50.

102. Live-Stock Practice. A continuation of Course 101.

Animal Husbandry; second semester; 1 credit; 1 three-hour laboratory period. Fee \$0.50.

110. Live-Stock Economics. An advanced course in management dealing particularly with the economic and financial phases of live-stock production.

Animal Husbandry seniors only; second semester; 3 credits; 3 recitations.

210. Types and Breeds of Horses. A study of the leading types and breeds of both light and heavy horses, beginning with the market grades and classes, followed by the breeds. Each breed is studied with reference to its early history, the environment under which developed, the foundation stock, the men who were instrumental in establishing the breed, subsequent development, and present status. Careful consideration is given to the leading families, or strains, and the most prominent animals, both in the country at large and in the Northwest. While the work is not entirely local in its application, especial effort is made to familiarize the students with the herds and the breeders with which they will come in contact when they engage in practical work after graduation. The lecture work is accompanied by comparative judging, in which particular attention is given not merely to the general merits of the animal, but to its conformity to the type or breed in question.

Prerequisite: Animal Husbandry 1. Animal Husbandry; junior year; first semester; 2 credits; 1 recitation; 1 three-hour laboratory period. Fee \$0.50. Text: Harper, Management and Breeds of Horses.

220. Types and Breeds of Beef Cattle. A study of the types and breeds of beef cattle as outlined under Course 210.

Prerequisite: Animal Husbandry 1. Animal Husbandry; junior year; first semester; 2 credits; 1 recitation; 1 three-hour laboratory period. Fee \$0.50.

230. Types and Breeds of Sheep. A study of the types and breeds of sheep as outlined under Course 210.

Prerequisite: Animal Husbandry 1. Animal Husbandry; junior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period. Fee \$0.50. Text: Plumb, Types and Breeds of Farm Animals.

240. Types and Breeds of Hogs. A study of the types and breeds of hogs as outlined under Course 210.

Prerequisite: Animal Husbandry 1. Animal Husbandry; junior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period. Fee \$0.50. Text: Day, Productive Swine Husbandry.

250. Breeds of Live Stock. A study of the breeds of horses and beef cattle, their development, breeding and type.

Prerequisite: Animal Husbandry 1 or A. Sophomore year; first semester; 3 credits, 2 recitations, 1 three-hour laboratory period. Fee \$0.25.

260. Breeds of Live Stock II. A study of the breeds of sheep and swine, their development, breeding, and type.

Prerequisite: Animal Husbandry 1 or A. Sophomore year; second semester; 3 credits; 2 recitations; 1 three-hour laboratory period. Fee \$0.25.

300. Pedigree Study. A laboratory study of the blood lines of the various breeds of live stock. Each student is expected to select one or two breeds as the basis for special study rather than to attempt to cover all breeds.

Animal Husbandry; elective; senior or graduate year; second semester; credits and hours to be arranged.

400. Advanced Hog Feeding. A study of experimental data relating to hog feeding problems.

Animal Husbandry; elective; graduate year; second semester; 2 credits; hours to be arranged.

411. Graduate Research. Graduate students will be given opportunity to carry on research work along any lines desired. The department is especially well equipped for graduate work

along the lines of experimental feeding of hogs, sheep, and beef cattle, live stock management, and all forms of library work with either experiment station or general live-stock literature.

Animal Husbandry; elective; graduate year; first semester; credits and hours to be arranged.

412. Graduate Research. Continuation of Course 411.

Animal Husbandry; elective; graduate year; second semester; credits and hours to be arranged.

A. Stock Judging. A thorough drill in the judging of beef cattle, sheep, swine, and horses, accompanied by text-book and lecture work on types and breeds of live stock.

Vocational; first semester; 2 credits; 3 laboratory periods. Fee \$0.25. Text: Vaughan, Type and Market Classes of Live Stock.

B. Feeding and Management. The practical details of the feeding, care, and management of all kinds of live stock, with special reference to practices common in the West.

Vocational; second semester; 5 credits; 4 recitations; 1 laboratory period. Fee \$0.50. Text: Potter, Live Stock Management.

E. Elements of Stock Feeding. The elementary principles of stock feeding, methods of balancing rations, feeding standards, and nutritive ratios.

Vocational; first semester; 2 credits; 2 recitations. Fee \$1.50.

BACTERIOLOGY

THEODORE DAY BECKWITH, Professor
GODFREY VERNON COPSON, Associate Professor
RALPH McBURNEY, Instructor

Bacteriology, although comparatively a new field of study, has become an every-day interest and has taken a place deservedly prominent among the sciences. It is essential that every student in Agriculture, Pharmacy, or Home Economics acquire at least a general knowledge of the fundamental principles of bacteriology in order to get a thorough understanding of his work.

Since technical bacteriology is usually a totally unfamiliar field to the new student, the first courses are necessarily general in character, although every effort is made towards direct application whenever possible. The work, therefore, is both theoretical and practical. Courses are commenced in the sophomore year to enable the student to continue along definite specialized

lines during the junior and senior years. This thorough preparation is given along certain specific lines in bacteriology, such as Soils, Dairying, Domestic Science, Pharmacy, Sanitation, etc. The advanced work undertakes from a bacteriological point of view the problems of the major work of the student, who is trained not only in technique, power of observation, and the principles of bacteriology, but also in power of resourcefulness, initiative, and individual responsibility.

For the proper understanding of bacteriology, it is necessary to have had at least a course in general chemistry, which is a prerequisite for all students except those in the vocational courses.

Equipment. The department of bacteriology is located on the fourth floor of the Agricultural building. It occupies two large laboratories for general class work, one for special soil bacteriology and a laboratory for combined Experiment Station and Research Work. In addition there are the offices of the members of the department, a small but well-selected library including most of the authoritative works on bacteriology, besides a good list of the leading American and foreign periodicals. A dark-room, well-equipped for work in photomicrography, a store-room and large incubator room with automatically controlled temperature, is furnished for student use. The department is well supplied with the highest grade microscopes, ample glassware, both precision and common, and lead-topped desks.

Individual wall lockers, cylindrical and square copper sterilizers, supplied with steam from the main heating plant, small and large hot-air sterilizers, a large steam-pressure, horizontal sterilizer, the latter arranged for "dry-steam" sterilization, are conveniently arranged in the general laboratory for the larger sections. Small incubators are used by the advanced students. For special work demanding an extraordinary degree of exactness, there is a large electrically controlled and heated incubator. Lead-topped tables with convenient drawers furnish ample working space. Hot water, which is supplied to all laboratories, is fed by the main water system from a large hot-water tank. Sinks are uniformly lead. A high-power centrifuge is used. All the other necessary minor equipment for work in bacteriology is at the disposal of elementary and advanced students.

Major Courses. The purposes of these courses is to train students for Agricultural College and Experiment Station positions; for work in the Scientific Bureaus of the United States Department

of Agriculture; for positions as Sanitary and Milk Inspectors with various State and City Boards of Health; as Laboratory Technicians for Health and Sanitary Boards and for Hospital Service; and likewise for testing laboratories for corporations, such as creameries, and producers of various food products.

COURSES IN BACTERIOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
* Electives	13	13
	—	—
	16	16

The following courses are offered:

103. General Bacteriology. A series of lectures, recitations, and experiments to familiarize students with the underlying principles of bacteriology as applied to everyday life, especially to agricultural problems; and to serve as an introduction to the more advanced courses in the subject.

Prerequisite: one year's work in chemistry. Agriculture, sophomore year; Pharmacy, junior or senior year; either semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

104. General Bacteriology. A course supplementing the lecture and laboratory work of Bacteriology 103.

Prerequisite: Bacteriology 103. Agriculture; elective; sophomore, junior, and senior year; second semester; 3 credits; 2 laboratory periods; 2 recitations or lectures. Fee \$3.00.

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

112. Advanced Bacteriology. Beginning with the first semester of the junior year, a student may elect bacteriology for the two semesters of that year, and continue advanced work through the two semesters of the senior year.

Prerequisite: Bacteriology 103. Agriculture; elective; junior year; first semester; 5 credits; 1 lecture; 2 recitations; 3 laboratory periods. Fee \$5.00.

113. Advanced Bacteriology. A continuation of course 112, the laboratory work familiarizing the student with special bacteriological apparatus and its use, and then proceeding with advanced work involving questions of pure science, as well as the application of bacteriology to professions and industries.

Prerequisite: Bacteriology 112. Agriculture; junior year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods. Fee \$4.00.

114. Seminar. A discussion of the most important literature on the subject.

Agriculture; seniors, juniors and graduates; 1 credit; 1 hour.

116. Research in Bacteriology. A thesis may be selected in this subject, beginning with the first semester, senior year, major bacteriology, and continuing through two semesters. The laboratory is thoroughly well equipped for research in agricultural, veterinary, domestic science, or pharmaceutical bacteriology. Work for the master's degree, either as a major or minor in the department, may be selected. The investigations are all outlined and conducted by the student in cooperation with the instructional staff of the department.

Prerequisite Bacteriology 112 and 113. Agriculture; elective; junior year; credits and hours to be arranged. Fee \$5.00.

205. Immunity and Vaccine Therapy. A study of the standard methods in vogue in the various immunity and therapeutic reactions, antitoxin formation, preparation and standardization of vaccines.

Prerequisites: Bacteriology 201, 202, or equivalents. Agriculture or Pharmacy; elective; senior or graduate year; time and credits to be arranged. Fee \$3.00.

302. Zymology and Ferments. An elective for students in Home Economics who desire a specialized course dealing with technical fermentations and microscopic structure of the yeast plant and other fermentation organisms; the preparation and manipula-

tion of special media designed for their growth; pure culture methods used in zymology, methods of laboratory testing of commercial yeasts, both for use in breadmaking and alcohol production, the bacteriology of salt-rising bread.

Prerequisite: Bacteriology 300 or equivalent. Home Economics, or for students of other courses of equivalent preparation; elective; junior or senior year; either semester; 2 credits; 2 laboratory periods. Fee \$3.00.

304. Home Economics Bacteriology. Deals with bacteriology in relation to home life. An introduction to the subject, therefore, is made along theoretical lines, with application to sanitation and household practices. Water supply, action of septic tanks, house sanitation, control and prevention of specific diseases, fumigation, vinegar making, methods of contamination of milk, canning, treatment of wounds, etc.

Prerequisite: one year of chemistry. In its structure, this course parallels Bacteriology 103, with application to the problems of Home Economics. Home Economics; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

305. Home Economics Bacteriology. Primarily for Home Economics students, in continuation of Bacteriology 304. Standard sanitary bacterial examination of water, milk, butter, cheese, meat, air, etc., certain simple clinical methods. Use and action of anti-septics and germicides.

Prerequisite: Bacteriology 304 or equivalent. Home Economics, or students from other departments with equivalent preparation; elective; junior or senior year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

401. Dairy Bacteriology. History of dairy bacteriology, physiology of bacteria, chemical reactions in dairy products due to bacteriological activities; standard methods of bacterial analysis of dairy products, methods of sanitation, disinfection, diagnosis of diseases and faults of milk, control of milk-borne epidemics, preparation of commercial health drinks such as Bulgarian milk, Yoghurt, etc., discussions of milk problems.

Prerequisite: Bacteriology 103. Agriculture; senior year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

402. Dairy Bacteriology. Continuation of Course 401. A detailed study of specific problems in dairy bacteriology, practice in

special technique and methods. Individual problems assigned, literature reviewed, and discussed. Course designed fundamentally to develop initiative and resourcefulness of student. Work adapted to particular needs of individual students as far as possible.

Prerequisites: Bacteriology 103 or 401; Chemistry 501 or equivalent. Agriculture; junior or senior year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

501. Agricultural Bacteriology. The history and development of bacteriology as applied to scientific agriculture, micro-organisms in relationship to soil fertility, the destruction of organic matter and humus formation, plant food requirements and bio-chemicals, of the decomposition changes supplying such food, soil nitrogen requirements, the nitrogen cycle, nitrogen fixation by legume bacteria, media for the isolation and growth of soil organisms, soil types from the bacteriological point of view, ammonification, nitrification, denitrification, nonsymbiotic nitrogen fixation.

Prerequisite: Bacteriology 103. Agriculture; senior year; first semester; 3 credits; 1 recitation, or lecture; 2 laboratory periods. Fee \$3.00.

502. Agricultural Bacteriology. A continuation of bacteriology 501. A detailed study of soil changes due to micro-organisms. The effect of liming, manuring, and various methods of tillage, irrigation, and drainage, the activities of sulfur and iron bacteria, cellulose digestion, reference work to certain government and station bulletins, followed by abstract writing of the same for class use and discussion.

Prerequisites: Bacteriology 103 and 501. Agriculture; senior year; second semester; 3 credits; 1 recitation or lecture; 2 laboratory periods. Fee \$3.00.

701. Poultry Disease Bacteriology. The bacterial consideration of the most common diseases of poultry, chicken tuberculosis, chicken typhoid, white diarrhoea, roup, and avian diphtheria; soil contamination, and other methods of disease transportation.

Prerequisites: Bacteriology 103, 104, or equivalent. Agriculture; junior or senior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00.

A. Vocational Dairy Bacteriology. This course includes the bacteriological studies of milk, butter, and cheese; examination of starters, efficiency tests of pasteurization, cooling, straining, centrifuging, etc., and the general sanitation and cleanliness of the dairy.

Vocational Dairying; second semester; 2 credits; 1 lecture; 2 laboratory periods. Fee \$2.00.

B. Preventive Medicine. A consideration of certain common diseases of the human body, their cause, path of entrance, path of exit, method of transmission, and preventive methods to be taken against them; domestic water supply, pure milk, the action of germicides and antiseptics.

Vocational Home Economics; first semester; 1 credit; 2 lectures or recitations.

BOTANY AND PLANT PATHOLOGY

HOWARD PHILLIPS BARSS, Professor
WINFRED McKENZIE ATWOOD, Associate Professor
WILLIAM EVANS LAWRENCE, Assistant Professor
MARION BERTICE McKAY, Assistant Professor
CHARLES ELMER OWENS, Assistant Professor
HOWARD SPURR HAMMOND, Instructor, Curator of Herbarium
HENRY CLARK GILBERT, Instructor
OTTO HERMAN ELMER, Instructor
CHARLES ROY STILLINGER, Instructor

The courses offered in this department aim not only to give the student a broad knowledge of plants, their structure both external and internal, their vital activities, their relationships to their environment and their natural classification, but also to impart such fundamental and practical information in regard to plants as shall form a strong foundation for the technical work in Agriculture, Forestry, Pharmacy, and Home Economics.

The general courses are so planned as to present the principles of botany from a genuinely scientific point of view, and then to show how the knowledge thus presented applies in a practical way to the problems which the students will meet in the life-work they have chosen. In order that the different needs of students pursuing different lines of work in the institution shall be met in the best possible way, separate sections are provided and the work in each section is planned with the particular interest and needs of that section in mind.

Technical and reference books are used mainly as an aid in correlating the facts brought out by the study of the actual plant specimens in the laboratory. Living plants are used wherever possible. Drawing is made an important feature of the laboratory work, because in order to draw accurately the students must observe closely.

Exceptional opportunities are afforded students who desire to specialize in botany or plant pathology. Well-equipped laboratories and the unusually favorable location for field study and collecting, offer an attractive inducement for those interested in advanced work. Special attention will be given to students wishing preparation for teaching economic biology or botany in the secondary schools, or the teaching of botany or plant pathology in Agricultural Colleges. Training is also provided for those who wish to enter the field of investigational work in Agricultural Experiment Stations, or in the United States Department of Agriculture under the Civil Service. Agricultural extension workers, horticultural inspectors, district agriculturists, seed analysts, and pure-food experts will find special training in Botany and Plant Pathology a most valuable asset.

Equipment. The Department of Botany and Plant Pathology occupies quarters on the second floor of the Agricultural Building at the south end. There is a lecture room provided with projection lantern. There are three general student laboratories well equipped for botanical work, compound and dissecting microscopes being provided for each student. The work in plant physiology is conducted in a laboratory provided with individual lockers and equipment for each student. The laboratory is well supplied with apparatus for general course work and for special investigation, including accurate analytical balances, coarse balances, muffle furnace, electrical ovens, apparatus for the study of the respiration of fruit, meteorological instruments, chemicals, laboratory glassware, reagents, etc. Greenhouse facilities and a dark room for experimentation are also provided. The library room contains a large number of volumes of American and foreign reference works relating to botany and plant pathology, complete sets of important scientific periodicals, increased yearly by the current numbers, and a rapidly growing collection of bulletins and papers of interest to workers and students in the department. A large room is set apart for an herbarium and here accommodation is provided for students in taxonomic botany for the rapid drying and mounting of pressed plants. In the advanced laboratory a number of desks are available for special and graduate students and the equipment for advanced work in plant histology and microscopic technique includes a large electric paraffin bath, microtomes of different types, stains, chemicals, and glassware. For advanced students in plant pathology there is available an unusually well-equipped experi-

mental laboratory, provided with thermostatic incubators, refrigerator, inclosed culture room, transfer case, electrical dry-air sterilizer, horizontal autoclave, and steam sterilizers connected with the central steam plant. There is also a photomicrographic apparatus and an excellent equipment for photographing ordinary specimens in the laboratory or in the field. A suitable photographic dark room is provided.

For demonstration and lecture purposes, the department possesses an excellent set of charts and models, a large collection of lantern slides, photographs, and illustrative material. A museum exhibit of botanical and plant-disease specimens of great value and interest has been got together and is easily accessible to all students.

The surroundings of the Institution are particularly favorable for botanical study. On the campus are planted an interesting variety of trees, shrubs, and ornamental plants from various parts of the world, while a great diversity of economic plants are propagated on the College farm. The country about Corvallis furnishes an interesting variety of topographic features and provides within easy distance the flora of the hill and valley, plain and mountain, meadow and forest. Of interest to students in plant pathology is a small corner of the College farm which has been set out with a great variety of fruits for the study of plant diseases.

The permanent equipment of the department includes an herbarium of flowering plants and gymnosperms of many thousand specimens which contains, in addition to Oregon forms, quite extensive collections from New Mexico, California, Washington, and Michigan. The herbarium is being rapidly enlarged, particular attention being paid to the accumulation of economic material, including the forage and shade trees of North America, agricultural plants, pharmaceutical plants, weeds and grasses. The cryptogamic herbarium includes several thousand specimens of fungi from North America and Europe, being particularly rich in parasitic forms.

COURSES IN BOTANY AND PLANT PATHOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

	Junior Year	Semester	
		1st	2nd
Agricultural Economics (Com. 219).....		3	
Drill (Military 5, 6).....		1	1
Military Science (Theo. Inst. 1, 2).....		1	1
* Electives		12	15
		—	—
		17	17
Senior Year			
National Government (Com. 320).....		3	
State and Municipal Government (Com. 322).....			3
* Electives		13	13
		—	—
		16	16

The following courses are offered

22. Botany for Home Economics Students. The fundamental principles of botany. Growth, reproduction, structure and physiological activities in higher plants. A concise survey of the entire plant kingdom. The relations of plants to their environment, their importance in nature and their usefulness to man. Plants and plant products used as foods and food materials or employed in the manufacture of home furnishings and textiles.

The course in Home Economics; freshman year; first semester; 2 credits; 2 lectures; 1 laboratory period of two hours. Fee \$1.00. Text: Curtis, Nature and Development of Plants.

23. Botany for Home Economics Students. Continuation and completion of work outlined under course 22.

Prerequisite: course 22. The course in Home Economics; freshman year; second semester; 2 credits; 1 lecture; 1 laboratory period of three hours. Fee \$1.00. Text: Curtis, Nature and Development of Plants.

30. Forest Botany. Provides the basis for an adequate understanding of the forest and of the underlying principles of forestry. The structure, reproduction, and physiology of seed plants. The

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

microscopic study of wood. The identification of trees and shrubs in their winter condition. The characteristics and relationships of the four great plant groups. An introduction to the identification of higher plants. Continued throughout the year.

The course in Forestry; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$1.00. Text: Gager, Fundamentals of Botany. Stevens, Plant Anatomy.

31. Forest Botany. Continuation and completion of work described under course 30. Prerequisite: Botany 30. The course in Forestry; freshman year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$1.00. Text: Gager, Fundamentals of Botany. Stevens, Plant Anatomy.

36. Range and Pasture Botany. Study and identification of native plants of importance for forage and pasturage and native hay, and of the stock-poisoning plants, their distribution and localization. Of interest to students of Forestry, Animal Husbandry, Dairy Husbandry, and Veterinary Science.

Prerequisite: Botany 30 and 31 or 41 and 42, or their equivalent; elective; first semester; 3 credits; 1 lecture; 2 laboratory periods. Fee \$1.50. Text: Piper and Beattie, Flora of the Northwest Coast.

37. Forest Pathology. The parasitic and saprophytic fungi which attack forest trees and destroy structural timber; the effect of these organisms upon the wood, and a consideration of preventive measures.

Prerequisites: Botany 30 and 31, or 41 and 42. The course in Forestry; sophomore year; elective for others; second semester; 1 credit; 1 lecture; 1 laboratory period. Fee \$0.50.

41. Agricultural Botany. The fundamental principles of botany underlying agricultural practice. The structure, physiology, and development of higher plants from the seed to the flower. The structure and development of fruits, grains, fleshy roots, and tubers. A survey of the plant kingdom from its lowest to its highest forms with special emphasis on the groups of agricultural importance. Particular attention directed to food plants, stock-poisoning plants and the organisms causing disease in plants. A brief systematic study of agricultural and other economic plants with practice in identification. Continued through the year.

The course in Agriculture; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$1.50. Text: Curtis, Nature and Development of Plants.

42. Agricultural Botany. Continuation and completion of work outlined under course 41.

Prerequisite: course 41. The course in Agriculture; freshman year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$1.50. Text: Curtis, Nature and Development of Plants.

50. Plant Physiology. An introductory course in experimental Plant Physiology designed to impart a knowledge of the life-processes of the plant as a basis for intelligent agricultural and horticultural practice. Plant nutrition, growth, and response to environment. The functions of the living cell, the intake by the plant of water and raw materials from the soil. The transportation of materials through the plant. The loss of water. The manufacture, digestion, and assimilation of food, and the process of respiration.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70, and in addition, Chemistry 500 and 501. The course in Pomology; the course in Farm Crops; and the course in Botany or Plant Pathology; junior year; elective for others; second semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$2.50. Deposit \$2.00. Text: Duggar, Plant Physiology.

52. Advanced Plant Physiology. Special studies of plant physiological problems of present-day interest and importance. Extensive reading and class reports on selected topics. Methods of investigating scientific literature emphasized.

Prerequisite: Botany 50. Elective; first semester; 3 credits; 1 lecture; 2 recitations; (additional credits may be taken by special arrangement). Fee \$1.50.

67. Economic Ecology. The relations between the environment and the plant. The factors affecting the distribution of plants, and the occurrence of plant associations and successions. Ecological problems of the forest, grazing range, and farm. Field studies in physiographic ecology, including the methods of plant survey.

Of interest to the student of botany, forestry, grazing, agricultural economics, irrigation and drainage, plant introduction, geology, and to all who expect to enter State or Government field service.

Prerequisites: Freshman Botany, and Botany 36, 47, or 68. Elective; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$1.50. Text: Cowle's Ecology.

68. Classification of Flowering Plants. Native Oregon flowers and common cultivated ornamental plants. Collecting, identifying, pressing, and mounting of specimens by each student.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70; elective; second semester; 3 credits; 1 lecture; 1 laboratory period; and 1 field excursion for Saturday morning. Fee \$1.50. Texts: Piper and Beattie, *The Flora of the Northwest Coast*. Gray, *Field, Forest and Garden Botany*.

70. Pharmaceutic Botany. A fundamental, preparatory course for Pharmacognosy and Materia Medica. A brief survey of the plant kingdom. A careful study of the structure of higher plants. The cell and cell contents. Various types of plant tissues. Work in elementary pharmacognosy with training in the microscopic identification of drugs and drug adulterants. In the spring practice is given in the identification of drug plants. Continued through the year.

The course in Pharmacy; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$1.50. Texts: Youngken, *Pharmaceutical Botany*. Greenish, *Food and Drugs*. Mansfield, *Histology of Medicinal Plants*.

71. Pharmaceutic Botany. Continuation and completion of work outlined under course 70.

Prerequisite: Botany 70. The course in Pharmacy; freshman year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods. Fee \$1.50. Texts: Greenish, *Foods and Drugs*. Youngken, *Pharmaceutical Botany*. Mansfield, *Histology of Medicinal Plants*.

73. Plant Evolution and Structure. The evolution of form, structure, and methods of reproduction for all groups of plants. Evolutionary tendencies and homologies of structure and function. An advanced course dealing with fundamental principles. The detailed examination in laboratory of selected types from the lowest to the highest groups of plants.

Prerequisites: Botany 22 and 23, 30 and 31, or 41 and 42, or 70. The course in Botany; junior or senior year; elective for others; first semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$2.00. Texts: Coulter et al, *A textbook of Botany*, Vol. 1, part 1. Coulter, *Evolution of Sex in Plants*.

75. Plant Histology. An advanced course. The structure, inclusions, activities, and methods of division of the plant cell; the development, structure, and adaptation to function of various

types of plant tissues. The preparation of temporary and permanent microscopic mounts, including fixation, dehydration, infiltration, sectioning, and staining.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70 and 71. The course in Botany or Plant Pathology; junior or senior year; elective for others; first semester; 3 credits; 1 lecture; 3 laboratory periods. Fee \$2.00. Text: Stevens, Plant Anatomy.

80. Seminar. Required of all graduate students in Botany and Plant Pathology. Reports on advanced botanical studies. Abstracts of articles of botanical or phytopathological interest appearing in scientific journals, experiment station publications, or the agricultural press.

Elective; senior year; first semester; 1 credit will be given undergraduates regularly attending the meetings and making satisfactory reports; 1 hour session.

81. Seminar. The same as course 80 for second semester.

Elective; senior year; second semester; 1 credit as above; 1 hour.

82. Research and Thesis. For students specializing in Botany and Plant Pathology. Investigation of special problems or taking up of advanced studies not included in regular courses.

Elective; senior year; first semester; 1 or more credits (to be arranged for with instructor). Fee \$0.50 per credit.

83. Research and Thesis. Work as outlined in course 82; second semester.

Elective; senior year; second semester; 1 or more credits. Fee \$0.50 per credit.

101. Principles of Plant Pathology. Disease in plants: the causes, symptoms, effects, methods of distribution, etc. The principles of plant-disease control. Disease resistance in plants. Quarantine and inspection. Detailed examination in the laboratory of representative examples from the different groups of plant parasites. A study of various types of plant diseases, their life-histories and their microscopic appearance.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70. The courses in Pomology, Olericulture, Farm Crops and Farm Management; junior or senior year; elective for others; Horticultural students are expected to enroll in section 1; Agronomy students in section 2; first semester; 2 credits; 1 lecture; 2 laboratory periods. Fee \$1.50. Text: Duggar, Fungous Diseases of Plants.

102. Diseases of Orchard and Small Fruits. The causes, symptoms, progress, and control of the important fungous, bacterial, and physiological diseases of orchard trees, and small fruits, with particular emphasis on those of importance in the Pacific Northwest. Laboratory study of specimens showing the effects of the parasite on the tissues of the host, and the microscopic appearance of the causal organisms. Frequent field excursions to demonstrate the characteristic results of different diseases under natural conditions.

Prerequisite: Botany 101. The course in Pomology; senior year; elective for others; second semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$1.50.

104. Diseases of Vegetable Crops. The causes, symptoms, progress, and methods of control of the important fungous, bacterial, and other diseases of truck and garden vegetables and fruits with particular attention to those which are serious in the Northwest. Careful laboratory study of typically diseased specimens with microscopic examination of the affected tissues and of the parasitic organisms. Field excursions.

Prerequisite: Botany 101. The course in Olericulture; senior year; elective for others; second semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$1.50.

105. Diseases of Field Crops. The causes, symptoms progress, and methods of control of the important fungous and bacterial diseases of cereals and other field and forage crops, with particular attention to those of importance in the Northwest. Typical examples of the diseases are studied in the laboratory. Microscopic examination of the affected tissues and of the causal parasites.

Taken simultaneously with Botany 101, Section 2. The course in Field Crops, junior year, and Farm Management, senior year; elective for others; first semester; 1 credit; 1 laboratory period.

111. Laboratory Methods in Plant Pathology. A training course in methods of investigation in plant pathology. Record keeping; care of collections; culture work; inoculation methods; photographic work, etc.

Prerequisite: Botany 101. The course in Plant Pathology; junior or senior year; elective for others; second semester; 2 credits; 1 lecture; 2 laboratory periods. Fee \$2.00.

113. Methods of Control of Plant Diseases. A lecture course on the special methods employed in the practical control of plant diseases, including the use of various fungicides for different types

of diseases; the time and methods of application; surgery; sanitation; crop rotation; the development of resistant varieties; soil disinfection; seed treatment, etc.

Prerequisite: Botany 101. The course in Plant Pathology; junior or senior year; elective for others; second semester; 1 credit; 1 lecture.

116. Advanced Plant Pathology. Special studies in the field and in the laboratory of plant diseases, plant disease problems, or parasitic fungi; designed to provide training and experience in phytopathological investigations, or to extend the student's knowledge of plant diseases beyond the limits attained by the introductory courses.

Prerequisite: Botany 101. The course in Plant Pathology; senior year; elective for others; second semester; 2 or more credits; 1 lecture; laboratory periods to be arranged with instructor. Fee \$2.00.

118. Mycology. The different groups of fungi; their structure; modes of reproduction; nuclear phenomena; phylogeny and classification, with particular attention to parasitic forms.

Prerequisite: Botany 101. The course in Plant Pathology; senior year; elective for others; first semester; 3 or more credits; two lectures; 2 or more laboratory periods. Fee \$2.00. Text: Stevens, *Fungi that Cause Plant Disease*.

Graduate Courses. Botany 51, 80, 81, 111, 113, 116, and 118 may be taken by graduate students as major or minor electives with full credit.

Opportunity will be given students to elect work in Economic Botany or Plant Pathology not offered in the above mentioned courses by registering in Botany 82 or 83, either as a major or minor subject. Students who elect Botany as a major must have completed the work, or equivalent, required in the freshman year of the Agricultural course.

Note: Any of the courses in Botany except 22, 23, 30, 31, 41, 42, 70, and 71, may be taken as minor electives by junior, senior, or graduate students in any course, upon consultation with the head of the department, provided the course to be elected is not regularly required in the course of study in which the student is registered.

DAIRY HUSBANDRY

ROY RALPH GRAVES, Professor
RALPH IRVING SCOVILLE, Assistant Professor
EDWARD BLODGETT FITTS, Assistant Professor (Ext.)
PAUL STANLEY LUCAS, Instructor
JAMES OBYE BECK, Instructor
HAROLD RAY TAYLOR, Assistant

Dairy Production and Dairy Manufacturing are the courses which the Dairy department offers.

Dairying is rapidly becoming the leading animal industry of the United States. The last census report shows that there are more than twenty million dairy cows in the United States and the annual value of their products is approximately six hundred million dollars.

Since the population of the country is rapidly increasing, as is also the per capita consumption of dairy products, it seems likely that the importance of the Dairy Industry will continue to advance.

The Pacific Northwest, on account of its even temperature and abundant growth of forage crops, is peculiarly adapted to dairying; and the rapid growth of this industry is creating splendid opportunities for young men in the various fields of dairying, such as the breeding of pure-bred dairy cattle, the management of dairy farms, and the management of creameries, cheese factories, and city milk plants. There are many other openings in government work, college work, and county advisory positions for those who do not care to enter the field of practical dairying.

The production and manufacturing courses are so arranged that the student may major in one course, and yet elect enough of the other course to enable him to have a working knowledge of that phase of the industry.

In the production work, it is the intention to give the student a thorough course in the breeding, feeding, judging, care, management, and diseases of dairy cattle.

In order to meet the needs of the industry and the demand for information, the department offers the following courses: A one-year course, designed to fit students for positions as operators of creameries and cheese factories or as managers of dairy farms. A winter short course in both Dairy Manufacturing and Dairy Production. The four-years course, designed to qualify students for agricultural college and experiment station work; for inspectors of dairy products and dairy establishments in city, state,

or government service; or as managers of creameries or large dairy farms.

Equipment. The Dairy building, with its three floors and its newly remodeled manufacturing facilities, affords convenient and modern resources for the work of this department. In the manufacturing work, it is the intention to give the student theory and practice in the manufacture of dairy products. Commodious quarters are provided for this department in the Dairy building. The equipment is such as to permit handling milk and cream on a commercial scale, thus giving the student practice under actual factory conditions. On the first floor, are the offices and manufacturing rooms, the latter including a boiler room equipped with a 15 H. P. internal furnace boiler and a 10 H. P. Jewel automatic steam engine; a farm butter-making room, in which are found hand churns, butter workers, and the various types of separators found on the market; a churn room, which is equipped with modern ripeners, combined churns, various forms of butter-molding appliances, refrigerating machine, cooling room, and ice-cream freezer; a cheese room, which is equipped with cheese vats, automatic pressure cheese press, and other equipment used in the cheese factory; a cheese curing room; and a reading room.

On the second floor, are located recitation rooms, and advanced and general laboratories. The latter will accommodate one hundred twenty students in sections of forty each, and are equipped with a full line of appliances for testing milk and milk products. In the advanced laboratory, will be found moisture tests, salt tests, curd tests, and various other forms of apparatus suited to the needs of the advanced student. A circulating hot water system connects the wash sinks in all of the laboratories. Both steam and electricity are used for power purposes.

The College dairy herd consists of sixty-one head of choice dairy cattle of the Guernsey, Jersey, Holstein-Friesian, and Ayrshire breeds. These cattle are housed in a modern dairy barn.

COURSES IN DAIRY HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

One-Year Course in Dairying

	Semester	
	1st	2nd
Elementary Vocational English (Eng. G).....	3	
Advanced Vocational English (Eng. H).....		3
Dairy Accounting (Com. D).....		3
Dairy Mechanics (Ind. Arts 228).....	1	or 1
Dairy Mechanics (F. M. 7).....	1	or 1
Testing Dairy Products (D. H. A.).....	2	
Vocational Dairy Bacteriology (Bact. A).....		2
Drill (Military A. B.).....	1	1
Gymnasium (Phys. Ed. 11, 12).....	½	½

Dairy Manufacturing (Optional)—

Butter Making and Factory Management (D. H. B) ..	4	
Cheese Making (D. H. C).....		4
Ice Cream (D. H. D).....	2	
Judging Butter and Cheese (D. H. H, I).....	1	1
Creamery Practice (D. H. E, F).....	2	2
Special Creamery Tests (D. H. P).....		2
Breeding, Feeding and Management Dairy Cattle (D. H. J, K *).....	2	2*
Judging Dairy Cattle (D. H. L, M *).....	1	1*

Dairy Production (Optional)—

Diseases of Dairy Cattle (Vet. Med. A, B).....	2	2
Farm Crops (Farm Crops A).....		3
Judging Dairy Cattle (D. H. L, M).....	1	1
Breeding, Feeding and Management Dairy Cattle (D. H. J, K).....	2	2
Dairy Practice (D. H. N, O).....	1	1
Farm Soils (Soils A).....	3	
Blacksmithing (Ind. Arts L), and Wood work (Ind. Arts G), and Live Stock Management (A. H. 2) Elective.		

* Second semester of Breeding, Feeding, and Management of Dairy Cattle and Judging Dairy Cattle are optional.

Degree Courses in Dairy Husbandry

(a) Dairy Production

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Forage Crops (Farm Crops 9).....	2	
Animal Nutrition (A. H. 7).....	2	
Genetics (Zool. 120).....	3	
Comparative Anatomy (Vet. Med. 1).....	3	
Animal Chemistry (Chem. 509).....	2	
Comparative Physiology (Vet. Med. 2).....		3
Herd Management and Milk Production (D. H. 2).....		5
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives	1	6
Junior Seminar (D. H. 21).....		1
	—	—
	18	17

Senior Year

National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Dairy Bacteriology (Bact. 401).....	3	
Breeds and Breeding of Dairy Cattle (D. H. 5).....	3	
Diseases of Live Stock (Vet. Med. 3, 4).....	3	3
Advanced Testing (D. H. 14) (Elective).....	2	
Dairy Farm Equipment and Inspection (D. H. 6).....	2	
Buttermaking and Factory Management (D. H. 3).....		5
Senior Seminar (D. H. 8).....		1
Advanced Judging (D. H. 10) (Elective).....	1	
Approved Electives		4
Dairy Research (D. H. 30) (Elective)		
Market Milk (D. H. 12) (Elective).....	3	
	—	—
	16	16

(b) Dairy Manufacturing

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Forage Crops (Farm Crops 9).....	2	
Animal Nutrition (A. H. 7).....	2	
Business Organization and Management (Com. 110).....	3	
Genetics (Zool. 120).....	3	
Dairy Chemistry (Chem. 502).....		3
Buttermaking and Factory Management (D. H. 3).....		5
Milk Production and Herd Management (D. H. 2).....		5
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Advanced Testing (D. H. 14).....	2	
Approved Elective		1
Junior Seminar (D. H. 21).....		1
	17	17

Senior Year

National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Cheesemaking (D. H. 4).....	4	
Dairy Bacteriology (Bact. 401).....	3	
Breeds and Breeding of Dairy Cattle (D. H. 5).....	3	
Ice Cream and Ices (D. H. 7).....		2
Dairy Mechanics (Ind. Arts 28).....		1
Dairy Mechanics (F. M. 7).....		1
Seminar (D. H. 8).....		1
Butter and Cheese Judging (D. H. 9).....		1
Market Milk (D. H. 12).....	3	
Dairy Farm Equipment (D. H. 6) (Elective).....	2	7
Electives		7
	16	16

The following courses are offered:

1. Elements of Dairying. The secretion and composition of milk, and the causes of variation in composition; brief discussion of dairy cattle, and the factors in milk production; the Babcock test applied to milk and other products; use of the lactometer; the various methods of creaming; the operation of cream separators; the care of milk and cream; making butter under farm conditions. The general principles of cheesemaking; marketing of milk; dairy by-products; statistics and economics of the dairy industry.

Laboratory. The use of the Babcock test applied to milk and dairy products, with special attention to conditions that may affect the accuracy of tests; use of the lactometer; churning and working butter; a study of the construction, operation, and efficiency of various makes of cream separators; practice in ascertaining the yield of milk and fat, and the cost of production of cows in the College herd.

Required in all courses in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$2.00.

2. Dairy Herd Management and Milk Production. Form and its relation to production; difference in the efficiency of dairy cows; improvement of dairy herds; methods of testing and record keeping; the use and importance of the pure bred dairy sire in grading up the herd. **Care of the Dairy Herd:** care of the cow at time of parturition; the dairy calf and its successful development; developing the dairy heifer; care of the bull; feeding for economical milk production and for records. Registered dairy cattle and their management, fitting for the show ring, advertising cattle, and **Dairy Farm Economics:** the preservation and saving of manure; labor; crop systems for the dairy farm, soiling, pasturing, feeds; silage crops and the making of silage; the organization and purpose of cow-testing, bull, and community breeders' association. **Milk Production:** the production of market and certified milk; sources of infection and contamination of milk; the effect of different kinds of feed on flavor and healthfulness of milk; pasteurization of milk; contracts between milk companies and drivers.

Laboratory. Judging dairy cattle; scoring animals by breed and general score cards and judging classes of animals. Animals of the College herd will be used; and trips to local dairies, and an annual trip to prominent dairy farms in the Willamette Valley will be taken by College classes.

Prerequisite: Animal Husbandry 7. Required in courses in Dairy Production and Dairy Manufacturing; junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$0.25. Text: Eckles, Dairy Cattle and Milk Production.

3. Buttermaking and Factory Management. The composition of milk and cream; the effects of condition of milk and cream on the quality and yield of butter; pasteurization; starters; ripening and churning cream; packing and marketing butter. The location, organization, and construction of creameries; creamery refrigeration and management; creamery accounting; and other studies designed to fit the student to manage and operate creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; the use of starters; churning, with special attention to factors that control the composition of butter; packing and wrapping butter; the use of acidity, moisture, and salt tests.

Prerequisites: Dairy Husbandry 1, Bacteriology 101. Required in courses in Dairy Production; senior year; second semester; in course in Dairy Manufacturing; junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00.

4. Cheesemaking. The importance of quality and composition of milk in the manufacture of cheddar cheese; composition and characteristics of common American and European cheeses; ferments and fermentations and their control; factory management and construction; the making of cheddar cheese and some forms of soft cheeses.

Laboratory. Practice work in receiving and sampling milk; the use of the various tests for acidity, ferments, fats, solids, and casein; the making and curing of cheddar and other varieties of cheeses; the computation of yields, cost of manufacture, and profit; the effect of different methods of manufacture on yield and quality.

Prerequisites: Dairy Husbandry 1, Chemistry 502. Required in course in Dairy Manufacturing; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Van Slyke and Publow, Principles and Practice of Cheesemaking.

5. Breeds and Breeding of Dairy Cattle. The origin, history, and development of breeds of dairy cattle, their distribution

and their characteristics. A study of the breeding of the principal families of the various breeds. Application of the principles of Genetics to the breeding of dairy cattle.

Laboratory. Practice in the use of the breed herd books in tracing and making pedigrees. A study of methods of registering animals and advanced registry systems.

Required in courses in Dairy Production and in Dairy Manufacturing; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50.

6. Dairy Farm Equipment and Inspection. The arrangement and construction of modern dairy buildings with regard to convenience and sanitation; the various types of dairy barns, silos, milk houses, manure pits, liquid manure cisterns, and septic tanks; the essentials in construction and installation of dairy equipment, such as stall ties, milking machines, separators, coolers, sterilizers, and various utensils.

Laboratory. Practice in score-card inspection of dairy barns and milk rooms. Drawing of plans for dairy barns, silos, manure pits, milk houses, and covered sheds.

Prerequisite: Elementary Bacteriology 101. Required of Dairy Production seniors; elective for Dairy Manufactures seniors; first semester; 2 credits; 1 lecture; 1 three-hour laboratory period. Fee \$1.00.

7. Ice Cream and Ices. A study of the preparation, packing, and marketing of ice creams, sherbets, and related frozen products.

Laboratory. Practice in selecting and aging of cream for ice cream; standardizing and preparing the mix for the various frozen products; the freezing, packing, bricking, molding, coloring, and sale of the various frozen products; judging ice cream and related frozen products by the score card.

Required in course in Dairy Manufacturing; senior year; second semester; 2 credits; 1 recitation; 1 three-hour laboratory period. Fee \$1.00. Deposit 2.00.

8. Seminar. The study and review of new experiment station bulletins, and general dairy periodicals and literature. Papers are presented by the student on dairy subjects. Practice is given in outlining investigational work.

Required of all seniors and advanced students majoring in Dairy Production and Dairy Manufacturing; senior year; second semester; 1 credit.

9. Butter and Cheese Judging. Judging of butter and cheese with score cards; discussion of defects of body and flavor.

Required in course in Dairy Manufacturing; senior year; second semester; 1 credit; 1 three-hour laboratory period. Fee \$0.50.

10. Advanced Judging. Practice in judging dairy animals. This work, which includes trips to fairs and breeders' farms, is especially for those who desire to try for the Dairy Judging Team.

Elective; senior year; first semester; 1 credit; 2 two-hour laboratory periods. Fee \$0.25.

12. Market Milk. City milk inspection; federal, state, and city regulations; classes of milk; chemistry and bacteriology of milk from the practical standpoint; the farm market milk retailer; the village milk plant; the city milk plant; the transportation of milk; pasteurization methods; study of methods followed, apparatus used, and division of labor in large milk plants. The laboratory work includes special tests of milk, scoring of milk exhibits and milk plants, and drawing of plans and equipment for buildings.

Prerequisite: Elements of Dairy (D. H. I). Optional in courses in Dairy Production, and required in Dairy Manufacturing; junior and senior years; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.50. Deposit \$1.50.

14. Advanced Testing. Application of the Babcock test; use of the lactometer in detecting adulteration; practical tests for the detection of preservatives, drug adulterations, and artificial colors; fat determinations of cheese, butter, evaporated milk, sweetened condensed milk, and ice cream; moisture tests of butter and cheese; salt, color, and casein tests of butter.

Prerequisites: Elements of Dairy (D. H. I), and General Chemistry (Chem. 100 and 101). Required in courses in Dairy Manufactures; optional in Dairy Production; senior year; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$2.00. Deposit \$2.00. Text: Van Slyke, Modern Methods of Testing Milk.

21. Seminar. Required of all juniors majoring in Dairy Production or Dairy Manufacturing. Second semester; one credit.

30. Research and Thesis Work. This work is offered for senior and graduate students majoring in Dairy Husbandry. Investigational problems are assigned that will give the student training and experience in experimental work.

Elective for seniors and graduate students; first semester; credits to be arranged. Fee \$2.00.

Research and Thesis Work. Effective for seniors and graduate students; second semester; credits to be arranged.

40. Dairy Herd Management. A course similar to D. H. 2, except that all laboratory work is eliminated.

Junior or senior year; second semester; 3 credits; 3 lectures.

A. Testing Dairy Products. The testing of dairy products by the Babcock test, with special emphasis on conditions affecting the results of the test under practical conditions.

Required in one-year dairy course in Dairy Production, and in Dairy Manufacturing; first semester; 2 credits; 2 laboratory periods. Fee \$1.00. Deposit \$2.00.

B. Buttermaking and Factory Management. The principles of creamery buttermaking; construction, management, and care of the creamery; a comparison of the various methods commonly used in the manufacture of butter in creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; churning and packing butter.

Required in one-year course in Dairy Manufacturing; first semester; 4 credits; 2 lectures; 2 laboratory periods. Fee \$1.00. Deposit \$2.00.

C. Cheesemaking. The commercial manufacture of cheddar cheese, covering the process in detail; a study of other varieties of cheese; factory management and construction.

Laboratory. Practice in making cheddar and other varieties of cheeses. Records are kept of the different operations to note their effect on the finished product.

Required in one-year course in Dairy Manufacturing; second semester; 4 credits; 2 lectures; 2 laboratory periods. Fee \$1.00. Deposit \$2.00.

D. Ice Cream. The preparation of mixes for various frozen products by different formulas; the freezing, packing, and sale of frozen products.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 1 three-hour laboratory period; 1 lecture. Fee \$1.00. Deposit \$2.00.

E. Creamery Practice. Work in the creamery, care of creamery machinery, repairing and cleaning apparatus, to familiarize the student with practical creamery work.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 2 three-hour laboratory periods.

F. Creamery Practice. Continuation of E; second semester; 2 credits; 2 three-hour laboratory periods.

H. Butter and Cheese Judging. Judging butter and cheese with score card; discussion of the defects of body and flavor.

Required in one-year course in Dairy Manufacturing; first semester; 1 credit; 1 three-hour laboratory period.

I. Butter and Cheese Judging. Continuation of H; second semester; 1 credit; 1 three-hour laboratory period. Fee \$0.50.

J. Breeding, Feeding, and Management of Dairy Cattle. The history and development of the dairy breeds; a study of the breeding of the principal families of the various breeds; the selection and use of the pure-bred dairy sire in grading up the herd; the practice of inbreeding, linebreeding, and crossbreeding in improving dairy cattle. Feeding dairy cattle for economical milk production; feeding for records; developing the dairy calf; developing the dairy heifer; care of the dairy herd; care of the cow at time of parturition; methods of testing and record keeping; care and handling of the bull; the organization and purpose of cow testing, bull and community breeders' associations; the construction of dairy barns, milk houses, manure sheds, and silos; practical problems.

Required in one-year courses in Dairy Production; first semester; 2 credits; 2 lectures.

K. Breeding, Feeding, and Management of Dairy Cattle. Continuation of J; second semester; 2 credits; 2 lectures.

L. Judging Dairy Cattle. Scoring animals by breeds and general score cards and placing classes of animals.

Required in one-year course in Dairy Production; first semester; 1 credit; 1 laboratory period. Fee \$0.25.

M. Judging Dairy Cattle. Continuation of L; second semester; 1 credit; 1 laboratory period. Fee \$0.25.

N. Dairy Practice. Practice in computing and mixing rations; tracing and compiling extended pedigrees; fitting animals for the show ring.

Required in one-year course in Dairy Production; first semester; 1 credit; 1 three-hour laboratory period.

O. Dairy Practice. Continuation of N; second semester; 1 credit; 1 three-hour laboratory period.

P. Special Creamery Tests. Advanced work in the use of the Babcock test. Short cuts and conveniences for rapid and efficient testing; rapid tests for adulterants and preservatives; curd, acidity, and sediment tests.

Required in one-year course in Dairy Manufacturing; second semester; 2 credits; 2 three-hour laboratory periods. Fee \$1.00. Deposit \$2.00.

DRAINAGE AND IRRIGATION

WILBUR LOUIS POWERS, Professor
Instructor

Courses in Drainage and Irrigation hitherto have dealt with these subjects largely from the engineer's standpoint; and the disposal of water from soil or distribution of water within the farm unit has been considered of such small concern as to require nothing but a brief and more or less superficial treatment. Reclamation development has progressed so far, however, that haphazard and loose practices are no longer considered profitable. If the reclamation projects are to pay for costly development, great care must be given to the location of tile or the distribution of water on the farm. The adoption of scientific methods of handling soils and crops under irrigation and drainage projects, is coming to be regarded as of paramount importance. With the further extension of state and federal aid to reclamation, there will be a greater demand for men who have a knowledge of how most successfully and economically to use water which the engineer's canals and reservoirs provide. These men must know the best time, amount, and method of irrigation, and the effects of irrigation upon soils and crops. They should also know the relations between soils, soil waters, and drainage, and understand how to locate and construct drains and treat the soil so as to secure the highest possible efficiency for each unit of tile employed.

In this course students combine practical and theoretical training received through lectures, laboratory exercises, and field experiments. The course offers opportunity for electing courses in general agriculture, economics, and other electives to give the student a broad training for modern irrigation farming, irrigation investigations, or the work of a drainage specialist.

Equipment. For the class of field work in Drainage and Irrigation, surveying instruments, tile, and ditching tools, weirs, flumes, hook gauges, water-stage register, electric pumping plant, etc., are available. Weather-recording instruments of different kinds supply equipment for the course in Climatology. A new laboratory fitted with desks, ovens, etc., will afford opportunity for studies of the movement and retention of irrigation water in soil, the effects of irrigation upon soils and crops, the effect of tile drainage upon soils of different types, their rate of drainage, etc. The experimental plots and field work in this course offer

exceptional opportunity to study drainage and irrigation under practical field conditions. On the College farm the students build weirs, measure water, lay out distribution systems, make cement pipe for laterals, and test pumping machinery. On the drainage plots, the rate of discharge is measured and the effect of drains and soil conditions on water table is studied. Students are required to lay out, level, set grade stakes, and actually lay the tile in some part of a drainage system on the College land.

COURSE IN DRAINAGE AND IRRIGATION *

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Irrigation Farming (Drain. & Irr. 3).....	3	
Climatology (Drain. & Irr. 5).....		2
Topographical Surveying (C. E. 243).....	2	
Agricultural Bacteriology (Bact. 501).....	3	
Principles of Plant Pathology (Bot. 101).....	2	
Introduct. Entomology (Ento. 301).....	2	
Land Drainage (Drain. & Irr. 1).....		3
Elements of Dairying (D. H. 1).....		3
Crop Improvement (Field Crops 15).....		3
Farm Power Machinery (F. Mech. 3).....		3
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
Approved Elective		1
	17	17

* In the sophomore year students specializing in Irrigation Farming are required to take Trigonometry (Math. 11, 3 credits, 1st semester), and Soil Physics (Soils 3, 4 credits, 2d semester), instead of Elementary Bacteriology (3 credits, 1st semester), and Elements of Dairying (3 credits, 2d semester).

Senior Year	Semester	
	1st	2nd
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Hydraulics (I. E. 101).....	2	
Hydraulic Lab. (Exp. E. 265).....	1	
Irrigation Institutions (Drain. & Irr. 9).....	2	
Soil Fertility (Soils 7).....	4	
Advanced Irrigation (Drain. & Irr. 15).....	2	
Advanced Land Drainage (Drain. & Irr. 7).....		3
Irrigation Management (Drain. & Irr. 21).....		1
Feeds and Feeding (A. H. 23).....		3
Dairy Herd Management (D. H. 40).....		3
Extempore Speaking (Eng. 104).....		2
Approved Electives	2	
	16	16

The following courses are offered:

1. Land Drainage. The history of drainage; road, field, and sanitary drainage on the farm; the different systems of drainage; methods of locating, installing, operating, and maintaining drainage conduits, cost, efficiency, and profits; the effects on crops and soil; laws governing. Lectures, notes, readings, and field work.

Elective; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Elliott, Practical Farm Drainage.

3. Irrigation Farming. Methods of obtaining, distributing, and conserving irrigation waters. Handling of different crops under irrigation. Cost and profits thereof, and duty of water in various districts of Oregon. Water rights and irrigation codes. Field and laboratory studies of irrigable qualities of different soils, laying out of irrigation systems.

Elective; junior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Widtsoe.

5. Climatology. Practical meterology; observing and recording local weather and forecasting; a study of the climate of Oregon and the effect of climate upon agriculture. Class room and laboratory work.

Elective; junior or senior year; second semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$0.50. Deposit \$1.00.

7. Advanced Land Drainage. A study of drainage problems and conditions in the field. The actual surveying, laying out, draughting of plans, estimation of cost, and installation of drainage systems at different points in the State, is required of students taking this course. A complete report of the organization of a drainage district is prepared by each class.

Prerequisite: Drainage and Irrigation 1. Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods (week end). Fee \$0.50. Deposit \$1.00.

9. Irrigation Institutions. A brief history of the development of water laws. Water rights and irrigation codes in the different states, particularly in the Northwest and Oregon. Appropriation, adjudication, and administration of water. Reclamation and other government and state land acts affecting irrigation development. Organization and administration of irrigation districts and projects, water users' associations, etc. Discussion of public questions relating to irrigation.

Elective; senior year; first semester; 2 credits; 2 recitations. Text: Chandler.

11. Irrigation Farming Elective. Special course for Irrigation Engineering students or other students who cannot take the regular course in Irrigation Farming the first semester. This course deals with the handling of irrigation water after it reaches the farm, and of the different crops under irrigation. The irrigable quality of different soils, the duty of water in various districts of Oregon, and water rights and irrigation codes from the standpoint of the farmer, are important features of the course.

Elective; junior or senior year; second semester; 2 credits; 2 recitations.

13. Irrigation Field Practice. This course is planned to add interest to irrigation farming and develop a practical knowledge of irrigation farming conditions. Careful records are to be kept of water used on different soils and crops and of the field obtained from definite areas. The work may be done during the summer months in connection with duties as ditch rider or other field agent. A report is required and work is to be outlined with the instructor in advance.

Prerequisite: Drainage and Irrigation 3. Following 2nd or 3rd college year's work; 1 to 3 credits.

15. Advanced Irrigation. Irrigation literature and methods of irrigation investigation. Field and laboratory studies of irriga-

tion experiments and calculation of depth of water applied and of the most economical production thereby secured. Costs and profits connected with irrigation are determined. Analysis of data and preparation of a report is required in this course. Field examinations will be made, where possible, of some of the largest projects in the State.

Senior year; first semester; 3 credits. Fee \$0.50. Deposit \$1.00.

19. Advanced Drainage or Irrigation Work. Under this head the student who has completed the courses offered may take up further study of special problems in either subject, such as the drainage of alkali lands, drainage against seepage, study of water-table fluctuations, runoff, etc.; or field studies of the duty of water for a certain district, conservation of irrigation waters, effect of irrigation on soil moisture conditions, etc.

Elective; senior or graduate year; either semester; 2 to 5 credits. Fee \$0.50. Deposit \$1.00.

20. Advanced Drainage or Irrigation Work. Continuation of course 19 for students who wish to elect two semesters of the advanced work.

Elective; senior or graduate year; either semester; 2 to 5 credits. Fee \$0.50. Deposit \$1.00.

21. Irrigation Management. A study of the operation and maintenance of irrigation systems. Methods and records for water masters. Control of agencies destructive to ditches. Cost and durability of materials used in distribution of water on the farm. Water rotations for different types of farming.

Required of seniors and advanced students specializing in Drainage and Irrigation. Senior or graduate year; second semester; 1 credit.

A. Practical Farm Drainage. The value of drainage, and the methods and cost of installing drainage systems under different soil and land conditions, district drainage, etc.

Elective in vocational course; second semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.00.

C. Irrigation Farming Practices. The most effective methods of handling irrigation waters, the different crops under irrigation, and the cost and profits thereof. Organization as affecting water use and control in irrigated districts.

Vocational course; first semester; 2 credits; 2 recitations. Fee \$1.00. Text: Fortier, Use of Water in Irrigation.

ENTOMOLOGY

LESTER LOVETT, Professor
GEORGE FRANKLIN MOZNETTE, Assistant Professor
WILLARD JOSEPH CHAMBERLIN, Instructor

Teaching Fellow

The courses in Entomology are planned to give the student sufficient knowledge of the subject to understand the proper relation of Entomology to the different phases of Agriculture; to meet the needs of the student specializing in Entomology; and to serve the needs of students from other departments in which certain special courses are required. Students who wish to elect Entomology as a major may, if they desire, specialize in one or more branches by choosing their research problems in definitely grouped subjects. These groups include General Entomology, Agricultural Entomology, Civic Entomology, Entomology for Horticultural Inspectors, and Forest Entomology.

The courses in General and Economic Entomology are intended to provide the student with sufficient training to enable him to identify the common insect pests, understand their habits and life-history, and to apply the most approved methods for their control.

Forest Entomology includes the practical investigation of certain areas of timber to determine the kind and extent of insect infestation, methods of making out correct reports on forest insect infestation, and an investigation of the principles underlying control methods.

Advanced students in Entomology are provided with excellent opportunities for special instruction and research work. The library facilities are unusually good; the insect fauna of the western part of the State is distinctive, offering many new and interesting features for investigation.

Scheduled courses in this department will not be given to a class of less than five students.

Equipment. This department now occupies three rooms on the third floor of Agricultural Hall—one office, one laboratory, and one class room. The entomological class room is equipped for twenty-four advanced students. It also contains the entomological collections and extension materials. The research laboratory is fully equipped with up-to-date apparatus for carrying on research problems. The entomological library is exceedingly rich in old volumes and complete sets of entomological periodicals. Through

the kindness of the librarian of the U. S. Department of Agriculture, students in this department have access to entomological publications contained in the library of the Department of Agriculture and the library of Congress.

COURSES IN ENTOMOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
* Electives	13	13
	—	—
	16	16

The following courses are offered:

301. Introductory Entomology. An introduction to the study of insects by lectures, laboratory, and field exercises. Sufficient field work in collecting, and laboratory work in properly mounting and classifying insects, is provided to make the student familiar with the principal orders of insects.

Prerequisites: Zoology 101, 102, and a collection of insects consisting of at least 250 specimens. Required in the courses in Horticulture, Plant Pathology, and Entomology; elective in other courses; junior year; first semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period. Fee \$1.00. Text: Sanderson & Jackson, Elementary Entomology.

302. Entomology of Orchard and Small Fruits. An intensive study of the more important insect enemies of the apple, pear, prune, cherry, plum, currant, gooseberry, bramble fruits, and straw-

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

berry, and the critical examination of the methods to be employed in combating them. Each important pest will be studied in the field and laboratory, with a view to becoming thoroughly familiar with the appearance of the insect and its work in all its stages of development. In this and succeeding courses in Entomology the rearing of economic and other forms of insects, is carried on parallel with other work, to gain familiarity with the development and habits of insects. Each student is required to familiarize himself with the life-history, habits, and methods of controlling some insect of economic importance.

Prerequisite: Entomology 301. Required in the courses in Pomology, Plant Pathology, and Entomology; elective in other courses; junior year; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period. Fee \$1.00. Text: Sanderson, Insect Pests of Farm, Garden, and Orchard.

303. Entomology of Truck and Field Crops. A course similar to 302, with special emphasis put on the intensive study of the insect enemies of celery, onion, beet, cabbage, kale, clover, vetch, potato, hop, corn, wheat, and oats.

Prerequisite: Entomology 301. Required in the course in Vegetable Gardening; junior or senior year; elective for students in other courses; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period. Fee \$1.00. Text: Sanderson, Insect Pests of Farm, Garden, and Orchard.

304. Forest Entomology. A study of insect injuries to forest trees and forest products, factors influencing their occurrence and the general principles of control work.

The course in Forestry; junior year; second semester; 3 credits. Fee \$1.00. (Course not offered 1917-18.)

305. Forest Entomology. A continuation of course 304.

The course in Forestry; senior year; first semester; 2 credits; hours to be arranged.

Prerequisite: Entomology 304. Fee \$1.00. (Course not offered 1917-18.)

306. Advanced Entomology. This course is designed for those who desire to specialize in Entomology. The instruction includes lectures and reference reading on the biology of the principal families of insects, supplemented by laboratory studies of typical life-histories. Considerable time is devoted to studying the habits of insects, particularly injurious species in the field; to collecting,

rearing, mounting, and classifying them; and to becoming familiar with Entomological methods and literature.

Required in the course in Entomology; elective in the courses in Agriculture; junior year; first semester; three credits; one lecture; two laboratory periods. Fee \$1.00. Text: Folsom, Entomology with Reference to its Biological and Economic Aspects.

307. Advanced Entomology. A continuation of course 306.

Required in Entomology; elective in the courses in Agriculture; junior year; second semester; 3 credits; 1 lecture; 2 laboratory periods. Fee \$1.00.

308. Advanced Entomology. A continuation of courses 306 and 307.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; first semester; 5 credits; 2 lectures; 3 laboratory periods. Fee \$1.00.

309. Advanced Entomology. A continuation of courses 306, 307, and 308.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; second semester; 5 credits; 2 lectures; 3 laboratory periods. In connection with courses 306, 307, 308, and 309, the student will be required to present a thesis detailing the results of a systematic study of some restricted group of insects, or of the biology of some particular species or group of species. Fee \$1.00.

310. Household Entomology. A study of insects in their relation to pharmacy and to the household. The history and development of insects in medicine, insects in relation to disease, and insect pests of dwellings and stores. Control methods will be taken up in detail. This course is intended to prepare students in Pharmacy and Home Economics intelligently to understand the bearing of insects upon the household and community, and the principles underlying methods of control.

Primarily for Pharmacy students; open to students in Home Economics and to others by special permission; no prerequisite. Two credits; two lecture periods. Fee \$1.00.

311. Beekeeping. A course in the theory and practice of keeping bees for profit and in relation to fertilization of orchard trees. The College has an apiary in which students will be able to become fully acquainted with modern apicultural methods.

Elective in courses in Agriculture and Home Economics; second semester; 1 credit; 1 laboratory period. Fee \$1.00. Text: Phillips, Beekeeping.

312. Problems in Forest Entomology. This course will include the study and application of methods of forest insect investigations. Each student will be assigned a practical problem in Forest Entomology to work out under direction.

Credits to be arranged. Fee \$1.00. (Course not offered in 1917-18.)

313. Problems in Forest Entomology. A continuation of course 312.

Prerequisite: Entomology 312. Credits to be arranged. Fee \$1.00. (Course not offered in 1917-18.)

314. Seminar. Senior and graduate students in Entomology. Reading, discussing, and abstracting the leading articles on Entomology as they appear in the scientific journals, horticultural press, current magazines, and experiment station literature.

Senior year; first semester; 1 credit.

315. Seminar. A continuation of course 310.

Senior year; second semester; 1 credit.

316. Insect Taxonomy. An intensive study of the systematic grouping of insects; insect ecology as allied to taxonomy.

Prerequisite: Entomology 301. Elective in advanced entomology and of graduate rank; second semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$2.00.

317. Advanced Thesis and Research Methods. A course offered only for graduate students. Students will select problems in applied entomology on the life-history and control of some insect or group of insects; problems in ecology; monographic problems, etc., with special emphasis on methods of research.

Elective for graduate students only; first semester; from 8 to 16 credits.

318. Advanced Thesis and Research Methods. Continuation of course 317.

Elective for graduate students only; second semester; from 8 to 16 credits.

FARM CROPS

GEORGE ROBERT HYSLOP, Professor
HARRY AUGUST SCHOTH, Instructor

This department deals with the various problems of production, improvement, marketing, manufacture, and uses of each of the field crops produced for food, forage, textile, and special purposes. The field is a large one and deals principally with well-known and staple crops that are constantly in use and in demand. The work is closely associated with the daily food supply of man and beast, and is of importance to all students of agriculture.

The purpose of the work is primarily to teach students scientific, practical, and economical methods of crop production and improvement that may be put into actual use on the farm. In addition, the courses are so arranged that men may fit themselves for civil service positions, in agronomy, forage crops, grain standardization, plant breeding, crop marketing, etc., or for experiment station, extension, or teaching work. The object is to turn out men with a broad training on general lines and well finished in Farm Crops.

Equipment. The department has excellent recitation and well-lighted laboratory rooms. The laboratory is equipped with modern desks and tables for crop study. Gas, water, and electricity are available for general use. Special equipment consists of compound and binocular microscopes, dissecting and hand lenses, for study of crop structure and crop products; analytical and torsion balances for accurate weights; seed sampler; standard and Semper's type germinators for seed studies; and large collections of cereal, grass, and miscellaneous straw and seed specimens for class use. Grain testers, a Brown-Duvel moisture tester, a drying oven, and extensive collections of standard grain grades and corn-ear samples, provide excellent facilities for grain standardization and judging work.

The Experiment Station plots offer excellent opportunities for field study and make possible extensive collection of valuable material for class work. In addition to the above, a large collection of the best books, periodicals, etc., dealing with the subject, is available.

COURSE IN FARM CROPS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Plant Chemistry (Chem. 510) or.....		2
Plant Physiology (Bot. 50).....		3
Agricultural Bacteriology (Bact. 501).....	3	
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Field Crops (Bot. 105).....	1	
Introductory Entomology (Ento. 301).....	2	
Cereal Crops (Farm Crops 57).....	4	
Land Drainage (Drain. & Irr. 1).....		3
Crop Improvement (Farm Crops 15).....		3
Soil Physics (Soils 5).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Elective		3 or 4
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Agrostology (Farm Crops 11).....		3
Forage Crops (Farm Crops 9).....	2	
Soil Fertility (Soils 7).....	3	
Farm Management (Farm Mgt. 1).....		3
Advanced Crop Breeding (Farm Crops 17).....		2
Advanced Crop Work (Farm Crops 23).....	2	
Feeds and Feeding (A. H. 23).....		3
Potato Growing (Farm Crops 13).....	1	
Elective	5	2
	—	—
	16	16

The following courses are offered:

1. **Crop Production.** Lectures and recitations on description, adaptability, seed-bed preparation; selection, storage, treatment, testing, and planting of seed; cultural methods; habits of growth; harvest, preservation, storage, marketing, rotation, production costs, and uses of the leading cereal, forage, and special field crops. The eradication of weeds. Laboratory work consists of studies of purity and germination of seed, methods of testing, seed cleaning, and seed treatment, corn and seed judging. Practical

work consists of studying crop problems in the field on the College farm.

Agriculture; freshman year; either semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50.

5. Cereal Crops. A study of the production, standardization, and marketing of cereal and allied grains from seed to consumer. Especial attention is given to varieties, their distribution and adaptability, methods and conditions for production, quality as affected by environment, markets, manufacture, and uses of wheat, oats, corn, rye, and less important cereals, and their enemies and control. Laboratory work consists of studies of varieties, their identification before and after threshing, cereal judging, grain standardization, moisture and gluten and hardness testing, conditions affecting germination, weight per bushel, etc. Suited to cereal specialists, grain growers, and those desiring civil service work along this line.

Agriculture; junior year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$0.50. Texts: Carleton, Small Grains. Montgomery, The Corn Crops.

7. Cereal Crops, Lectures. Same as course 5 except laboratory work is omitted. Not suited to students desiring special cereal work or to do civil service work in Agronomy, grain standardization, or grain marketing.

Agriculture; junior year; first semester; 2 credits; 2 lectures.

9. Forage Crops. A study of legumes, grasses, and succulent crops adapted to the work of students in agriculture. Temporary pasturing systems, seeding, care, and maintenance of permanent pasture; reseeding and care of range. Adaptability, culture, methods of handling, and value of various crops for forage. Silage and hay making. Soiling crop rotations. Costs, storage and marketing.

Agriculture; junior or senior year; first semester; 2 credits; 2 recitations. Fee \$0.50. Text: Piper, Forage Crops.

11. Agrostology. A study of the grasses, legumes, and other forage and seed crops. Methods of seeding, production, harvesting, and marketing of meadow, pasture, cover, and special crops for seed, fiber, and special purposes other than forage. The comparative structure and identification of the different forage plants, their adaptability to different conditions of soil and climate. Examinations of commercial seed for viability and purity. The identification of weed seed. The production of forage-crop seed. This

course with Forage Crops, Farm Crops 9, fits persons for forage and seed specialization.

Agriculture; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50. Texts: Piper, Forage Plants. Hitchcock, A Textbook of Grasses.

13. Potato Growing. A detailed study of potato soils, fertilization, culture, harvest, improvement, storage, costs, markets, distribution, uses, and manufacture. Varietal studies and identification. Potato judging and scoring.

Agriculture; senior year; 1st semester; 1 credit; 1 recitation. Fee \$0.50.

15. Crop Improvement. Studies of practical means of improving farm crops in quality and yield; field selection; mechanical and score-card methods of seed selection; variety testing; head and ear-to-row methods; multiplication; and pure-seed production. Hybridization and plant-breeding laws applicable to practical crop improvement. Laboratory and field work consists of studies of transmission of characters, field selection, planning and planting of plots, hybridization methods, etc.

Agriculture; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50.

17. Advanced Crop Breeding. An advanced course dealing with field-crop breeding from a more technical view point. Hybridization, variability, and its measurement. Transmission of characters. Behavior of characters of specific crops. A course designed for students desiring to enter plant-breeding work.

Agriculture; senior year; second semester; 2 credits; 2 recitations.

19. Seed Testing. A course for students preparing themselves for private, state, or government seed-testing work. Studies are made of seed identification and germination, seed legislation, and standard methods of seed testing. Students electing this course should take Botany 47 and Agrostology (Farm Crops 11).

Agriculture; senior year; first or second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

21. Weed Eradication. This course deals with weed types and habits of growth, weed laws, and the various practical methods of prevention, control, and eradication. Special attention is paid to noxious, persistent, perennial, and poisonous weeds of ranch and range.

Agriculture; junior or senior year; first semester; 1 credit; 1 recitation.

23. Advanced Crop Work. Lecture or laboratory work or both will be offered to groups of students desiring additional work in various lines of crop production. Suggested topics are sugar beets, hops, flax, seed testing, grain standardization, grain grading, experimental methods, etc. Individual students desiring special work will be assigned to some practical problem involving experimental or research work and the preparation of a thesis.

Agriculture; senior year; either semester; 1 to 5 credits; fee to be arranged.

24. Advanced Crop Work. Continuation of course 23 for students who wish to elect two semesters of this advanced work.

Agriculture; senior or graduate year; either semester; 1 to 5 credits; fee to be arranged.

Graduate Work. Candidates for advanced degrees majoring in Farm Crops will be assigned some specific problem of a practical nature requiring careful original work. Result of laboratory and field work, together with a review of the literature of the subject, must be embodied in a suitable thesis.

Agriculture; graduate year; either semester or both; credits and fees to be arranged.

A. Farm Crops. A practical course dealing with soil and climatic adaptations; seed selection, care, testing, and judging; seed-bed preparation, planting, culture, and harvest; storage, market, rotation, production costs, and improvement methods for the important farm crops of various sections of Oregon. Seed treatment, practical methods of weed eradication, and control and prevention of field-crop pests.

Vocational Agriculture; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50.

FARM MECHANICS

WILLIAM JAMES GILMORE, Assistant Professor

The purpose and scope of the work in Farm Mechanics is indicated fully in the description of courses given below.

Equipment. The Farm Mechanics building is complete for Farm Mechanics work. It is an attractive, well-lighted, brick building, having a large operating floor, a class room, locker room, shop and tool rooms on the first floor. The operating room is used for displaying the heavier farm machines and for indoor operation of tractors and automobiles. A gallery surrounds this operating floor and provides space for the lighter farm machines, such as tillage,

hay, and harvesting machines, and manure spreaders, many of which are operated from a line shaft.

A very large equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest, so that the student has constantly before him and is working with and studying the very best farm machines of all types. Plows, harrows, pulverizers, rollers, cultivators, corn planters, potato planters and diggers, grain and grass seeders, mowers, rakes, hay loaders, corn and grain binders, sprayers and manure spreaders, ensilage cutters, hay balers, and threshing machines, are representative machines found in the laboratory. The large, well-lighted gas-engine laboratory contains many different makes of gas engines and accessories, such as sectional carburetors, magnetos, and lubricators. In addition to this equipment is the large selection of grain-cleaning and crushing machines, farm-lighting plants, pumps, rams, and water-supply equipment.

The laboratory is also equipped with two large brakes for the testing of tractors; dynamometers for determining the draft of the field machines and the draw-bar horse power of tractors, and also a gas and steam indicator for determining the efficiency of farm engines and tractors; and an electric motor and watt meter, so that the student may become familiar with the power requirements of belt-driven farm machines.

COURSES IN FARM MECHANICS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

	Junior Year	Semester	
		1st	2nd
Agricultural Economics (Com. 219).....		3	
Drill (Military 5, 6).....		1	1
Military Science (Theo. Inst. 1, 2).....		1	1
* Electives		12	15
		—	—
	Senior Year	17	17
National Government (Com. 320).....		3	
State and Municipal Government (Com. 322).....			3
*Electives		13	13
		—	—
		16	16

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

The following courses are offered:

1. General Farm Mechanics. Concrete construction on the farm, farm water supply, detailed and comparative study of field machines, assembling and adjusting field machines, crushing and cleaning machinery, threshing machinery, heating farm homes, power requirements of belt-driven machines, field tests showing draft and effects of mis-adjustments in field machines, farm fences, selection and care and adjustments of farm machines, demonstrations of tractor for field operations, farm gas and electric lighting.

Elective; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.50. Deposit \$1.00. Text: Davidson, Farm Machines and Farm Motors.

3. Farm Power Machinery. Detail and comparative study of farm gas engine. Construction and operation of engine. Study of carburetors, ignition, governing, and cooling systems, lubricants, and lubrication. Testing, adjusting, and trouble hunting. Detail study and power requirements of belt driven machines, such as crushers, ensilage cutters, etc. Pumping machinery and hydraulic ram. Pipe fitting, babbitting, soldering, belt lacing, and valve grinding.

Elective; junior year; either semester; 3 credits; 1 recitation; 2 laboratory periods.

Fee \$2.00. Deposit \$1.00. Text: Gas Engine on The Farm.

5. Farm Motors and Tractors. Detail study of gas and steam tractors; starting and operating, carburetors, lubricators, ignition systems. Valve setting on steam engines; flue repair. Electricity in its adaptation to farm uses. Indicated, brake, and drawbar horse-power tests of tractors.

Prerequisite: Farm Mechanics 3. Elective; senior year; either semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$2.00. Deposit \$1.00.

7. Dairy Mechanics. Concrete floors and sidewalks, concrete bases for machines, detailed study of gas engine operation; trouble hunting and tests of gas engine; gas engine accessories; study of steam boilers and steam engines; firing and operating steam engines; lubricators; injectors; magnetos; flue repair.

Elective; junior or senior year; either semester; 1 credit; 1 3-hour laboratory period. Fee \$1.00. Deposit \$1.00.

9. Orchard Machinery. Given to Horticultural students from the mechanical standpoint, and includes study of construction,

operation, and efficiency of orchard machinery, such as gas engines, pumps, tillage, and seeding implements. Orchard plowing and cultivation. Demonstration of tractor for orchard work. This course is intended only for students who cannot take the regular courses in Farm Mechanics.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods. Fee \$1.50. Deposit \$1.00.

13. Advanced Farm Mechanics. For students who have inclinations toward mechanics and who feel that more work is needed than was obtained in courses 1, 3, and 5. This course includes efficiency tests of gas and steam tractors (indicated, brake, and drawbar), plowing with tractors, power requirement tests of belt-driven machines with electric motor and watt meter, automobile study and operation, magnetos, self-starters, farm lighting, concrete construction, binder adjustments, dynamometer tests of various field machines.

Prerequisites: Farm Mechanics 1, 3, and 5. Elective; senior or graduate year; either semester; 1 or 2 credits. Fee \$2.00. Deposit \$1.00.

14. Advanced Farm Mechanics. Continuation of course 13 for students who wish to take the second semester of this advanced work.

Elective; senior or graduate year; either semester; 1 or 2 credits.

15. Concrete Construction and Farm Machines. A special course designed to meet the requirements of the Industrial Arts students who expect to teach Farm Mechanics, Farm and Ornamental Concrete Construction; detail study, operation, trouble hunting, and testing, gas engines; gas and steam engine accessories; exercises with the common farm machines and such exercises as babbitting, belt lacing, and rope tying and splicing will be given.

Elective; junior or senior year, Industrial Arts; one semester; three credits. Fee \$2.00.

A. Farm Machines and Engines. A general course in Farm Mechanics. The more important field machines and gasoline engines are studied. Farm buildings, concrete work, rope work, etc., are also given attention.

One-year course; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.50. Deposit \$1.00.

HORTICULTURE

CLAUDE ISAAC LEWIS, Professor
VICTOR RAY GARDNER, Professor of Pomology
* EZRA JACOB KRAUS, Professor of Research
ARTHUR LEE PECK, Associate Professor
ARTHUR GEORGE BOUQUET, Associate Professor
WALTER SHELDON BROWN, Assistant Professor (Ext.)
MOSHER DWEN BUTLER, Instructor
ALDEN FORREST BARSS, Instructor
HARRY DUANE LOCKLIN, Instructor
JOHN ROBERT MAGNESS, Instructor
SAMUEL KILBOURN WHITE, Teaching Fellow

The scope of the work in Horticulture is very broad, giving instruction in Pomology, Olericulture, Floriculture, Landscape Gardening, School Gardening. In these courses the student is first thoroughly grounded in the fundamentals, and is then allowed to specialize as he may desire. He may thus fit himself for station or government work, or prepare for the many lines in horticultural business, such as fruit growing, truck gardening, floriculture, or landscape gardening.

The required work for students electing horticulture covers a wide range, giving the student a thorough training, not only in plant propagation and the general principles of orchard management and vegetable growing, but in floriculture and landscape gardening as well, thus broadening his views and interesting him in the aesthetic and all that pertains to more beautiful surroundings.

The courses consist of lectures, reference reading, field exercises, and laboratory work. Much stress is placed upon the practical phases of all the work. In all courses horticultural truths are illustrated by practice, whenever possible. Students are given field and laboratory exercises in all such operations as planting, seeding, budding, grafting, cultivating, thinning, pruning, harvesting, and spraying.

The Horticultural Building contains modern laboratories for spraying, plant propagation, fruit packing, systematic pomology, and vegetable preparation. There are special class rooms, large draughting rooms, museum, and greenhouses. The department is also establishing young orchards and vegetable gardens, and has at its disposal a large campus upon which are planted many species of trees and shrubs. The student is materially assisted in all of his work, and the research work especially, by the excellent horticultural library.

* On leave of absence.

Equipment. The Horticultural wing of the Agricultural building contains many spacious rooms, and thoroughly modern equipment for teaching the various subjects. In the basement will be found a large spray laboratory furnished with gas and water and all the equipment, chemicals, and apparatus which are necessary to teach students the proper mixing and testing of the different sprays; accommodations are offered also for the testing of nozzles and spraying apparatus. The department has a large number of hand and power spraying outfits that are placed at the disposal of students.

A large, well-lighted plant-propagation laboratory offers unexcelled opportunities for the study of plant propagation. Specially equipped cabinets, tables, and incubators have been constructed; so that the students can study to advantage such topics as seedage, layerage, making of cuttings, and budding and grafting.

A laboratory has been especially fitted for the use of students in gardening. It contains large cement-set tubs, where students are taught the proper methods of preparing vegetables for market. This room also contains a demonstration earth bed for use during the winter, to show how the various tools for planting seed and for cultivation are used. The demonstration bed also allows the instructor to demonstrate the proper method of interplanting and transplanting of plants.

In the basement is also located a very large fruit-packing laboratory, equipped with box presses, grading machinery, and packing tables. The large storage rooms are also located in the basement and include a suite of rooms which are chilled by mechanical refrigeration.

On the first floor a systematic pomology laboratory is especially equipped for the study of nuts, fruits, etc. A special research laboratory, located on this floor, is used for research assistants in the department, and is also at the disposal of advanced students. This room is completely equipped with ovens, microscopes, and other apparatus necessary for extensive research work.

On the top floor, in the horticultural museum, are exhibited all sorts of equipment used in Horticulture, such as pruning shears, budding and grafting utensils, prune-drying apparatus, fruit graders, etc. On this floor a large draughting room extends along the entire south end of the building, fully supplied with tables, cabinets, etc., for the use of students studying Floriculture, Landscape Gardening, Greenhouse Construction, Orchard Planting, and

Packing House Construction. In addition to these rooms, the department has four large lecture rooms. A balopticon with a good collection of lantern slides, and a large library, add materially to the equipment.

The department is also well provided with tools and apparatus necessary for conducting field exercises in Truck Gardening, Floriculture, Landscape Gardening, and Pomology.

COURSES IN HORTICULTURE

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

(a) Pomology

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Floriculture (Hort. 401).....	2	
Landscape Gardening (Hort. 301).....		2
Plant Propagation (Hort. 105).....		2
Practical Pomology (Hort. 102).....	2	
Orchard Practice (Hort. 103, 104).....	2	2
Plant Physiology (Bot. 50).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	6	6
	<hr/> 17	<hr/> 17

Senior Year

National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Systematic Pomology (Hort. 115).....	4	
Commercial Pomology (Hort. 117).....		3
Introductory Entomology (Ento. 301).....	2	
Entomology of Orchard and Small Fruits (Ento. 302).....		2
History and Literature of Horticulture (Hort. 125).....		2
Seminar (Hort. 123, 124).....	1	1
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Orchards and Small Fruits (Bot. 102).....		2
Approved Electives	5	4
	<hr/> 17	<hr/> 17

(b) Olericulture

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Plant Propagation (Hort. 105).....		2
Practical Vegetable Gardening (Hort. 203, 204).....	3	3
Floriculture (Hort. 401).....	2	
Landscape Gardening (Hort. 301).....		2
Introductory Entomology (Ento. 301).....	2	
Entomology of Truck and Field Crops (Ento. 303).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	5	5
	—	—
	17	17

Senior Year

National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Commercial Truck Gardening (Hort. 209, 210).....	3	3
Forcing Vegetables (Hort. 205, 206).....	2	2
Systematic Olericulture (Hort. 207).....	1	
Seminar (Hort. 123, 124).....	1	1
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Vegetable Crops (Bot. 104).....		2
Approved Electives	4	5
	—	—
	16	16

(c) Floriculture**Junior Year**

Agricultural Economics (Com. 219).....	3	
Floriculture (Hort. 401).....	2	
Landscape Gardening (Hort. 301).....		2
Plant Materials (Hort. 305, 306).....	3	3
Greenhouse Construction (Hort. 403).....		3
Introductory Entomology (Ento. 301).....	2	
Entomology of Truck and Field Crops (Ento. 303).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	4	4
	—	—
	17	17

	Semester	
	1st	2nd
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Forcing Flowers (Hort. 405, 406).....	3	3
Agricultural Bacteriology (Bact. 501).....	3	
Forcing Vegetables (Hort. 205, 206).....	2	2
Advanced Plant Breeding (Hort. 127, 128).....	3	3
Diseases of Vegetable Crops (Bot. 104).....		2
Approved Electives	2	3
	—	—
(d) Landscape Gardening	16	16

Freshman Year		
Modern English Prose (Eng. 81, 82).....	3	3
Plane Surveying (C. E. 222).....		5
Modern Language (French, German, or Spanish, first Yr.)	3	3
Agricultural Botany (Bot. 41, 42).....	3	3
Trigonometry (Math. 11).....	3	
Architectural Drawing (Arch. 601).....	3	
Drill (Military 1, 2).....	1	1
Library Practice (Libr. 1).....		½
Hygiene (Phys. Ed. 10).....		½
Gymnasium (Phys. Ed. 15, 16).....	½	½
Approved Elective	1	1
	—	—

Sophomore Year		
	17½	17½
American Literature (Eng. 71, 72).....	3	3
Modern Language (French, German, or Spanish, second Yr.)	3	3
Topographic Surveying (C. E. 223).....	5	
Railroad and Canal Surveying (C. E. 272).....		5
Principles of Fruit Growing (Hort. 101-a).....	2	
Fundamentals of Land. Gard. (Hort. 101-b).....	1½	
Landscape Gardening (Hort. 301).....		2
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	½	½
Approved Electives	3	4
	—	—
	18½	18½

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Composition of Addresses (Eng. 103, 104).....	2	2
Water Color Rendering (Arch. 505, 506).....	2	2
Floriculture (Hort. 401).....	2	
Plant Materials (Hort. 305, 306).....	3	3
Hist. and Lit. of Landscape Architecture (Hort. 311).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	3	6
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Theory and Design (Hort. 307, 308).....	2	3
Town Planning (Hort. 313).....	3	
Field Practice (Hort. 309, 310).....	3	3
Approved Electives	5	7
	16	16

It is suggested that four of the elective credits in sophomore year be taken in Architectural drawing and Perspective, such as Arch. 602, Arch. 518.

The following courses are offered:

101-a. Principles of Fruit Growing. This includes the problems incident to the establishing of an orchard. It embraces a consideration of such questions as locations, site, soils, windbreaks, variety selection, selection of nursery stock, and planting. Some attention is also given to problems incident to maintenance, especially the maintenance of the home orchard. It is designed especially for general agricultural students, who are interested mainly in the orchard as an accessory of the general farm. At the same time, it is a fundamental course for students desiring to pursue other horticultural studies.

Required of all Agricultural students; sophomore year; 2 credits; 3 recitations; 1 laboratory period. Fee \$1.50. Text: Sears, Productive Orchardng.

101-b. Fundamentals of Landscape Gardening. This course consists of a series of lectures and practicums dealing with the beautifying of the farm home and rural public buildings. It begins

after the Christmas holidays and extends to the end of the second week in March. Registration for the course should be arranged in September.

Required of all Agricultural students; sophomore year; 1½ credits; for the remainder of the first semester, 3 recitations and 1 laboratory period; for the first part of the second semester, 1 lecture and 1 laboratory period. Text: Sears, Productive Orchard-ing.

Pomology

102. Practical Pomology. A continuation of course 101-a. It deals especially with the problems incident to the maintenance of the commercial orchard, including a study of such questions as cover crops, fertilization, irrigation, frost occurrence and prevention, pollination, pruning, thinning, spraying, and spray injury.

Required of students majoring in Pomology; junior year; first semester 2 credits; 3 recitations. Text: Bailey, The Pruning Book.

103. Orchard Practice. A laboratory course in which the student obtains actual practice in regular orchard and packing-house operations. The work includes tree planting, pruning, the preparation of spray solutions, a study of spray machinery, orchard spraying, orchard heating, and the picking, grading, packing, and judging of fruits.

This course is open only to those who have taken or are taking course 102.

Required of juniors majoring in Pomology; junior year; first semester; 2 credits; 1 laboratory period of four hours scheduled for Saturday forenoons. Fee \$1.00.

104. Orchard Practice. A continuation of course 103.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 laboratory period of four hours scheduled for Saturday forenoons. Fee \$1.00.

105. Plant Propagation. A study of the propagation of plants by means of seeds, separation, division, layerage, cuttage, and graftage. Sufficient attention is given the subject of nursery management to acquaint the student with its more important features.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

109. Viticulture. A study of the problems pertaining to the growing, harvesting, and marketing of both the American and European types of grapes. Soils, locations, pruning, training,

harvesting, grading, packing, storage, etc., are some of the questions receiving attention.

Elective; open to juniors and seniors; second semester; alternate years; (not given in 1918); 2 credits; 2 recitations.

111. Small Fruit Culture. A study is made of the problems connected with the growing, harvesting, and marketing of such fruits as the strawberry, currant, gooseberry, raspberry, blackberry, loganberry, and cranberry.

Elective; open to juniors and seniors; second semester; 2 credits; 2 recitations.

113. Nut Culture. A study of the methods of growing, harvesting, curing, and marketing of such nut crops as the walnut, filbert, almond, and pecan. In the laboratory a detailed study is made of the leading varieties of these different nuts.

Elective; open to juniors and seniors; second semester; alternate years (to be given in 1918); 2 credits; 1 recitation; 1 laboratory period.

115. Systematic Pomology. A study of the principles underlying pomological nomenclature and variety description, classification, and adaptation. A critical study is made of many varieties of fruits, of the influence of environment upon behavior of fruit trees and the development of their products. The student becomes acquainted with the more important fruit groups and their interrelationships.

Required of seniors majoring in Pomology; senior year; first semester; 4 credits; 2 recitations; 3 laboratory periods. Fee \$3.00.

117. Commercial Pomology. The problems of handling fruit, including the picking and grading and packing of fruits; a study of the problems of transportation, storage, distribution, and marketing. Considerable attention will also be given to the planning of buildings for the packing and storing of fruit.

Required of seniors electing Pomology as a major; senior year; second semester; 3 credits; 3 recitations.

119. Sub-Tropical Pomology. This course takes up in detail the problems concerned with the growing and marketing of such sub-tropical fruits as oranges, figs, olives, pineapples, etc.

Elective; senior year; first semester; 2 credits; 2 recitations.

121. Advanced Pomology. A finishing course in pomology. The students will first be given a general review to determine their knowledge of pomology. The course is designed especially to fit students for Civil Service examinations. The latter part of the

course will be devoted to the study of some advanced problems in pomology, and will also include a study of orchard costs and economics, the cost of production, and marketing.

Elective; senior year; second semester; 3 credits; 3 recitations.

123. Seminar. A course especially arranged for senior and graduate students in Horticulture. A study is made of some of the advanced problems. Articles from the leading magazines on horticultural subjects, as well as station and Government publications, are reviewed.

Elective for Agricultural seniors; required for advanced students having their major in Horticulture; senior year; first semester; 1 credit; 1 two-hour recitation.

124. Seminar. Continuation of course 123.

Prerequisite: Course 123; elective for seniors electing Horticulture as a major; senior year; second semester; 1 credit; 1 two-hour recitation.

125. History and Literature of Horticulture. A study is made of the literature and history of Horticulture from the time of the Egyptians to modern times.

Required of seniors electing Pomology as a major; senior year; second semester; 2 credits; 2 recitations.

126. Advanced Orchard Practice. This course will deal with problems of pruning, spraying, budding, and grafting. It will consist entirely of field work or laboratory exercises. Work will be conducted not only at Corvallis, but in various other sections of the State. The course is especially offered for those students who have had regular orchard-practice work, and who have the qualifications to enable them to secure benefit from the course.

Students can only be registered by appointment with the head of the department. Schedule by arrangement in four-hour periods on Saturdays. Work will commence January 1, and extend to May 1.

2 credits; 1 laboratory period.

127. Plant Breeding. The principles of breeding. A study of some of the facts pertaining to variation, classification of variations, causes of variation, and the theories that have been advanced to explain the inheritance of characters. The class room work will consist of lectures, reference readings, and recitations; the laboratory work will acquaint the student with statistical methods of studying variation; and through greenhouse experiments

he will become acquainted with some of the ways in which environment influences plant growth.

Elective; open to seniors and graduate students (and to juniors by special permission); first semester; 3 credits; 3 recitations; 1 laboratory period. Fee \$1.00. Text: Davenport, Principles of Breeding.

128. Plant Breeding. A continuation of course 127. A study of breeding systems and recent breeding work. For the laboratory work, each student will be assigned to some problem that will give him a knowledge of the technique involved in plant breeding studies, and of the methods that are employed in plant breeding investigations.

Elective; open to seniors and graduate students (or to juniors by special permission); second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Davenport, Principles of Breeding.

Vegetable Gardening

Students taking their major in this course are required to take Horticulture 301 and 401.

201. Vegetable Growing. This course is offered for the purpose of teaching the student the value of a well-conducted farm or home vegetable garden, serving especially those students who cannot further pursue a horticultural course. At the same time, the work will be fundamental in the instruction of higher courses in commercial vegetable growing and marketing, for those students who desire to pursue work in this branch of Horticulture.

Required; sophomore year; second semester; 1½ credits; 1 lecture; 1 laboratory period. Work begins the third week in March. Registration should be arranged at opening of second semester. Fee \$0.50. Text: Lloyd, Productive Vegetable Gardening.

203. Practical Vegetable Gardening. This course is offered to those students wishing to learn the fundamentals of the business of vegetable gardening. The practices of the leading commercial growers in all phases of field management will be studied, including such problems as vegetable soils, locations, production of plants, distribution of crops, successions, rotations, manures and fertilizers, irrigation, implements, capital, labor, and other vital factors in the management of a commercial vegetable farm.

Required of juniors electing Vegetable Gardening as a major; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

204. Practical Vegetable Gardening. A continuation of the above course, designed especially for those who are specializing in vegetable growing. Course 204 offers work dealing with the methods used in the commercial production of vegetables for market, consisting largely of practicums in field and greenhouse so as thoroughly to acquaint the student with proper methods and management. The commercial testing grounds, trips to vegetable farms, and the College greenhouses give ample opportunities for the student to fit himself for later commercial work.

Required of juniors electing Vegetable Gardening as a major; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Text: Corbett, Garden Farming.

205. Forcing Vegetables. The problems connected with the forcing of such vegetables as lettuce, cucumbers, tomatoes, rhubarb, and melons, in cold frames, hotbeds, and greenhouses. Lectures and exercises in the greenhouses.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 2 credits; 1 lecture; 1 laboratory period.

206. Forcing Vegetables. Continuation of course 205.

Prerequisite: Horticulture 205. Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

207. Systematic Olericulture. Description, nomenclature, and classification of vegetables. Exercises are given in displaying and judging vegetables.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 1 credit; 1 laboratory period.

209. Commercial Truck Gardening. Only the purely commercial aspects of market gardening and trucking are offered in this course. Problems of growers in the production of vegetables on an extensive scale for market and cannery will be considered. Students will be fitted by this course for extensive or intensive operations, and for managerial positions. Particular attention will be paid to modern methods of marketing vegetables; and the economics of producing vegetable crops will be treated in lectures and discussions.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

210. Commercial Truck Gardening. A continuation of course 209.

Prerequisite: Horticulture 209. Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Landscape Gardening

(For the first course in Landscape Gardening, see Pomology 101-b.)

301. Landscape Gardening. All students should be interested in everything that pertains to the decoration of the home, the improvement of school grounds, the beautifying of streets, and the establishment of recreation grounds and parks. In the course in Landscape Gardening the general principles of this are so treated as to apply to the up-building of the aesthetic in everyday life.

Required of Agricultural juniors electing Horticulture as a major; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

303. Tree Surgery. The principles of tree surgery are presented and put into execution in the laboratory. All the varying cuts, cavities, fillings, bracing, and cultivating will be worked out in a practical manner.

Elective; junior year; first semester; 1 credit; 1 laboratory period.

304. Tree Surgery. A continuation of course 303.

Elective; junior year; second semester; 1 credit; 1 laboratory period.

305. Plant Materials. To create satisfactory landscape effects, one must have a broad knowledge of the materials with which landscape architects must work. A thorough study is given to trees, both evergreen and deciduous, shrubs, vines, perennial herbaceous plants, biennials and annuals, with a view to bringing out their characteristics, such as foliage, color, form, adaptation, hardiness, and artistic effect.

Prerequisite: Horticulture 301. Elective; junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

306. Plant Materials. A continuation of course 305.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

307. Theory and Design. A study of the best works of prominent landscape architects, together with a wide range of collateral reading bearing upon the various problems. Private estates, public parks and play grounds, boulevards, and cemeteries will be

carefully studied. Reports, such as those of park boards and landscape architects, will also be studied.

Prerequisites: Horticulture 301, 305, 306. Elective; senior year; first semester; 2 credits; 2 laboratory periods.

308. Theory and Design. A continuation of course 307, in which a large portion of the time will be devoted to the preparation of planting plans. Outside time will be required for collateral reading.

Prerequisites: Horticulture 301, 305, 306, 307. Elective; senior year; second semester; 3 credits; 3 laboratory periods.

309. Field Practice. A course in practical problems brought in from the field of practice. The student is required to make the surveys, do the engineering work incidental to the solving of the problem, make general plans, planting plans, grading plans, details, and, in short, perform all the duties ordinarily met with in the landscape architect's office.

Prerequisites: Horticulture 301, 305, 306. Civil Engineering required in freshman and sophomore year. Elective; senior year; first semester; 3 credits; 3 laboratory periods.

310. Field Practice. A continuation of course 309.

Prerequisites: Horticulture 301, 305, 306, 309. Civil Engineering required in freshman and sophomore year. Elective; senior year; second semester; 3 credits; 3 laboratory periods.

311. History and Literature of Landscape Architecture. Designed to give the student a good idea of the development of the art, and to bring him into close touch with the literature, past and current, that is related to the subject.

Elective; senior year; second semester; 2 credits; 2 recitations.

313. Town Planning. This course is offered in order that the student may understand, in a general way, the underlying ideas of municipal, town, and village improvement. Literature and reports are studied, town problems discussed, and methods of procedure in town improvement worked out.

Elective; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Floriculture

Students taking their major in Floriculture are required to take Horticulture 301 and 401.

401. Floriculture. An elementary course in the cultivation of greenhouse and home plants and of the common annuals and perennials used in outdoor work. The course is designed to broaden

the views of those students who are unable to take advanced courses in Floriculture, and to make them more useful citizens.

Required of Agricultural juniors electing Horticulture as a major; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$0.50.

403. Greenhouse Construction. A course particularly adapted for students specializing in Floriculture and Truck Gardening. The problems connected with the building of greenhouses, hotbeds, and cold frames are dealt with; also the selection of materials; the various systems of heating and ventilating, and the value of the various types of buildings. Lectures and laboratory exercises in greenhouse and draughting room are conducted.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

405. Forcing Flowers. The propagation and problems of culture; such as soils, ventilation, and heat, connected with the forcing of plants used in the florist's trade.

Prerequisite: Horticulture 401. Elective; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

406. Forcing Flowers. A continuation of Horticulture 405.

Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

501. Floriculture. As related to the cultivation of the common household and dooryard flowers, instruction is given in various subjects; namely, proper soils, planting of seed, transplanting, making of cuttings, cultivation, principles of heating and ventilating, and control of insect pests and diseases. In addition, such problems as the grouping and arranging of flowers, so as to obtain the best color harmonies and most pleasing effects while growing, as well as for decoration purposes, are included. The lectures are supplemented by reference reading and laboratory periods in the greenhouse and garden.

Course in Home Economics; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

503. Landscape Gardening. The general principles of Landscape Gardening are taught, the aim being to give the student sufficient foundation to understand landscape gardening as applied to home decoration; to interest the student in the home beautiful; and the improvement of our public school grounds, and city and village streets. A study is made of photographs, and of famous landscape paintings, showing good taste and design in various

phases of Landscape Gardening. Lectures and reference readings are supplemented by field exercises.

Course in Home Economics; second semester; 2 credits; 1 recitation; 1 laboratory period.

505. Vegetable Gardening and Small Fruit Culture. Care of soil, seeding, rotation, fertilizing, and the selection of the best varieties of vegetables and small fruits for use in the home garden. Lectures, laboratory, and field exercises.

Course in Home Economics; second semester; 3 credits; 2 recitations; 1 laboratory period.

By-Products

601. Horticultural By-Products. A general study of horticultural by-products, including a study of the growth and development of this important industry in this country and abroad, but more especially in the Pacific Northwest. In addition, the course will deal with the establishment of plants, their operation, and the fundamental principles connected with canning, evaporating, drying, and the manufacture of fruit juices.

Elective; junior or senior year; first semester; 1 credit; 1 recitation.

603. Dried Products. A detailed study of the evaporation and drying of fruits and vegetables. It will include a study of the types of buildings now used, and of the machinery and apparatus needed in the successful operation of the various types of driers. This course will also deal with the technique connected with the evaporation and drying and processing of such products as apples, pears, peaches, apricots, berries, and vegetables.

Elective; junior or senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Not offered in 1917-18.

605. Canning. A study of the establishment, management, and operation of canneries, including a study of necessary buildings, machinery, and the successful operation of canneries. It will also include a detailed study of the various methods used in canning, and in the manufacture of sirups, jellies, etc.

Elective; junior or senior year; second semester; three credits; one recitation; two laboratory periods. Not offered in 1917-18.

607. Fruit Juices. A study of the manufacture of cider, vinegars, and juices of such fruits as the apple, grape, and loganberry. A study will be made of the various types of buildings and machinery suitable for the manufacture of such juices, together with

the study of the best methods embraced in the manufacture of fruit sirup and juices.

Elective; junior or senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Not offered in 1917-18.

Research

The department of Horticulture is unusually well equipped for offering research work. In addition to the laboratory facilities, there are the greenhouses, experimental plots, and a splendid research library, well supplied with scientific books and periodicals, all combining to give the student unsurpassed facilities.

701. Research Work for Seniors. This course is offered for those seniors who are contemplating following college, experiment station, or Government work as a life career, or for those students who desire to have some special training in research technique. Problems will be assigned to the students which will give them experience in the laboratory, greenhouse, field, and library.

Elective; senior year; first semester; 3 credits.

702. Research Work for Seniors. A continuation of course 701.

Elective; senior year; second semester; 3 credits.

703. Advanced Thesis and Research Work. A course offered only for graduate students. Such students will be allowed to select problems in pomology, vegetable gardening, landscape gardening, floriculture, plant breeding, and the like.

Elective; for graduate students only; first semester; from 10 to 20 credits.

704. Advanced Thesis and Research Work. A continuation of course 703.

Elective; for graduate students only; second semester; from 10 to 20 credits.

705. Methods of Research. This course is offered to graduate or senior students interested in research work. It will be conducted as a research round table. Special drill will be given in the making of briefs and outlines of research problems, in methods of procedure in conducting investigative work, and in the preparation of bulletins and reports. The study of research problems conducted by the department of Horticulture will be taken up, and a close study made of the research work which is presented in bulletins from other institutions.

Elective; senior or graduate students; first semester; 1 credit.

706. Methods of Research. Continuation of course 705.

Elective; senior or graduate students; second semester; 1 credit.

A. Horticultural Practice. Practical fruit growing, dealing with such subjects as the choice of locations, sites, soils, and varieties; the establishment of orchards, including staking, setting trees; the maintenance of the orchard, including such topics as tillage, maintaining orchard fertility, thinning, pruning, spraying; the propagation of the principal fruits, and the study of the most common methods of budding and grafting; handling the fruit crop, including picking and packing.

One-year course in Agriculture; first semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$1.00.

B. Horticultural Practice. Continuation of course A. The greater part of the work, however, will be devoted to vegetable gardening and landscape gardening. The first part of the semester will be devoted to a fundamental study of vegetable gardening, and will deal with such problems as the choice of soils and locations; production of plants, including problems connected with the use of manures and fertilizers, irrigation, tillage, etc.; the harvesting and market preparation and disposal of vegetable products. The latter part of the semester will be devoted to a study of landscape gardening; and will deal with fundamental principles and their application in beautifying the farm home.

One-year course in Agriculture; second semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$1.00. The sophomore's required work in Horticulture allows 3 credits in the first semester, and 2 in the second semester. The work is divided into three parts; namely, Pomology, Landscape Gardening, and Vegetable Gardening.

The work in Pomology, designated as 101-a, is given the first semester, extending only to the Christmas holidays, for which 2 credits will be allowed.

The work in Landscape Gardening, designated as 101-b, begins after the Christmas holidays, and extends to the end of the second week in March, for which 1½ credits will be allowed. Registration for this course should be arranged with the first semester registration in September.

The work in Vegetable Gardening, designated as 201, begins with the third week in March and extends to the end of the second semester, for which 1½ credits will be allowed. Registration for this course should be arranged with the second semester's registration in February.

Any student completing a single third of the course will be allowed separate credits.

POULTRY HUSBANDRY

JAMES DRYDEN, Professor

ARTHUR CLIFFORD McCULLOCH, Instructor

In recognition of the importance of the poultry industry, and to meet the demands of students who aim to give special attention to this industry after leaving college, the department of Poultry Husbandry was established. Poultry keeping is a part of every well-regulated system of diversified farming, and at the same time offers opportunity for profit-making as a special business under special conditions. The two poultry plants at the College offer opportunities for study of the practical as well as the theoretical side of the poultry industry.

Equipment. The equipment of this department consists of a number of poultry houses of different types; about 1,000 fowls of several breeds and varieties; twenty incubators of several different makes; brooders of different types; hatching, brooding, and colony coops; bone and clover cutters; fattening batteries; trap-nests; and various other appliances necessary for practical poultry keeping. A recent valuable addition is forty standard exhibition coops mounted on movable tables. These are used in judging poultry from the utility standpoint. There are also sets of charts, lantern slides, motion pictures and photographs, illustrating breeds of fowls, poultry farms, and houses.

COURSE IN POULTRY HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Poultry Husbandry (P. H. 1, 2).....	4	4
Embryology and Histology (Zool. 104, 105).....	3	3
Anatomy of the Fowl (Vet. Med. 12).....	2	
Poultry Diseases (Vet. Med. 12).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Ins. 1, 2).....	1	1
Approved Electives	3	6
	—	—
	17	17

	Senior Year	Semester	
		1st	2nd
National Government (Com. 320).....		3	
State and Municipal Government (Com. 322).....			3
Advanced Poultry Husbandry (P. H. 3, 4).....		5	5
Genetics (Zool. 120).....		3	
Farm Management (Agron. 505).....			3
Approved Electives		6	4
		<hr/> 16	<hr/> 16

The following courses are offered:

1. Poultry Husbandry. Includes a study of breeds of domestic poultry, their history, and classification. Laying and market qualities of different breeds are emphasized. Breeding fowls for different purposes will be considered, as will the location and construction of the poultry plant and its equipment. Laboratory work consists of practice in judging; preparing poultry products for market; constructing houses, coops, poultry plant equipment; and drawing plans.

Required of all juniors in Poultry Husbandry; junior year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

2. Poultry Husbandry. A continuation of course 1. Includes a study of poultry feeds and feeding with reference to egg and meat production. Reproduction by natural and artificial methods, poultry breeding, markets, and marketing. Laboratory work consists of a study of poultry food stuffs and rations. Students will be given practice in preparing different rations. Practice will also be given in hatching and brooding. Each student will have charge of a pen of fowls, and during his period of management will do all the feeding and keeping of records.

Required of all juniors in Poultry Husbandry; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

3. Advanced Poultry Husbandry. For students specializing in poultry husbandry who wish to prepare for future college, experiment station, or Government work. Current poultry literature, especially reports of experimental work at other institutions, will be studied. Each student will be required to conduct some original

investigation work and prepare a thesis. To complete advanced work, each student must give evidence of ability successfully to carry on practical instruction, and investigation work in Poultry Husbandry.

Prerequisites: Poultry Husbandry 1, 2. Required of all seniors in Poultry Husbandry; senior year; first semester; 5 credits.

4. Advanced Poultry Husbandry. A continuation of course 3.

Prerequisites: Poultry Husbandry 1, 2, 3. Required of all seniors in Poultry Husbandry; senior year; second semester; 5 credits.

6. Practical Poultry Keeping. A course arranged to meet the demands of students who desire a knowledge of practical poultry keeping, but who are unable to elect a full year's course. The course includes the selection of stock; breeding farm poultry; poultry house construction and equipment; methods of reproducing the flock; poultry breeding; feeds and feeding; as well as markets and preparation of poultry products for market.

Required of sophomores in Agriculture; second semester; 2 credits; 2 lectures or recitations. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

8. Poultry Breeding. Study of origin and history of breeds and varieties of poultry. Principles of poultry breeding with special reference to the inheritance of egg production will be emphasized. Lectures supplemented with laboratory work largely in judging birds for constitutional vigor and general utility qualities, as well as a study of type among laying birds.

Elective; first semester; 2 credits; 1 lecture or recitation; 1 laboratory period.

9. Marketing Poultry Products. Study of the different classes of market poultry and eggs and how they may be improved in quality before marketing. Quality of products as affected by feeding, etc., will be considered. Selling and purchasing to best advantage. Study of markets and marketing conditions. Laboratory work will consist of judging, candling, grading, and packing of eggs, finishing, dressing, judging, grading, and packing of poultry for market, and other allied work.

Elective; junior and senior years in Home Economics; first semester; 1 credit; 1 lecture; 1 laboratory period.

* **Poultry Diseases.** (Vet. Med. 12) Elective; required of all seniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 2 laboratory periods; second semester.

* **Anatomy of the Fowl.** (Vet. Med. 11.) Elective; required of all juniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 1 laboratory period; first semester.

A. Poultry Husbandry Optional Course. Arranged to meet demands of students unable to take the degree course. Students will be given practice in judging poultry, feeding laying and fattening birds, caponizing, operating incubators, feeding and rearing chicks, etc., as well as assisting in general work about the department. Practical work supplemented with lectures and recitations in class room.

Vocational course in Agriculture; first semester; 3 credits. Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

B. A continuation of course A, but may be taken separately. Second semester; 3 credits Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

* These two courses are given as Vet. Med. 11 and 12.

SOILS AND FARM MANAGEMENT

HENRY DESBOROUGH SCUDDER, Professor
CHARLES VLADIS RUZEK, Assistant Professor
JOHN EDWARD COOTER, Instructor

Soils

The soil is the foundation of all agriculture and no student in agriculture is well prepared for his work who is not fully versed in his knowledge of it.

The purpose of the courses in Soils is to give the student a thorough training in this important phase of agriculture, making him competent for his work on the farm or preparing him for positions in state or federal service.

Equipment. A large soil laboratory is equipped with the necessary apparatus for the complete study of the physical properties of soil and problems of soil management. Ample desk room, supplied with running water, gas, compressed air, and electricity, is available. Electric centrifuges and shakers, electric bridge for alkali testing, electric air baths, analytic and torsion balances, microscopes, blast lamps, aspirators, percolators, capillary tubes,

mulch cylinders, soil sieves, scales, solution balance, compression filters, soil-sampling tubes, etc., form part of the equipment for the work in Soils. Soil surveying and mapping outfits, soil survey charts of the United States, and a collection of samples of the chief soil types of Oregon and the United States, are available.

A Soil Preparation room equipped with benches, soil-grinding and sifting machinery, and ample space for the drying, preparation, and storage of large quantities of the different soil types used in the laboratories, is available.

An Exhibit Room has been provided and equipped with exhibit cases and racks for displays of the soil sample collections, subsoils, hardpans, soil analyses, soil colors, etc.

A well-stocked reference library is available. The Experiment Station farms at Corvallis and in other parts of the State, together with the cooperative trials in different counties, offer opportunity for field study of soil problems.

COURSE IN SOILS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77. For students desiring to major in Soils the following course is recommended for the junior and senior years.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Forage Crops (Farm Crops 9).....	2	
Cereal Crop Lectures (Farm Crops 7).....	2	
Agricultural Bacteriology (Bact. 501, 502).....	3	3
Land Drainage (Drain. & Irr. 1).....		3
Soil Chemistry (Chem. 503).....	3	
Soil Physics (Soils 3).....		4
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	2	5
	<hr/> 17	<hr/> 17

Senior Year	Semester	
	1st	2nd
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Agricultural Geology (Min. 171).....	3	
Soil Fertility (Soils 7).....	4	
Crop Improvement (Farm Crops 15).....		3
Farm Management (Farm Mgt. 1).....		3
Soil Surveying (Soils 13).....		2
Approved Electives	6	5
	<hr/> 16	<hr/> 16

The following courses are offered:

1. **Soils.** The origin, formation, and classification of soils; a study of the physical properties of soil moisture, heat, and air; the effects of tillage, drainage, and irrigation. The plant foods and soil fertility, fertilizers, crop rotations, and manures. Acid and alkali soils.

Prerequisites: Chemistry 100 and 101. Course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Lyon, Flippin and Buckman, Soils.

2. **Soils.** Continuation of the course outlined under "Soils 1." Course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Lyon, Fippin and Buckman, Soils.

3. **Soil Physics.** Advanced study of the geology of soils, with their origin, formation, physical composition, and classification. Soil moisture and moisture movements and conservation. The various physical processes of the soil — surface, tension, osmosis, capillarity, diffusion, etc. The effects of the various crops and the different methods of culture upon the texture, aeration, temperature, and moisture of the soil, and the resulting alteration in crop-producing power. The influence of washing, drainage, and irrigation upon soils. Work in the laboratory will consist of the determination and comparison of such physical properties in the various soil types as, specific gravity, water retention, capillarity, organic content, etc.; the physical effect of mulches, rotations, and cropping; soil sampling and judging; the mechanical analysis of soils.

Elective; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Mosier and Gustafson, Laboratory Manual.

5. Soil Physics, Elective. Similar to course No. 3, but shorter, dealing with the more important phases of the subject. Designed as an elective for agricultural students unable to take the regular course in Soil Physics, and for students in Irrigation Engineering.

Elective; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Mosier and Gustafson, Laboratory Manual.

7. Soil Fertility. Advanced work in the composition and values of fertilizers and barnyard and green manures, and the maintenance and improvement of fertility by the use of the same. The effect of the various crops and different systems of farming upon the fertility of the soil. Crop rotations and fertility in different sections of the State and the United States. The productivity and best use of the different types of Oregon soils, their plant food requirements and comparative values, and methods of improvement of each. Field plot and pot culture investigations. Where necessary, the laboratory work may be omitted and the lecture work only taken (see Soils 9).

Elective; senior year; first semester; 4 credits; 3 recitations; 1 laboratory period. Fee \$1.00. Deposit \$2.00.

9. Soil Fertility Lectures. Same as Soils 7 except no laboratory work.

Elective; senior year; first semester; 3 credits; 3 recitations. Fee \$0.50.

11. Dry-Farming Tillage. One of the special courses given in Dry Farming, others of which are described under Field Crops as Semi-Arid Crop Production, and under Farm Management as Semi-Arid Farm Management. This course takes up the advanced study of the subject of moisture conservation, special tillage methods and machinery, soil and climatic conditions, etc., in dry-farming regions, with particular reference to Oregon and the Northwestern states.

Prerequisite: Soils 3 or 5. Elective; junior or senior year; second semester; 1 credit; 1 recitation.

13. Soil Surveying. For the advanced student who wishes to specialize in Soils for service in the state experiment stations

or the Government Bureau of Soils. The course includes some advanced study of the classification of soils and soil areas of the United States, of Oregon, and of the Northwest, but most of the time is devoted to work in the field, making regular and completed soil surveys of assigned areas, with a report thereon.

Prerequisite: Soils 3 or 5. Elective; senior year; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

15. Advanced Soil Work. The advanced student specializing in Soils may study the various soil types of Oregon through mechanical analysis, and other physical tests; may undertake field work in soil surveying and mapping; or, through wire-basket, pot-culture, and field-plot tests, may determine the effects of various systems of cropping, or fertilizing, or of soil bacteria, upon soil fertility.

Prerequisites: Soils 3 and 7. Elective; senior or graduate year; either semester; 2 to 5 credits. Fee \$1.00. Deposit \$2.00.

16. Advanced Soil Work. Continuation of course 15.

Elective; senior or graduate year; either semester; 2 to 5 credits. Fee \$1.00. Deposit \$2.00.

A. Farm Soils. A brief history of the origin of soils; the fertility of soils; the most valuable chemical constituents; their exhaustion and replenishment; the most important physical factors; their deterioration or improvement. The physical components; their relative value and amounts in soil mixtures. Practice in judging the chief soil types of Oregon. The effects upon soils of tillage, manuring, crop rotation, drainage, and irrigation.

Vocational course; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Whitson and Walster, *The Soil*.

Farm Management

No matter how expert the student may become in the various lines of agricultural production, his success as a farmer is not assured unless the organization and management of his farm as a whole, as a profitable business enterprise, is capably done.

The course in Farm Management is designed especially: first, to give the student a broad, well-rounded training in all the phases of agriculture that will prepare him for successful production, but with emphasis laid upon those studies which will fit him best for successful management of the home farm; second, to prepare students for positions as farm managers or for state or federal service in farm management investigational and extension work.

COURSE IN FARM MANAGEMENT

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77. For students desiring to major in Farm Management the following course is recommended for the junior and senior years.

	Semester	
	1st	2nd
Junior Year		
Forage Crops (Farm Crops 9).....	2	
Cereal Crops, Lectures (Farm Crops 7).....	2	
Agricultural Economics (Com. 219).....	3	
Typewriting (Com. 410-a).....	1	
Practical Pomology (Hort. 102).....	2	
Gen. Farm Mechanics (F. Mech. 1).....	2	
Land Drainage or Irrigation Farming (Drain. & Irr. 1 or 3).....		3
Soil Physics (Soils 3).....		4
Farm Power Machinery (F. Mech. 3).....		3
Diseases of Live Stock (Vet. Med. 14).....		3
Technical English (Eng. 141).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Summer Field Course — 5 credits (See Farm Mgt. 5).....		
	17	17
Senior Year		
Soil Fertility, Lectures (Soils 9).....	3	
Introductory Entomology (Ento. 301).....	2	
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Field Crops (Bot. 105).....	1	
Economic Organization of Agriculture (Com. 264).....	3	
Accounting and Management of Cooperative Enterprises (Com. 130)	3	
Advanced Farm Management (Farm Mgt. 7).....		3
Soil Surveying (Soils 13).....		2
Dairy Herd Management (D. H. 40).....		3
Feeds and Feeding (A. H. 23).....		3
Extempore Speaking (Eng. 104).....		2
Approved Electives	2	3
	16	16

The following courses are offered:

1. Farm Management. Farm Management deals with the organization and management of the farm as a business enterprise. It concerns itself especially with those factors which affect the labor income. The chief subjects covered in this course are: types of farming, selection and purchase of the farm, requirements as to capital investment and distribution, size and diversity of business, farm rental and leasing methods, management of man and horse labor, farm-equipment costs and duty, cropping systems on different types, maintenance of soil-fertility as a farm management problem, farm-equipment costs and duty, cropping systems of different systems of farming, farm and farmstead layout and building arrangements, production costs, marketing in relation to farm management, the study of successful and unsuccessful farms. Whenever possible, short field trips are taken. Students desiring to strengthen their work in this course may do so by taking laboratory work to accompany it, registering in Advanced Farm Management (Farm Management 13), 1 credit, for this purpose.

Elective; junior or senior year; second semester; 3 credits; 3 lectures. Fee \$1.00.

3. Semi-Arid Farm Management. A study of the farm management problems of the dry farmer and irrigation farmer, and the preparation of management plans dealing with fertility, rotations, equipment, labor distribution, forms of production, marketing, etc., as adapted to semi-arid conditions. When circumstances permit, a field excursion into the dry farming and irrigated sections of Oregon for farm survey work, will be made.

Prerequisite: Farm Management 1. Elective; senior year; first semester; 1 credit; 1 lecture. Fee \$0.50.

5. Farm Management Field Course. A course for students specializing in Farm Management. The object of the course is two-fold: first, to increase the student's knowledge of the practical application of the principles of Farm Management, through direct study and analysis, in the field, of some of the most successful farms in the State; second, to give the student training in regular farm-management survey work.

In the summer of the junior year, following the close of the College in June, the group of students registered in this course, accompanied by the instructor, spends four or five weeks in the field in various representative sections of the State, devoting about

one week to each section. All of the time during the day is spent in the company of the farm owner in the study of his individual farm and its methods, a complete record being taken, and in the evenings this record is analyzed.

In order to reduce expense and increase the efficiency of the work, camp equipment is provided and field camp maintained throughout the period, the student paying only his living and traveling expenses.

Prerequisite: Farm Management 1. Elective; junior year; 5 credits; field work.

7. Advanced Farm Management. In this course students in Agriculture who have taken or are taking the lecture work in Farm Management 1 are offered opportunity to do laboratory or field work, applying the principles of the subject in working out problems in which they are especially interested, such as those connected with the home farm or home region or a future farm under certain known conditions.

Students specializing in Farm Management will register in this course for laboratory and field work as indicated above but on a more extensive scale and with wider range, including advanced reading in the literature of the subject.

Elective; junior year, second semester; or senior year, either semester; 1 to 5 credits. Fee \$0.50.

9. Seminar. A course for advanced and graduate students only. Discussion of investigational methods, analysis of data, new literature, special problems, etc.

Elective; senior or graduate year; second semester; 1 credit; fortnightly meetings.

11. Accredited Farm Work. The object of this course is to offer opportunity for the furtherance of the student's training in Farm Management through a period of actual experience obtained on a highly developed farm where the practical application of the principles of good management are in successful operation. Advanced or graduate students who have taken the regular four-years course in Farm Management or its equivalent and who have previous good records of practical experience in farming and the necessary personal qualifications as to character, industry, etc., may register in this course. Such students will be assisted to secure places as workmen on "accredited" farms—farms operated by progressive and successful farmers—known to the College as following the best practices in production and management. In ad-

dition to gaining actual experience, the student will be required to study the organization, management, methods, costs of production, methods of solution of special problems, etc., on this farm, and make written report upon the same. He will be visited, his work being inspected by the instructor and reported upon by the farm owner. The College credit given the student for a year on such a farm will depend upon the quality of his practical work and the extent and quality of his study of the organization and management as evidenced in his written reports.

Senior or graduate year; 8 to 16 credits. Fee \$1.00.

13. Graduate Work. Under this head all graduate work in Farm Management is registered. Graduate work in this field divides itself into the two phases indicated below. Selection should be made according to the work the student desires to prepare himself for.

a. Research. For the student who wishes to prepare himself for investigational and instructional or extension work in Farm Management. With the development of Farm Management throughout the country as a distinct science or branch of agriculture, opportunities are opening up for men in either instructional or investigational or extension work in both state and federal service. Problems of wide diversity are available for thesis subjects, ranging from the reorganization and preparation of management plans for unsuccessful farms to the study of efficiency factors in special regions, such as on dry-land or irrigated areas, on marsh or diked lands, on drainage reclamation areas, on distinct soil types, etc. The minor courses required in connection with research problems are taken in residence one or both semesters and the major work in residence or in the field.

b. Practical Management. For the student who wishes to prepare himself more thoroughly as a farm manager, one year registered in the course Accredited Farm Work (Farm Management 11) combined with one semester's work in residence graduate work, is suggested.

Elective; graduate year; either semester; credits to be arranged.

14. Graduate Work. Continuation of course 15 through the second semester's work.

Elective; graduate year; either semester; credits to be arranged.

A. Practical Farm Management. The chief factors bearing on successful farming, such as the type of farming, size of business, use of capital, handling of labor, proper equipment, cropping systems, marketing, etc., are given consideration from the practical standpoint. The laboratory work deals with the solution of the home-farm problems.

Vocational course; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50.

VETERINARY MEDICINE

BENNETT THOMAS SIMMS, Professor
FREDERIC WILLHELM MILLER, Fellow

The object of the courses in Veterinary Medicine is to prepare the students to recognize disease, treat emergency cases, diagnose and control outbreaks of infectious diseases, and take care of sick animals.

Equipment. This department has its office, laboratory, and lecture room on the second floor of the Dairy building. Laboratory equipment includes mounted skeletons of the horse and cow, complete sets of loose bones, dissected specimens preserved in museum jars, rotary microtome with accessories, microscope, electric oven, electric thermostat, steam and hot air sterilizers, the necessary glassware for physiological laboratory work, and the necessary instruments and drugs for clinical work.

The following courses are offered:

1. **Comparative Anatomy.** Anatomy is taught in the most practical manner possible. Special attention is paid to the digestive systems of the horse and cow; to the foot, the muscles of locomotion, and the teeth of the horse. The laboratory work includes complete dissection of the digestive, urinary, genital, and respiratory systems, and partial dissection of the circulatory, muscular, and nervous systems.

Prerequisites: Zoology 108, 109. Chemistry 500, 501. Junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$2.00.

2. **Comparative Physiology.** The study of the functions of the body. Special attention is paid to the digestive system. The physiological processes of all the domestic animals are studied, with special emphasis on the horse and cow. The laboratory work

consists of practical experiments which are correlated with the lectures.

Prerequisite: Veterinary Medicine 1. Junior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$1.00.

3. Diseases of Live Stock. The parasitic, infectious, and non-infectious diseases of domestic animals are considered in this course. Special attention is given to the presentation and control of parasitic and infectious diseases. The laboratory work consists of a free clinic, which provides an abundance of both medical and surgical work. The students assist in handling and diagnosing the medical cases, and in operating on the surgical cases. They also observe the results of treatment of all animals in the hospital.

Prerequisites: Veterinary Medicine 1 and 2. Senior year; first semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

4. Diseases of Live Stock. A continuation of course 3.

Senior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

5. Veterinary Histology. The histology of the domestic animals.

Elective; junior or senior year; first semester; credits to be arranged. Fee \$1.00.

6. Veterinary Histology. A continuation of course 5.

Elective; junior or senior year; second semester; credits to be arranged. Fee \$1.00.

11. Anatomy of the Fowl. A study of the structure of the body of the fowl. The laboratory work consists principally of dissection.

Fee \$0.50.

12. Poultry Diseases. The parasitic, infectious, and non-infectious diseases are considered. Special emphasis is placed upon methods of prevention and control of parasitic and infectious diseases. Students observe autopsies, methods of diagnosis, and treatment of fowls.

Junior or senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

14. Diseases of Live Stock. A one-semester course for Agronomy students. The more common diseases, with the methods of prevention and control, are considered. The laboratory work consists of a free clinic, which provides an abundance of animals for both surgical and medical treatment.

Prerequisites Zoology 108, 109. Chemistry 500, 501. Junior or senior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

A. Diseases of Dairy Cattle. A practical course given to the Dairy Husbandry students who are taking the vocational course. Vocational students; first semester; 2 credits; 2 recitations.

B. Diseases of Dairy Cattle. A continuation of course A. The laboratory work consists of a free clinic. The students observe methods of diagnosis and treatment of both medical and surgical cases.

Vocational students; second semester; 2 credits; 1 lecture; 1 laboratory period. Fee \$0.50.

C. Diseases of Domestic Animals. A practical course given to Animal Husbandry students who are taking the vocational course. The laboratory work consists of a free clinic, which provides an abundance of animals for treatment.

Vocational students; first semester; 2 credits; 1 lecture; 1 laboratory period. Fee \$0.50. Text: P. B. Hadley, *The Horse in Health and Disease*.

ZOOLOGY AND PHYSIOLOGY

GEORGE FRANCIS SYKES, Professor
*ALICE LEORA EDWARDS, Instructor
ASA CHANDLER, Instructor
CHARLOTTE NEVIL HURD, Instructor
HOWARD MARSHALL WIGHT, Instructor

The interests of human life are so intimately bound up in the facts of animal life that today, at least, a general knowledge of the science of Zoology is considered a personal asset few students can afford to omit from their college course. The instruction in this department, therefore, is designed not only to awaken interest in the study of native birds, insects, and other animals in order to afford a basic knowledge of the structure and functions of the animal body, but particularly to develop the faculty for determining the dynamic value of an animal, or a group of animals, in the solution of the problems of everyday life.

By means of lectures, laboratory work, and field observations, the student becomes familiar with the form and habits of various representatives of the animal kingdom, learning something of the mechanism of living things, of their importance as active

* On leave of absence (1916-1917).

forces in nature, and of the biological laws according to which their development is regulated. The work is adapted, so far as possible, to the particular needs of students in Agriculture, Forestry, Pharmacy, and Home Economics.

Opportunity is offered, moreover, to those who desire it, to receive training for teaching zoology, physiology, or nature study in the public schools; for development of the game and food resources of the State; or for the pursuance of studies in the field of research. In connection with the course in Pharmacy, the required work forms a valuable pre-medical course.

Equipment. The laboratories of the department occupy the following rooms on the third floor of Agricultural Hall; offices, physiological laboratory, laboratory for embryology and histology, general laboratory for zoology, lecture room, vault, and photographic dark room. The general laboratory is equipped with desks with individual drawers to accommodate 280 students; each desk is provided with compound microscopes, dissecting microscopes, and various minor pieces of apparatus. The physiological laboratory is similarly equipped for 225 students and in addition is provided with an articulated skeleton, a dissectible human skull, a complete Azoux model of the human body, greatly enlarged Azoux models of the brain, eye, ear, and other organs, a set of the celebrated Leuckart zoological charts, and a good supply of specimens and dissections for illustrating the work in physiology. The laboratories are provided with high-grade compound and dissecting microscopes, a Minot rotating microtome, paraffin bath, eye piece and stage micrometers, and an abundant supply of minor instruments.

As an adjunct to the laboratory facilities a set of nursery troughs for fish cultural purposes has been erected on the campus adjacent to the zoological laboratory.

The museum contains, in addition to a beautiful collection of native birds, a small collection of mounted mammals, the Ladd collection of bird skins, a large collection of eggs of native birds, a small collection of fishes and reptiles, a considerable number of marine invertebrates, including a small but beautiful collection of Philippine shells, and numerous specimens of a miscellaneous nature.

COURSE IN ZOOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75-77.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
* Electives	13	13
	—	—
	16	16

The following courses are offered:

101. General Zoology. A general introduction to advanced courses in the department; designed also for students who, without intending to pursue the subject further, desire a general view of zoological work and its problems; lectures and laboratory work supplemented by collateral reading and field investigation, gives general knowledge of different animal forms; distribution; habits; mechanism and functions of body; introduction to laboratory methods of dissection and experiment; outline of biological theories of selection, adaptation, and evolution. Runs throughout the year.

The courses in Pharmacy, Physical Education, and for Pre-medical students; freshman year; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

102. General Zoology. A continuation of 101.

Prerequisite: Zoology 101. The courses in Pharmacy and Physical Education; freshman year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

103. Functional Zoology. A brief course designed to give students in Home Economics some conception of the structure and

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

physiological activities of animals, as a basis for the work in Physiology. The work consists of a general survey of the forms and activities of living organisms, with general reference to the human organism.

The course in Home Economics; freshman year; first or second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. (Not given 1917-18.)

104. Embryology and Histology. The origin and development of the animal body; the elementary structure of the adult organs and tissues; a study of the chick and pig with reference to other animals and man; practice in micro-technique, killing, fixing, imbedding, sectioning; adapted to the requirements of the general student as well as to those intending to study Veterinary medicine.

Prerequisites: Zoology 101, 102; or 108, 109; or the equivalent. For students in Agriculture, Pharmacy, Physical Education, and other courses; junior or senior year; first semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each. Fee \$2.00. Deposit \$3.00.

105. Embryology and Histology. A continuation of course 104.

Prerequisite: 104. For students in Agriculture, Pharmacy, Physical Education, and other courses; junior or senior year; second semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each. Fee \$2.00. Deposit \$3.00.

106. Game Propagation. A laboratory and reading course, supplemented by field work in the propagation of food animals of the field and forest; the breeding and protection of game birds and mammals; methods of conducting game reservations; and a comparative study of game laws.

Elective for students in Agriculture and Forestry; first semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged. Fee \$0.25.

107. Ornithology. A lecture course and field study of the common birds of Oregon; the course aims to develop an interest in the native birds, their habits, and haunts, with particular reference to their usefulness.

Elective; second semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged. Fee \$0.25.

108. Principles of Economic Zoology. Designed for both students in Agriculture and in Forestry; the facts and conditions that

render animal life an important factor in the economic problems of life; prefaced by a study of animal forms, distribution, and habits. The physiological functions of the body. Lectures, laboratory work, and collateral reading.

Required of Agricultural and Forestry sophomores; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

109. Principles of Economic Zoology. Continuation of course 108. A dynamic interpretation of life; contact in the field with vital economic problems, agricultural or sylvan. An outline of the different biological theories, natural-selection, adaptation, cultivation; acquaintance with their fundamental principles leading to an insight into the more far-reaching significance of every-day problems.

Prerequisite: 108. Required of Agricultural and Forestry sophomores; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

110. Animal Parasites. An advanced course for the study of such parasitic forms as flukes, tapeworms, nematodes, fish "lice," cattle ticks, etc., that affect the health of man, and of domestic and food animals; the study will be primarily ecological, the object being to obtain a more exact knowledge of the conditions which produce parasitism, to the end that by intelligent control, diseases and economic losses may be rendered less liable, and preventive measures made productive of more permanent results.

Prerequisites: Zoology 101, 102; or 108, 109, or the equivalent.

Elective to students in Agriculture, Forestry and Pharmacy, Veterinary Bacteriology; junior or senior year; first semester; 2 credits; hours to be arranged. Fee \$1.00. Deposit \$1.00.

111. Protozoology. An advanced course for the study of microscopic animals with a view to their relation, beneficially or injuriously, to man, particular attention being paid to such pathogenic forms as blood spores and enteric parasites, with some reference to soil protozoans and water animalcules.

Prerequisites: Zoology 101; or 108, or the equivalent. Elective for students in Agriculture, Pharmacy, Aquiculture, and Bacteriology; second semester; 2 credits; hours to be arranged. Fee \$1.00. Deposit \$1.00.

112. Research and Thesis. Opportunity will be given students who desire to specialize in Zoology and Physiology to take up work not given in the regular courses, or to undertake the investigation

of special problems. Work for the master's degree, either as a major or as a minor in this department, may be selected. It is the policy of the department to allow the student to develop his own initiative in the selection of a problem, and in outlining and conducting his investigations, but with the cooperation of the head, or other member, of the department.

Elective for seniors and graduates; first semester; credits to be arranged.

113. Research and Thesis. A continuation of course 112.

Elective for seniors and graduates; credits to be arranged. Deposit \$3.00.

114. Aquiculture. Lecture, laboratory, and field course dealing with the problems and methods of sea-farming and fish culture; the hatching and rearing of fish and other aquatic food animals, the planting and care of oyster and clam beds, and a study of the various methods of production and preparation for market.

Prerequisite: Zoology 108, or the equivalent. Elective for Agriculture and Forestry students; first semester; 3 credits; hours to be arranged. Fee \$1.50. Deposit \$1.00.

115. Aquiculture. A continuation of 114.

Elective for Agriculture and Forestry students; second semester; 3 credits; hours to be arranged. Fee \$1.50. Deposit \$1.00.

116. Taxidermy and Zoological Collecting. Lecture, laboratory, and field course in the methods involved in the preparation of skins, the preservation of museum specimens, and a study and practice of the methods involved in field survey work.

Prerequisite: Zool. 108, or the equivalent. Elective for Agriculture and Forestry students; second semester; credits to be determined; hours to be arranged. Fee \$1.50. Deposit \$1.00.

120. Genetics. A lecture course dealing with the general principles of heredity, and the factors involved in variation and inheritance; the fundamental principles of breeding. The course will be prefaced by lectures on the phenomena of reproduction; and will be followed by an explanation of the mechanism of heredity, involving a discussion of problems of inheritance of acquired characters, segregation, dominance, and sex determination, with respect to their application both to the human and to the domestic forms. Experimental problems may be outlined for practical investigation for those who may desire to carry on such work.

Elective for juniors in Agriculture and others; first semester; 3 credits; 3 lectures; 1 laboratory period of 1 hour. Fee \$0.25.

201. Physiology and Anatomy. Intended not only for the general student, but also for students particularly interested in this branch of Zoology, and for those who expect to study medicine; a study of the structure, significance, and function of the human body, with reference to the animal body in general; the laboratory course includes some work upon the gross anatomy and the histology of the various tissues and organs of a typical mammal; also includes experiments and demonstrations with foods, the study of blood, nerve, muscle, reactions, etc.

Prerequisites: Zoology, 101, 102, or the equivalent. Physical Education freshman, Pharmacy sophomores; elective for other students; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

202. Physiology and Anatomy. A continuation of course 201.

Prerequisites: Zoology 101, 102, 201. Pharmacy sophomores; elective for other students; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

204. Physiology and Hygiene. A general course designed primarily to give Commerce students a practical knowledge of the functions and care of the human body in every-day life. The laboratory will be of such nature as to furnish demonstrations of the physiological principles.

Elective to Commerce in conjunction with Bacteriology 101; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

205. Nutritional Physiology. An advanced course dealing particularly with the process of digestion, absorption, nutrition, secretion and excretion.

Prerequisites: 207, 208; or the equivalent. Elective for students in Home Economics and others; senior year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Deposit \$3.00.

207. General Physiology. The object of this course is to give to the Home Economics student the knowledge of life processes and anatomical relationships which will be most useful in maintaining the highest efficiency of the human mechanism; the chief functions of the human body and the laws of health falling naturally within the province of the physiologist, including such experimental, histological, and anatomical work as will best serve the object of the course.

Home Economics; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

208. General Physiology. A continuation of 207.

Home Economics; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

209. Neuro-Physiology. An advanced course dealing with the special processes and anatomical relationships of the nervous system; an examination of the physiological bases of mental states; experimentation in neuro-muscular reactions; studies in animal behavior. Prerequisites: 100, 102, 201, 202, or the equivalent. Elective; Pharmacy and other students; first semester; 2 credits; 1 lecture; 1 laboratory period of three hours. Deposit \$3.00.

A. Elementary Physiology. For the women of the Home-makers' course; an elementary study of the process and organs of digestion, circulation, excretion, reproduction, etc. The physiological basis of the laws of hygiene.

Required of women in the Home-makers' course; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

THE SCHOOL OF COMMERCE

JOHN ANDREW BEXELL, Dean

The School of Commerce offers two distinct courses of study; namely, (1) a four-years course leading to the degree of Bachelor of Science in Commerce; (2) a two-years vocational course leading to a Certificate. The practical side of every subject is especially emphasized, the constant aim being to train the student for service and efficiency.

The Degree Course. In the degree course all freshmen follow the same schedule; in the sophomore year, however, the student may choose as a major either accounting or secretarial studies, the latter including stenography and office practice. In the junior year, the student may further select a major course from one of the following: (1) Accounting and Business Management, (2) Economics and Sociology, (3) Government and Business Law, (4) Secretarial Studies. Instead of the above options, a liberal range of general electives is offered, so that in the junior or senior year the men may elect courses in Agriculture, Forestry, or Industrial Arts, while the women may elect courses in Home Economics.

The Vocational Course. This course has been arranged primarily for the benefit of persons who have been unable to finish a high-school course. The only entrance requirements are that the applicant must have had an eighth-grade education, or its equivalent, and must be at least eighteen years of age. The student may emphasize bookkeeping and business methods, or stenography and typewriting; or he may have an opportunity to take both courses.

Departments. For administrative purposes, the School of Commerce is organized into four distinct departments: (1) Accounting and Business Management, (2) Economics and Sociology, (3) Government and Business Law, and (4) Stenography and Office Training.

REQUIREMENTS FOR GRADUATION IN THE SCHOOL OF COMMERCE

For graduation in the school of Commerce a total of 136 college credits must be completed by men, and 132 credits by women. It is expected that the suggested schedule as listed elsewhere for

this school will be closely followed. Before graduation a student must complete credits as indicated in the following groups:

General group, such as English, Modern Language, etc., at least 22 credits.

Natural Science group at least 6 credits.

Commerce group at least 66 credits, as follows: Accounting and Business Management 21; or Office Training 21; Economics 21; Government and Business Law 18; Business English 6.

Mathematics group at least 3 credits.

Gymnasium 2 credits for men; 6 credits for women.

Military Science 2 credits for men.

Military Drill 6 credits for men.

Free Electives 29 credits.

DEGREE COURSE IN COMMERCE

	Semester..	
	1st	2nd
Freshman Year		
Accounting (Com. 100, 101)**.....	3	3
Stenography (Com. 400, 401)*.....	4	4
Advanced Commercial Correspondence (Eng. 143) or Modern Language	3	
Technical Business English (Eng. 142).....		3
Commercial Geography (Com. 200)**.....	3	
Economic History of Europe (Com. 208).....		3
Commercial Mathematics (Math. 8).....	3	
Contemporary American History (Hist. 62).....		3
Library Practice (Lib. 1).....	$\frac{1}{2}$	
Hygiene (Ph. Ed. 10).....	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Gymnasium (Phys. Ed. 5, 6).....	(1)	(1)
Drill (Military 3, 4).....	1	1
	<hr/>	<hr/>
	18 $\frac{1}{2}$	17 $\frac{1}{2}$

* Or Science. See requirements for Graduation.

** Students who have not had elementary accounting should register for course 107 in addition to 100, and omit course 200.

	Semester	
	1st	2nd
Sophomore Year		
Modern English Prose (Eng. 81, 82) or French, German or Spanish	3	3
Economic History of The United States (Com. 206).....	3	
Principles of Economics (Com. 210).....		3
Advanced Business Law (Com. 309, 310).....	3	3
Accounting (Com. 102, 103) or Stenography (Com. 402, 403)	4	4
History of Oregon (Hist. 70)*.....	3	
Modern European History (Hist. 40)*.....		3
Gymnasium (Phys. Ed. 17, 18).....	1½	1½
Gymnasium (Phys. Ed. 7, 8).....	(1)	(1)
Drill (Military 3, 4).....	1	1
	<hr/> 17½	<hr/> 17½

Junior Year **

Money and Banking (Com. 230).....	3	
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Business Organization and Management (Com. 110).....	3	
Advertising and Selling (Com. 112).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Practical Sociology (Com. 250).....		3
Free Electives (6-6) (See groups).....	6	6
	<hr/> 17	<hr/> 17

Senior Year **

Public Finance (Com. 233).....	3	
Transportation (Com. 240).....		3
Comparative Study of Governments (Com. 325).....		3
International Relations (Com. 302).....	3	
Free Electives (10-10) (See groups).....	10	10
	<hr/> 16	<hr/> 16

* Optional with science or second year in Accounting or Office Training.

** The junior and senior schedules may be modified to suit the individual student, provided, that the entire course shall contain not less than 66 nor more than 75 credits in professional subjects, and not less than 39, nor more than 61 credits in non-professional subjects.

Freshman Year, Second Semester Registration **

	Semester	
	1st	2nd
Accounting (Com. 100).....		3
Modern English Prose (Eng. 82)		3
Advanced Commercial Correspondence (Eng. 143).....		3
Principles of Economics (Com. 210).....		3
Economic History of Europe (Com. 208).....		3
Typewriting (Com. 411) or.....		2
Stenography (Com. 400).....		(4)
Gymnasium (Phys. Ed. 16).....		$\frac{1}{2}$
Gymnasium (Phys. Ed. 6).....		(1)
Drill (Military 4).....		1
		<hr/>
		18 $\frac{1}{2}$

Note: Six credits in sciences are required for graduation. The following are recommended: Chemistry 100, 101, Physics 1, 2, Bact. 101, Zoology 204, or Botany 20.

VOCATIONAL COURSE IN COMMERCE**First Year**

Vocational English (Eng. G, H).....	3	3
U. S. History (Hist. D).....	3	
Civics (Com. N).....		3
Stenography (Com. 400, 401) or.....	4	4
Office Training and Typewriting (Com. 410, 411, S).....	(2)	(2)
Penmanship (Com. U, V).....	(2)	(2)
Commercial Arithmetic (Math. M, N)	3	3
Bookkeeping (Com. B, C).....	3	3
Gymnasium (Phys. Ed. 11, 12).....	$\frac{1}{2}$	$\frac{1}{2}$
Gymnasium (Phys. Ed. 5, 6).....	(1)	(1)
Drill (Military A, B).....	1	1
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

** For irregular students after consultation with the Dean.

	Semester	
	1st	2nd
Second Year		
Advanced Vocational English (Eng. I, J) or.....	3	3
Stenography (Com. 402, 403).....	(4)	(4)
Business English (Eng. M, N).....	3	3
Accounting (Com. 100, 101).....	3	4
Elementary Commercial Geography (Com. H).....	2	
Elementary Industrial History (Com. K).....		2
Business Law (Com. P).....	3	
Elementary Industrial Problems (Com. J).....		3
Penmanship (Com. W, X).....	1	1
Gymnasium (Phys. Ed. 13, 14).....	$\frac{1}{2}$	$\frac{1}{2}$
Gymnasium (Phys. Ed. 7, 8).....	(1)	(2)
Drill (Military C, D).....	1	1
	<hr/>	<hr/>
	16 $\frac{1}{2}$	17 $\frac{1}{2}$

First Year, Second Semester Registration

Vocational English (Eng. H).....	3
Bookkeeping (Com. B).....	3
History of Commerce (Com. 205).....	3
Civics (Com. N).....	3
Penmanship (Com. V).....	2
Typewriting (Com. 411) or.....	(4)
Stenography (Com. 400).....	(4)
Gymnasium (Phys. Ed. 12).....	$\frac{1}{2}$
Gymnasium (Phys. Ed. 6).....	(1)
Drill (Military B).....	1
	<hr/>
	17 $\frac{1}{2}$

SUGGESTED ELECTIVE GROUPS

While the student may choose other subjects than those enumerated below, he is strongly urged to adopt one of the suggested groups.

Group 1. Accounting and Business Management Semester

	Junior Year	
	1st	2nd
Commercial Pharmacy (Phar. 160).....	3	
Labor Problems (Com. 213).....		3
Practical Public Speaking (Eng. 105, 106).....	3	3
	<hr/>	<hr/>
	6	6

	Semester	
	1st	2nd
Senior Year		
Accountancy Problems (Com. 105).....	3	
Public Accounting and Auditing (Com. 106).....		3
General Psychology (Ind. Ed. 101).....	3	
History of Education (Ind. Ed. 120).....		3
Economic Organization of Agriculture (Com. 264).....	3	
Insurance (Com. 235).....		3
Business Lecture and Reading Course (Com. 140, 141)....	1	1
	<hr/> 10	<hr/> 10

Group 2. Economics and Sociology

Junior Year		
American Literature (Eng. 71, 72) or.....	3	3
Modern Language		
Cooperation (Com. 260).....		3
Science	3	
	<hr/> 6	<hr/> 6

Senior Year		
Accountancy Problems (Com. 105).....	3	
Public Accounting and Auditing (Com. 106).....		3
Insurance (Com. 235)		3
Practical Public Speaking (Eng. 105).....	3	
General Psychology (Ind. Ed. 101).....	3	
History of Education (Ind. Ed. 120).....		3
Lecture and Reading Course (Com. 140, 141).....	1	1
	<hr/> 10	<hr/> 10

Group 3. Government and Business Law

Junior Year		
History of English Literature (Eng. 61, 62).....	3	3
Economic Organization of Agriculture (Com. 264).....	3	
Insurance (Com. 235).....		3
	<hr/> 6	<hr/> 6

	Semester	
	1st	2nd
Senior Year		
Advanced American Government (Com. 304).....	3	
Practical Legislation (Com. 328).....		3
History of the British Empire (Hist. 52).....	3	
American Diplomatic History (Hist. 80).....		3
Accountancy Problems (Com. 105).....	3	
Public Accounting and Auditing (Com. 106).....		3
Lecture and Reading Course (Com. 140, 141).....	1	1
	—	—
	10	10
Group 4. Teachers' Course		
Junior Year		
General Psychology (Ind. Ed. 101).....	3	
Educational Psychology (Ind. Ed. 102).....		2
Principles of Education (Ind. 131).....	3	
History of Education (Ind. Ed. 120).....		3
Lecture and Reading Course (Com. 141).....		1
	—	—
	6	6
Senior Year		
Special Methods (Ind. Ed. 180, 181).....	2	2
Business Organization and Management (Com. 110).....	3	
Labor Problems (Com. 213).....		3
Approved Electives	5	5
	—	—
	10	10
Group 5. Minor in Agriculture		
Junior Year		
Soils (Soils 1).....	3	
Crop Production (Farm Crops 1).....		3
Approved Electives	3	3
	—	—
	6	6
Senior Year		
Stock Judging (A. H. 1).....	2	
Live Stock Management (A. H. 2).....		3
Plant Propagation (Hort. 105).....		2
Orchard and Garden Practice (Hort. 103).....	2	
Approved Electives	6	5
	—	—
	10	10

Group 6. Minor in Home Economics

	Semester	
	1st	2nd
Junior Year		
Food Preparation (D. S. 101).....	3	
Food Preparation (D. S. 102).....		3
Approved Electives	3	3
	—	—
	6	6
Senior Year		
Dressmaking (D. A. 201).....	3	
Dressmaking (D. A. 202).....		3
Approved Electives	7	7
	—	—
	10	10

Note.—If the student has not already six college credits in Science he should register according to Note concerning requirement for graduation page 173, in the Junior or Senior year.

Group 7. Office Training

Junior Year		
Office Training for Stenographers (Com. 412).....	3	
Secretarial Training for Stenographers (Com. 413).....		3
Approved Electives	3	3
	—	—
	6	6
Senior Year		
Reporters' Course (Com. 404).....	2	
Reporters' Course (Com. 405).....		2
Approved Electives	8	8
	—	—
	10	10

Group 8. Minor in Physical Education for Women *

Junior Year		
Theory of Gymnastics (Phys. Ed 41, 42).....	2	2
Massage (Phys. Ed. 47, 48).....	1	1
Physical Examination & Prescription (Phys. Ed. 49, 50)	1	1
Physical Education—Practice.....	2	2
	—	—
	6	6

* Note: Prerequisites for this course are Zoology, Physiology and Anatomy (201, 202).

	Semester	
	1st	2nd
Senior Year		
Methods and Practice Teaching (Phys. Ed. 51, 52).....	2	2
Playground (Phys. Ed. 53).....		2
Home Nursing D. S. 511).....		3
General Psychology (Ind. Ed. 101).....	3	
Basketry D. A. 402).....	2	
Story Telling (Eng. 192, 193).....	1	1
Physical Education—Practice.....	2	2
	—	—
	10	10

COURSE IN FARM BUSINESS AND RURAL LEADERSHIP

For the prescribed group courses for the freshman and sophomore years see Degree Courses in Agriculture, Group I, page 75-76.

Junior Year		
Economic History of the U. S. (Com. 206).....	3	
Rural Finance (Com. 265).....		3
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Genetics (Zool. 120).....	3	
Practical Sociology (Com. 250).....		3
Cooperative Accounting and Management (Com. 130).....	3	
Dairy Herd Management (D. H. 40).....		3
Soil Fertility (Soils 7).....	4	
Feeds and Feeding (A. H. 23).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	—	—
	18	17
Senior Year		
Public Finance (Com. 233).....	3	
Comparative Governments (Com. 325).....		3
Economic Organizations of Agriculture (Com. 264).....	3	
Rural Sociology (Com. 252).....		3
Literature and Exposition of the Rural Life (Com. 255).....	3	
Farm Management (Farm Man. 1).....		3
Forage Crops (Farm Crops 9).....	2	
Elementary Laboratory Bacteriology (Bact. 102).....		2
Practical Pomology (Hort. 102).....	2	
Approved Electives	3	5
	—	—
	16	16

COURSE IN MARKETING AND RURAL ORGANIZATION

	Semester	
	1st	2nd
Freshman Year		
Business English (Eng. 143, 142).....	3	3
Modern Languages	3	3
Commercial Geography (Com. 200).....	3	
Economic History of Europe (Com. 208).....		3
Science	3	3
Commercial Mathematics (Math. 8).....	3	
Accounting (Com. 107).....		3
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
<hr/>		
Sophomore Year		
	17 $\frac{1}{2}$	16 $\frac{1}{2}$
Practical Public Speaking (Eng. 105, 106).....	3	3
Modern Languages (Continuation).....	3	3
Economic History of United States (Com. 206).....	3	
Principles of Economics (Com. 210).....		3
Soils (Soils 1, 2).....	3	3
Accounting (Com. 103).....	4	
Office Training (Com. 410).....		4
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 5, 6).....	1	1
<hr/>		
Junior Year		
	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Business Management (Com. 110).....	3	
Farm Crops (Farm Crops 1).....		3
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Business Law (Com. 309, 310).....	3	3
Farm Management (Farm Man. 1).....	3	
Elements of Dairying (D. H. 1).....		3
Animal Husbandry, Stock Judging (A. H. 1).....	2	
Live Stock Management (A. H. 2).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
<hr/>		
	16	17

	Semester	
	1st	2nd
Senior Year		
Markets and Marketing (Com. 283, 284).....	3	3
Economic Organization of Agriculture (Com. 264).....	3	
Rural Finance (Com. 265).....		3
Transportation (Com. 240).....		3
Insurance (Com. 235).....		3
Electives	11	5
	—	—
	17	17

ACCOUNTING AND BUSINESS MANAGEMENT

JOHN ANDREW BEXELL, Professor
 JOHN B. HORNER, Professor of History
 ERWIN BERTRAN LEMON, Instructor
 RUSSEL MARION HOWARD, Instructor

The distinctive work of the department of Accounting and Business Management in the School of Commerce is to train men and women for efficient business management. This includes thorough courses in the various phases of Accounting, Auditing, Business Organization, Scientific Management, Advertising, and Salesmanship.

While the courses in Accounting and Business Management are primarily designed to fit students for the countinghouse and business office, including banking, it is found that such positions are generally only stepping stones to more advanced positions of trust and responsibility. A large percentage of the commercial students eventually engage in business of their own.

The School of Commerce has taken a leading part in developing courses in business methods especially adapted to the farm, the home, and cooperative enterprises. Such courses are given not only in residence but also by correspondence.

When it is remembered that every vocation has its business side, and that this phase of all pursuits is receiving increasing attention, it is apparent that the avenues of employment and the chances for promotion by the really competent business expert are almost unlimited. As a preparation for law or public accounting, this course, combined with economics and political science, is especially attractive. A large proportion of the graduates in Commerce find employment as teachers of commercial subjects in state and private schools; to them the courses in business management are very important.

Equipment. The department of Accounting and Business Management occupies the top floor of the east wing of Agricultural Hall. It is completely equipped for thorough and efficient work in modern business courses. Each room is specially designed and furnished for the work to be conducted in it. The furniture of the department consists of individual desks and counters, a complete set of modern banking fixtures, a wholesale house, a retail house, a commission house, freight, real estate, and insurance offices. Permanent blank books, letter files, rubber stamps, copying presses, college currency, blanks and similar material are provided by the College. A Burroughs Adding Machine is in constant use in the department. The room for typewriting contains twenty standard machines, each provided with approved conveniences for the operator. The room for stenography is furnished with tables designed for conveniences in practical work, as well as in equipment for illustrating various systems of filing.

COURSES IN ACCOUNTING AND BUSINESS MANAGEMENT

For outline of courses in Accounting and Business Management consult pages 174-175.

The following courses are offered:

100. Principles of Accounting. Modern accounting as practiced in the best business establishments of the country, forms the basis of the course. The use of special columns, controlling accounts, and their adaptations, is carefully studied. Labor saving devices of all kinds are studied with a constant view to secure greater accuracy and to diminish work. A great deal of practice in retail, wholesale, and commission accounting, and the preparation and interpretation of financial statements is required. In connection with partnership accounts, a careful study is made of opening and closing entries; adjustments of profits and losses; consolidation of firms; changing from partnership to single proprietorship, and vice versa. The practical side of every phase of the course is emphasized by various sets of books which the student prepares under the supervision of the instructor.

Prerequisite: Course C or equivalent. Commerce; *freshman year; Vocational Course, second year; either semester; 3 credits; 1 recitation; 4 laboratory periods. Fee \$1.00. Text: Miner, Complete Bookkeeping.

* Freshmen who have not had Course C or equivalent, desiring to enter this course, may do so by registering for Course 107 and carrying both courses simultaneously.

101. Practical Accounting. (a) **Corporation Accounts.** A presentation of the theory of manufacturing bookkeeping and the preparation of a set of books illustrating corporation bookkeeping as applied to manufacturing business. (b) **Bank Accounting.** A thorough course in modern bank accounting. The organization of private, state, and national banks, trust companies, and other financial institutions. (c) **Short Accounting Systems.** A further study of the use of special column books and filing devices, with reference to the saving of time and labor in bookkeeping, as applied to modern business houses. The practical work also consists of the preparation of sets of books illustrating the principles involved.

Commerce; freshman year; Vocational Course; second year; either semester; 3 credits; 1 recitation; 4 laboratory periods. Prerequisite: Course 100 or equivalent. Fee \$1.00. Text: A large number of practical problems and exercises selected from various sources.

102. Accounting and Business Practice (a) **Theory of Accounting** including depreciation, reserves, and investment accounting; advanced form of final statements; the statement of affairs and deficiency account; realization and liquidation. (b) **Business Practice.** The business practice course is designed to supplement all the theoretical courses and to develop initiative and originality. The offices are thoroughly equipped with modern labor-saving appliances, such as filing devices, loose-leaf books, adding machines, duplicating devices, etc. U. S. Office of Markets, Elevator Accounting and Organization of Cooperative Enterprises.

Prerequisite: Course 101. Commerce; sophomore year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Texts: Miner, Banking Set. Klein, Elements of Accounting. U. S. D. A. Bulletins.

103. Accounting and Business Practice. This course covers the broader economic phases of accounting. Emphasis is laid on accounts as a means of administrative control and economy of production. (a) **Theory of Cost Accounting.** The elements of costs; cost and stock records; relation of cost accounts to the financial records; distribution of overhead; cost statements; graphical representation of costs. (b) **Factory Costs.** A laboratory course especially adapted to a manufacturing business with a considerable pay-roll. (c) **Farm Costs Accounts.** A system of cost accounts

adapted to the farm or any productive enterprise. (d) **Business Practice.** A continuation of Course 102.

Prerequisite: Course 102. Commerce; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Wildman, Principles of Cost Accounting. Klein, Elements of Accounting. U. S. D. A. Bulletins.

105. Accounting Problems. In the efficient administration of a business of some magnitude, the accounting department is of first importance. In it, difficult problems arise, which require not only accounting skill, but judgment and executive ability. This course covers a large variety of practical problems viewed from the standpoint of the manager rather than the accountant. The material is drawn from certified public accountancy examinations and other sources. The student does not follow any prescribed form of treatment or solution, but is expected to develop analytical initiative, resourcefulness, and originality.

Prerequisite: Course 103. Elective; senior year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Text: Cox, C. P. A. Problems. Original Exercises.

106. Public Accounting and Auditing. (a) **Public Accounting.** This course embraces a study of accountancy as a vocation; the C. P. A. laws of the various states are studied and compared; an analysis and interpretation of accounts and financial statements; terminology and procedure in public systems form an important part of this course. (b) **Auditing.** The duties and responsibility of the auditor; his function in the executive staff; his relation to the accounting department; different classes of audits; investigation in the conduct of utility corporations, municipalities, and public institutions. Typical audits will be studied and compared.

Prerequisite: Course 105. Elective; senior year; second semester; 3 credits; 3 recitations; 1 laboratory period. Text: Montgomery, Auditing in Principle and Practice. Harvard Bulletins.

107. Bookkeeping. A thorough but rapid study of the general principles of bookkeeping. The aim of this course is twofold; first, to prepare the student for the study of an advanced set of books adapted to his particular vocation; second, to afford those students entering the Degree Course in Commerce who have not had a year of bookkeeping an opportunity to secure additional instruction which will enable them to carry Course 100. In the latter case, the student should register for both Course 107 and Course 100.

Commerce and Elective; freshman year; first semester; 3 credits; 1 recitation; 4 laboratory periods. Fee \$1.00. Text: Miner, Complete Bookkeeping.

108. Special Accounting. In this course the student is given an opportunity to apply the principles of accounting to his special needs, the course being designed primarily for engineering students. Cost accounting, and corporation accounts and statements receive special attention.

Prerequisite: Course 107 or equivalent. Electrical Engineering Course (elective to others); freshman year; second semester; 1 recitation; 2 laboratory periods.

109. Farm Accounting and Business Methods. (a) **Farm Accounting.** This part of the course consists of a thorough discussion of a system of accounts suited to the farm. Cost accounting is especially emphasized, with a view to determining the results of different enterprises. (b) **Business Organization.** Individual proprietorship, partnership, joint stock companies, and corporations are carefully studied and their adaptations discussed from the standpoint of efficiency; the status of stockholders; the rights and obligations of bondholders; and the functions of officers and directors are treated in detail.

Agriculture; sophomore year; first semester; 2 credits; 2 recitations. Texts: Bexell and Nichols, Principles of Bookkeeping and Farm Accounts. Robinson, Organizing a Business.

110. Business Organization and Management. (a) **Business Organization.** General nature of business organization; evolution and forms; structure and life-history of typical corporations; the corporation and trust problem; public utility corporations; reorganization and receivership; blue sky laws and state control. (b) **Parliamentary Practice.** A brief discussion of parliamentary practice and procedure as applied to corporate business. (c) **Business Management.** This part of the course emphasizes internal organization for the purpose of securing efficiency; departmental organization and coordination; various systems of scientific management are studied and compared.

Commerce; junior year; first semester; 3 credits; 3 recitations. Text: Haney, Business Organization. Gowin, The Executive and His Control of Men.

111. Thesis. A research course and treatise on the organization and management of a business in which the student is

especially interested. The subject of the thesis must be chosen at the time of registration, and a complete outline approved by the professor in charge not later than November 1. When the thesis is approved, a bound (either printed or typewritten) copy must be deposited in the College library.

Prerequisite: All College courses in Accounting and Business Management. Open only to seniors; both semesters; 1 credit each semester.

112. Purchasing and Selling. (a) **Purchasing.** Principles of purchasing; relations of buying to successful merchandising and manufacturing; ethics of buying; the purchasing organization; records of purchasing; stores, their function and operation; markets; agents; brokers; jobbers; wholesalers; transportation; reports and statistics. (b) **Advertising.** A study of the fundamental principles of modern advertising. Special emphasis is given to the peculiarities of composition in newspaper and circular advertising, proof reading, effectiveness of design, illustration and display, follow-up systems, etc. (c) **General Principles of Salesmanship.** Business ethics; wholesaling and retailing; brokerage and commission; specialty selling; the sale of service; planning a selling campaign; special sales; prices; correct buying.

Commerce; junior year; second semester; 3 credits; 3 recitations. Texts: Twyford, Purchasing. Neystrom, Retail Selling.

120. Household Accounts. A course dealing with the business side of the household. The family income and its distribution; the planning of the annual budget; a simple but complete system of household accounts based on the budget; private accounts as a basis for encouraging thrift among members of the family; bank accounts and their relation to household finance; savings and how they grow.

Home Economics; sophomore year; first semester; 1 credit; 1 recitation.

122. Business Management for Women. The aim of this course is to treat in a practical way the ordinary rules and methods of conducting business affairs. Two distinct phases are emphasized as follows: (a) **Finance.** Value of money, how savings grow, banking and credit, general principles of investment, loan associations, bonds, stocks, and insurance. (b) **Fundamentals of Business Law.** The principles of the law of contracts, of negotiable paper, mortgages, real property, and wills.

Home Economics; elective to juniors and seniors; second semester; 2 recitations. Text: Cromwell, American Business Woman.

130. Accounting and Management of Cooperative Enterprises. This course covers the business management of cooperative societies. It includes such subjects as the organization of the employees; structure of buildings; office arrangement and equipment; correspondence and filing; bookkeeping and cost accounting especially adapted to different types of cooperative associations in the United States, such as creamery associations, cow-testing associations; auditing, banking, and finance; purchasing, advertising, selling; depreciation of assets; conduct of membership meetings; annual reports and audits; statistical analysis of operations.

Farm Management; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Text: Robinson, Organizing a Business. U. S. Bureau of Markets Bulletins.

140. Business Men's Lectures and Reading. (a) **Lectures.** A series of lectures on practical business subjects will be given during the year by prominent business men of the State. Following is a tentative list of subjects during the present year: Present Problems in Finance; Organization of a Bank; Organization of a Railroad; Organization of a Department Store; Advertising and Selling; Buying Merchandise; The Fishing Industry of Oregon; The Lumber Industry of Oregon; The Business Side of Farming; Commercial Expansion of the United States; Duties and Responsibilities of the Bank Cashier; Education for Business; Business Opportunities in Oregon. Various topics in Business Law and Insurance will be discussed by specialists. (b) **Reading.** An assignment of reading will be made at the beginning of the semester covering such phases of the lectures as are best suited to the needs of individual students.

This course is open to all students of the College. To obtain credit complete notes must be submitted on the lectures and assigned readings, and an examination taken on the course. Ten lectures; first semester; 1 credit.

141. Business Men's Lectures and Reading. A continuation of course 140. Second semester; 1 credit; ten lectures.

150. Forestry Accounting. (a) A brief, intensive study of the fundamental principles of double-entry accounting. The theory of debit and credit, labor-saving features, controlling accounts and their adaptations. The purpose of this course is to give the student the necessary foundation for the second part of the course, which deals with the lumber industry.

(b) This part of the course will consider especially those systems of accounts, forms, and records, which are adapted to the lumber industries. Cost accounting and statements receive especial attention. It is not intended to make of the student a professional accountant, but rather to teach him accounting as a means of control and the proper methods of analyzing the different operations connected with the business.

Logging Engineering; freshman year; elective second semester; three credits; 2 recitations; 1 laboratory period.

160. Military Business Practice. A study of the business methods and accounting in the United States Army as represented by its blanks and forms, and the regulations governing the use of the same. The business methods of the Supply and Adjutant General Department will be analyzed and compared with those used in civil life. Considerable outside reading will be required to obtain credit in this course.

Open to all juniors and seniors; second semester; 2 credits; 1 recitation; 1 laboratory period.

B. Bookkeeping. The aim of this course is to give the student a thorough foundation in the fundamental principles of bookkeeping. The theory of debit and credit, modern books of original entry, closing a set of books, and the preparation of statements, receive much attention. The subjects of partnership, shipments, and consignments are also introduced.

Vocational Course; first year; either semester; 1 recitation; 4 laboratory periods. Fee \$1.00. Text: MacFarland and Rossheim, A first year in Bookkeeping and Accounting.

C. Bookkeeping. Continuation of Course B. Elementary problems in the preparation, analyzing, and checking of balance sheets and financial statements; the distinction between capital and revenue; the use of controlling accounts and columnar books is carefully treated.

Vocational Course; first year; second semester; 3 credits; 1 recitation; 4 laboratory periods. Fee \$1.00. Text: same as course B.

D. Dairy Accounting. The same general course as E, except that in the last third of the course special attention will be given to the development of a system of accounts suited to the dairy business.

Dairy Vocational Course; second semester; 3 credits; 2 recitations; 1 laboratory period. Texts: Bexell and Nichols, Principles of

Bookkeeping and Farm Accounts. I. C. S., Cost Accounting. Robinson, Organizing a Business.

E. Farm Accounting and Business Methods. (a) **Accounting.** Students who are not acquainted with the elements of double-entry bookkeeping will be required to work out several practice sets and master the theory of accounts before taking up farm accounting. (b) **Business Methods.** A thorough course in the essentials of business methods required on a well-managed farm. Financial accounts and statements, cost accounts and special records, business methods, business organization, business correspondence and forms; household and personal accounts.

This course may also be taken by correspondence.

Agriculture; Vocational Course; second semester; 3 credits; 4 recitations. Texts: Bexell and Nichols, Principles of Bookkeeping and Farm Accounts. Robinson, Organizing a Business.

F. Shop Accounting. A course in the theory and practice of accounting especially adapted to the shop. Sufficient time is devoted to the fundamental principles of bookkeeping to familiarize the student with the use of special columns and various labor-saving devices. A special set of books adapted to the shop is then studied and prepared, making the course exceptionally practical.

Mechanic Arts; third year; second semester; 2 credits; 2 recitations. Text: Miners, Bookkeeping. Original exercises.

U. Penmanship. Students entering the first year are expected to have acquired a good hand in the grades, but considerable time is devoted during the first year to mastering the best form of business writing and lettering.

Vocational Course; first year; either semester; 2 credits; 2 recitations.

V. Penmanship. A continuation of Course U.

Vocational Course; first year; second semester; 2 credits; 2 recitations.

W. Advanced Penmanship. Special emphasis is laid on rapid business writing, correct forms of business papers, lettering, and designing.

Vocational Course; second year; first semester; 1 credit; 1 recitation.

X. Advanced Penmanship. A continuation of Course W.

Second semester; 1 credit; 1 recitation.

ECONOMICS AND SOCIOLOGY MARKETS AND RURAL ORGANIZATION

HECTOR MACPHERSON, Professor
LOUIS AUGUST RUFENER, Assistant Professor
NEWEL HOWLAND COMISH, Instructor
GUILFORD LANSING HURD, Instructor

The work of this department of the School of Commerce serves a three-fold purpose:

(1) **The training of men and women for citizenship.** Every citizen has business relations requiring a knowledge of the fundamental principles of political economy. Then, too, the necessity of such knowledge is especially felt in a democracy where every man and woman has the right to vote, and is called upon to mold legislation directly. The basis for intelligently exercising this paramount duty of citizenship can only be supplied by a training in economics and sociology the problems of which form the subject matter of all legislation.

(2) **To provide courses supplementary to the various branches of applied science.** To the agricultural college belongs the special task of developing the field of Agricultural Economics and Rural Sociology. It is the aim of this department to provide the necessary training for teachers in these subjects, to prepare specialists for research work in economic and social surveys of rural communities, and to equip those who will make a life work of organizing farmers' associations for the more economical conduct of the business side of farming.

(3) **Field Work.** The Bureau of Organization and Markets. At its meeting October 9, 1914, the Board of Regents established the Bureau of Organization and Markets for the purpose of assisting farmers in the marketing of their products.

The work of the bureau is, in the first place, investigational. It aims to find out the conditions fundamental to successful marketing, and to place the results of its investigation at the disposal of all who are interested.

In the second place, it is at the service of any group of farmers contemplating the establishment of any sort of business organization. It has worked out model constitutions and by-laws and standardized systems of accounting; it has lists of equipment and can guide the farmers to where such equipment can be most cheaply obtained. It will also assist organizations in planning the kind of plants necessary to carry on their business.

Equipment. The department has for some years been developing a commercial museum for use in the various courses in economic and social science. The museum has now grown to such an extent that it is a very important factor in making the work of the department practical and successful. The Bureau of Organization and Markets also has a collection of bulletins, pamphlets, lantern slides, and documents illustrating the farmers' marketing and organization movement in all parts of the world.

GRADUATE COURSES IN AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

Courses will be outlined leading to the degree of Master of Science in Agricultural Economics and Rural Sociology. It is strongly recommended that students wishing to pursue this work, take the Agricultural course during their first two years in College, and that they follow the work outlined in the course in Farm Business and Rural Leadership on page 182, during their junior and senior years.

Students taking the regular Commercial course, who contemplate studying for a Master's degree in Agricultural Economics and Rural Sociology, should commence with their sophomore year to take certain courses in Agriculture which will be chosen in consultation with the deans of the schools of Agriculture and Commerce.

Our aim is to make the graduate work in this course fit students for County Agriculturists, positions in the U. S. Department of Agriculture, especially in the office of Markets and Rural Organization, teachers in rural High Schools, and for Rural Leadership in general. Students will also be prepared for Civil Service examinations in this general field.

For outline of courses in Economics and Sociology in the School of Commerce consult page 175.

The following courses are offered:

ECONOMICS

200. Commercial Geography. The fundamental conditions underlying all industry and all commerce are taken up in detail. First of all basic elements as climate and topography are investigated, as they mold transportation and commerce and the production of animal and vegetable products. Then the natural resources

of the different countries of the world are treated with especial emphasis upon those of the United States.

Specimens from the Commercial Museum will be used by the students in making reports on the production and manufacture of the principal raw materials and their relation to the development of the countries from which they come. The course presupposes a fair knowledge of physical and political geography and of general history.

Freshman Commerce, freshman Industrial Engineers, sophomore Mechanical Engineers; first semester; 3 credits; 3 recitations. Text: Smith, Commerce and Industry.

205. Economic History of the United States. This course follows and develops out of the previous work in Commercial Geography and the History of Commerce. On the basis of a knowledge of our natural resources and of the previous commercial and economic development of the world, we attempt to outline and interpret the economic progress along many lines which has been made by the United States. The development of agriculture, the growth of manufacturing, the improvement of transportation, the history of labor organization and legislation, the evolution of our monetary and credit systems, changes in the protective tariff, etc., are traced from Colonial times onward.

Prerequisites: Commerce 200, 205. Sophomore year; first semester; 3 credits; 3 recitations. Text: Bogart, Economic History of United States. Callender, Economic History of United States.

208. Economic History of Europe. The development of commerce from the time of the Phoenicians. The commercial achievements of some of the early nations. The industrial development of Great Britain, as a basis for the study of the United States, in course 206, including the rise and breaking down of feudalism, important changes in agriculture, Guild system, rise of the factory system, and its results, the market system, and England's present industrial position.

Freshman year; second semester; 3 credits; 3 recitations. Texts: De Gibbins, Industry in England. Bland, Brown and Tawney, Select Documents in English Economic History.

210. Principles of Economics. A general course covering the elementary problems of our industrial and commercial organization, including the nature of wealth, its production and consumption, and the different forms in which it is found; the conditions underlying its success in agriculture and manufacturing; the localization

of industry and the relation of raw material to manufacturing; the law of diminishing returns; division of labor and efficiency in production; exchange and distribution and their dependence upon the price-making process, the factors determining prices, wages, interest, and rent; the problems of taxation; public expenditures; protection and free trade; money and banking; labor problems and transportation.

Textbook, lectures, and reports on assigned readings.

Prerequisites: 200 and 206. Forestry; junior year; first semester; Commerce and Engineers, sophomore year; second semester; 3 credits; 3 recitations. Text: Ely, Outline of Economics. Brown, Questionnaire and Syllabus.

211. Principles of Economics. A course especially adapted for students in Home Economics. Not open to Commerce students.

Home Economics; junior year; first semester; 2 credits; 3 recitations. Texts: Ely, Outline of Economics. Brown, Questionnaire and Syllabus.

213. Labor Problems. Begins with a brief historical review of the rise of a labor class. The influence of occupation upon the laborer; and the different types of labor and the problems involved in the occupations represented by the several technical departments of the College, will be studied. Then follows the beginnings of organization; the structure, aims, methods of offence and defence, and achievements of associations of labor. The trade agreement, the strike, the boycott, the lockout, methods of conciliation and arbitration, the application of the injunction in labor disputes, the political activity of labor organizations, employers' liability, legislation, workmen's insurance, profit sharing and cooperation in relation to labor problems, will be taken up with the aid of a textbook, lecture, and assigned readings. Studies will be made of typical historical and current labor disputes and embodied in term papers and class discussion.

Prerequisite: Commerce 210. Commerce and Forestry; junior year; second semester; 3 credits; 3 recitations. Text: Groat, Organized Labor in America.

219. Agricultural Economics. The fundamental principles of production, distribution, and consumption are taken up with especial reference to agriculture. The aim of the course is to acquaint the student with the laws of supply and demand and the influences determining them. A brief history of agricultural production is taken up, showing the growing complexity of the economic prob-

lems of taxation, transportation, marketing, etc., as the transition is made from self-sufficing, general farming to localized, commercial agriculture.

Agriculture; junior year; first semester; 3 credits; 2 recitations and one lecture (of sections combined).

230. Money and Banking. (a) **Money.** The nature and functions of money, legal tender, Gresham's law, coinage; the factors affecting prices, and their relation to business conditions; a brief history of the various forms of paper currency; silver legislation; present problems and conditions.

(b) **Banking.** Procedure in organizing state and national banks; history of banking, including our National Banking System as modified by the Federal Reserve Bank Act of 1913; the functions of banks; the preparation and analysis of bank statements; loans and the granting of credit, securities required; rediscount; duties of the various bank officers; legal principles of banking; the principles underlying foreign exchange; a comparison of our banking system with that of foreign countries.

Prerequisite: Commerce 210. Commerce; junior year; first semester; 3 credits; 3 recitations. Text: Holdsworth, Money and Banking.

233. Public Finance. An examination will be made of public expenditures, local, state, and national. For this purpose, typical financial budgets and reports will be analyzed. A history of reforms calculated to secure efficiency in these expenditures will be sketched. The various forms of taxes, customs, and fees whereby revenues are raised, will be taken up in detail and their apportionment studied in relation to the budgets previously analyzed. Present systems of land taxation will be studied in the light of proposed reforms. An attempt will be made to give the student some laboratory practice through the study of local systems of assessment and the resulting apportionment of taxes.

Commerce; senior year; first semester; 3 credits; 3 recitations. Texts: Plehn, Introduction to Public Finance. Bullock, Selected Readings in Public Finance.

235. Insurance. A course designed to cover, in a general way, the whole field of insurance. The nature and statistical basis of different kinds of insurance will be first treated. Then the application of the principles discovered to different forms of insurance, such as straight life, endowment, accident, industrial, old age, fire, live stock, hail, etc., will be taken up in detail.

Elective; junior and senior years; second semester; 3 credits; 3 recitations. Text: Assigned readings and lectures.

240. Transportation. The relation of transportation systems to industrial and commercial progress; a brief historical review of the development of systems of transportation; the organization and financing of different systems; the effects of competition in the railroad business; freight classification, and the making of rates and fares; the necessity of government control, and attempts at regulation by state and federal governments; government ownership in the light of European experience.

Senior year; second semester; 3 credits; 3 recitations. Texts: Ripley, Railroads; Rates and Regulations. Johnson and Huebner, Railroads; Rates and Traffic.

250. Practical Sociology. In this course, social theory will be subordinated to the study of practical social problems. The different social and political units, such as the family, school, church, club, city, state, and nation will be discussed in their relation to the general welfare. This will necessitate an examination of the organization, purpose, and methods of each of these functional groups, involving a discussion of the training of children, employment of women and children, marriage and divorce; the labor movement as a factor in the struggle for existence; overcrowding in city slums, and its amelioration; the causes of pauperism, immorality, and crime, with modern methods of their treatment, etc. A good general textbook will be studied and the whole field covered in class discussion and assigned readings.

Junior year; second semester; 3 credits; 3 recitations. Texts: Hayes, Introduction to the Study of Sociology. Carver, Sociology and Social Progress.

251. Practical Sociology. Course 250 especially adapted for students in Home Economics. Not open to students of Commerce. Textbook and lectures. Home Economics; junior year; second semester; 2 credits; 3 recitations. Text: Hayes, Introduction to the Study of Sociology. The Survey.

252. Rural Sociology. This course will deal with the special problems of the rural family, the rural school, the rural church, rural societies and associations, and the relation of the State to the general rural welfare. This will involve an inquiry into the prevailing ideals of the rural community regarding labor and leisure; art, literature, and music; and the necessity for recreation. Recent progress in adapting education to rural needs will be dis-

cussed. City over-crowding will be examined from the rural point of view, and the lessons which the rural community can learn from the progress made by cities in solving their problems, will be emphasized. The social and educational effects of the telephone, free mail delivery, rural press, and improved methods of agricultural production and exchange, will be discussed in detail. The best textbooks in the field will be carefully studied, and the whole ground covered in class discussion and assigned readings.

Elective; junior and senior year; second semester; 3 credits; 3 recitations.

254. National Vitality. A one-credit course, covering the general field of national vitality, its importance, the conditions underlying it and the means of maintaining such conditions. The economic and social waste due to disease, alcohol, and vice will be treated in a series of lectures by experts from different departments of the College. Outside specialists will also be secured to lecture upon particular phases of the subject. Besides taking notes on the lectures, each student will be required to make an abstract of not less than three hundred pages of assigned readings.

Elective for all students; first semester; 1 credit; 1 recitation.

Note: This course will not be given unless at least fifteen students register for it.

255. The Literature and Exposition of Rural Life. A critical study will be made of the general field of literature bearing upon rural life. Typical interpretations of rural life will be taken from the best poetry and prose. The rural press will be studied with a view to estimating its sociological and economic influence. Themes will be prepared upon current economic and sociological topics and the subject matter discussed in the class room to familiarize the student with the problems involved in the Rural Life movement.

Elective; junior and senior year; first semester; 3 credits; 3 recitations.

260. Cooperation. This course takes up the origin and development of the cooperative movement in Europe, and its introduction into the United States. It sets forth the general principles underlying the economic and social activities of cooperative associations. Then, following this, the different types of organization, the methods by which they are formed, their working plans in different enterprises, and the factors which determine their success or failure, will be studied in detail. The store, the factory, the dairy and cow-testing association, the credit organization, etc.,

will be taken up systematically, and the advantages and difficulties of cooperation will in each case receive careful analysis.

Elective to juniors and seniors who cannot take Commerce 264 and 265, and who have had considerable training in Economics. First semester; 3 credits; 3 recitations.

264. The Economic Organization of Agriculture. This course, together with 265, is designed to give a more specialized training in the economic problems of agriculture than is possible in the general course outlined under 219.

In both courses, 264 and 265, economic problems are discussed from the standpoint of the efficiency to be attained through closer organization. Existing associations of farmers both in this country and in Europe will be carefully studied by means of sample constitutions and by-laws, and also by lantern-slide illustrations of the work actually being accomplished through cooperation in Europe and America. The aim is to turn out men trained to play their part in the revolution in agricultural business methods which is now sweeping over this country.

(a) **Economic Problems of Production and Marketing.** Old methods and their weakness are examined, and the possible savings through organized business are investigated.

(b) **The Purchase of Farm Supplies.** The purchasing end of the farm business is about as important as the selling of farm products. Present methods will be taken up in detail, and the possibility of eliminating waste and duplication thoroughly discussed and illustrated.

(c) **The Problems of Transportation as Affecting the Farmer.** The economic significance of the good roads movement will be dealt with; systems of rail and water transportation will be taken up, government control discussed, and the possibility of eliminating waste through precautions on the part of the shippers pointed out.

Open to all who have had 219 or its equivalent; elective for juniors and seniors; first semester; 3 credits; 3 recitations.

265. Rural Finance. (a) **Rural Credit.** The principles of money, credit, and banking will be sufficiently studied to lay the foundation for the examination of the credit needs of the rural communities, and the most economical means of satisfying them. The reasons why farmers have been so poorly served by existing credit institutions will be investigated. The credit institutions of Europe will be compared with those of the United States; the development of cooperative credit in European countries will be carefully studied, and the present widespread movement to adapt

cooperative credit institutions to American rural conditions will be closely followed; farm credit and land settlement; colonization policies.

(b) **Rural Insurance.** The basis of insurance of different kinds will be taken up, and applied to agricultural needs; old line, mutual, and fraternal organizations will be examined from the standpoint of efficiency and safety.

(c) **Rural Taxation.** The general principles of public finance will be taken up in so far as may be necessary to lay the foundation for an intelligent discussion of rural taxation; existing systems, as well as proposed reforms, will be examined.

Open to all who have had 219 or its equivalent; elective; junior and senior year; second semester; 3 credits; 3 recitations.

270. Problem Course. Students especially interested in Applied Economics may select some problem within the scope of the work characteristic of the College, and under the direction of the instructor in charge prepare a thesis embodying the results of an investigation made during the senior year.

Elective; senior year; both semesters; 1 credit (each semester); consultation by appointment.

280. The Economics of Distribution. A seminar covering the whole subject of the distribution of wealth, preparatory to graduate and thesis work in Agricultural Economics and Rural Sociology.

Open to graduate students who have had 219, 264, and 265 or an equivalent training.

281. Continuation of Course 280. This course is required in order to receive credit for first semester's work.

Open to graduates who have had 219, 264, and 265 or equivalent training; both semesters; 3 credits; 3 recitations.

Note: This course will be given as a seminar by special arrangement.

283. Markets and Marketing. The development of marketing systems; the study of local, state, and national commercial programs and policies; commercial clubs, boards of trade, chambers of commerce, speculation organized and unorganized; foreign trade relations, the consular service, commercial treaties, tariffs, bounties, and foreign exchange.

Open to graduate students who have had Com. 280. First semester; 3 credits; credit not given for one semester's work.

284. Continuation of Course 283. This course is required in order to receive credit for first semester's work.

Open to graduate students who have had Commerce 280, or equivalent work; both semesters; 3 credits; 3 recitations.

Note: This course will not be given in 1917-18 unless demand warrants it.

H. Elementary Commercial Geography. Especially adapted for Vocational students. A general survey will be made of the fundamental conditions affecting industrial and commercial development. This will be followed by a study of the natural resources, industries, products, and commerce of the United States, and each of the principal countries of the world. Emphasis will be laid upon the reasons for the organization of industry. Materials from the Commercial Museum will be used in connection with the course.

Vocational Mechanic Arts, second year; vocational Commerce, second year; first semester; 2 credits; 2 recitations.

I. Business and Social Organizations. A discussion of the principles of better business and better living that should accompany the general improvement in farm methods, which it is the purpose of this school to promote. The general application of the economic laws of consumption, distribution, and production to the business side of farming, and the social and economic results of agricultural organization will be studied by the aid of textbook, lectures, and assigned readings.

Vocational Agriculture; first semester; 3 credits; 3 recitations.

J. Elementary Industrial Problems. Especially designed for Vocational students in Industrial Arts and Commerce. It aims to give them some insight into the economic problems with which they have to deal. A very condensed outline of the principal economic concepts will be followed by the discussion of industrial organization, labor problems, transportation, marketing, taxation, etc.

Vocational Mechanic Arts, third year; vocational Commerce, second year; first semester; 3 credits; 3 recitations.

K. Elementary Industrial History. A general but comprehensive review of the most important phases of the economic development of the United States. It will include a historical study of such topics as tariff, internal improvements, slavery, banking, industrial development, commerce and shipping, immigration and other similar topics, together with a study of present-day problems, as outlined in the press.

Vocational Mechanic Arts, second year; vocational Commerce, second year; first semester; 2 credits; 2 recitations.

GOVERNMENT AND BUSINESS LAW

ULYSSES GRANT DUBACH, Professor
CHESTER COLLINS MAXEY, Assistant Professor

The work of this department of the School of Commerce includes two divisions: business law, and government. In the business law courses, arranged to accommodate students of different preparation and needs, the department endeavors to train the students for practical business affairs, particularly to give the legal information necessary to prevent the common business errors. Special attention is given to industrial and rural problems.

In order to acquaint the student with the rudiments of court procedure, a practical case is tried by the class, the students performing all the parts.

In the courses in political science proper, the department seeks to instruct in the basic general principles of all government, the construction and operation of modern governments, with particular attention to that of the United States, the rules and principles which regulate the relations of governments with each other. The courses are planned with the purpose of equipping students for an intelligent participation in governmental affairs. The work culminates in the courses of Advanced American Government and Practical Legislation, designed to instruct in the fundamentals of law making. The work implies that as citizens, our students will take a dynamic part in the various activities of government, including law making.

For outline of courses in Political Science in the School of Commerce consult pages 177-180.

The following courses are offered:

302. International Relations. Persons concerned, rights and duties of states; territorial jurisdiction; jurisdiction on the high seas; agents of the state treaties; settlements of disputes; war and its effects; military occupation; neutrality, contraband, blockades, etc. Lectures, reports, and discussions.

Senior year; first semester; 3 credits; 3 recitations. Text: Lawrence, Principles of Public International Law.

304. Advanced American Government. This course will supplement courses 320 and 322 giving chief attention to the interpretation of our federal and state constitutions, and the relation of legislation to these constitutions. Court reports will be used liberally with a view to showing the interpretation of the rights of the

people guaranteed in our constitutions and of the powers granted to the government by these instruments.

Prerequisite: Course 320. Elective; junior or senior year; first semester; 3 credits; 3 recitations. Text: Hall's Constitutional Law is used as a basis for the course. Case briefing is required as a large part of the work.

307. Rural Law. A special course supplementary to Commercial Law 300 and 301, elaborating on such questions as fixtures, fences and inclosures, roads, easements, location of land, titles, abstracts, mortgages, legal status of crops in case of termination of lease or sale of land, insurance, irrigation, drainage, and water rights in general.

Elective; junior or senior year; 1 credit; 1 recitation.

309. Advanced Business Law. (a) Contracts in General. Formation of contracts, offer, acceptance, form, and consideration; competence of parties, consent, and legality of subject matter; operation of contracts, including limit of obligations and assignments; interpretation, rules of evidence, and construction; discharge of contracts; the agreement, performance, breach of contract, etc.

(b) Sales of Personal Property. Subject matter, passage of title, rights of third parties, warranties and remedies.

Sophomore year; first semester; 3 recitations. Text: Spencer, Manual of Commercial Law. Bays, Cases on Commercial Law.

Note: Credit will not be given for Commerce 309 without Commerce 310 except on special permission of the department.

309-a. Class work same as 309, special research work required in addition. For graduate students only.

First semester; 3 credits; 3 recitations.

310. Advanced Business Law. Continuation of course 309.

(c) Negotiable Instruments. Maker's, acceptor's, drawer's and indorser's contracts; proceedings before, upon, and after dishonor; proceedings in protesting; accommodation paper; grantor and surety; holder's position, defense, equities, etc.

(d) Partnership and Corporation Law. Comparison of methods of formation, powers, liabilities of members, and dissolution.

(e) Property. Classes, methods of acquiring and transferring titles, mortgages, and leases, landlord and tenant.

The case method is used throughout the entire course. Lectures, reports, and discussions.

Sophomore year; second semester; 3 credits; 3 recitations. Text: Spencer, Manual of Commercial Law. Bays, Cases on Commercial Law.

310-a. Class work same as 310, special research work required in addition. For graduate students only.

Second semester; 3 credits; 3 recitations.

311. **Business Law.** A short course in the laws of business. Recitations and discussions.

Pharmacy and Farm Management students; second semester; 3 credits; 3 recitations. Text: Huffcut, Elements of Business Law.

320. **National Government.** (a) **National Government.** The Constitution; rise of the American Union; distribution and powers of the Government; powers of Congress; powers of the executive; the judicial departments; checks and balances of governments; governments of territories and colonies; admission of new states; amendments to the Constitution; civil rights and their guarantees; protection of persons accused of crimes; protection of contracts and property, etc. Lectures, readings, reports, and discussions.

(b) **American Politics.** Origin of political parties in the United States; changes, growth, and development; party platforms.

Junior or senior year; first semester; 3 credits; 3 recitations. Text: Beard, American Government and Politics. Young, New American Government.

322. **State and Municipal Government.** A study of the functions of state government; the machinery of state government; political parties in state government; special study of the government of the state of Oregon; municipal government, including county, town, and city government.

Lectures, readings, reports, and discussions. Junior or senior year; second semester; 3 credits; 3 recitations. Text: Beard, American Government and Politics. Young, New American Government.

325. **Comparative Governments.** A critical study of the governments of the principal countries of the world, with special emphasis on modern movements and features of government, that are problems in the United States at present.

Lectures, reports, and discussions. Senior year; second semester; 3 credits; 3 recitations. Text: Ogg, European Governments.

326. **Practical Legislation.** The work in Advanced American Government would serve as a preparation for this course which

will instruct in practical bill drafting. Attention will be given to the correct form, and the correct expression of the desired content of bills. Emphasis will be placed on the necessity of preparing laws with reference to prior legislation and court decisions. In addition, an attempt will be made to show the necessity of studying conditions, and the possibility of guiding legislation to meet the demands of the times. Special emphasis will be placed on rural and industrial legislation.

Prerequisite: Course 304. Elective; junior or senior year; second semester; 3 credits; 3 recitations. Text: Jones, Statute Law Making in the United States.

P. Business Law. Adapted to students of limited training. A course covering the general principles of contracts, and particular contracts including sales of goods, bailment, insurance, credits, loans, negotiable instruments, agency, partnership, corporations, and property.

Vocational course; second year; and Mechanical Arts; third year; first semester; 3 credits; 3 recitations. Text: Huffcut, Elements of Business Law.

N. Civil Government and Administration. (a) **Civil Government.** Our European ancestors; origin of states and state institutions. English and American governments compared; federal and state constitutions; state and foreign service; the executive departments; federal and state power; political parties and issues.

(b) **Federal and State Administration.** A survey of the administrative activities of federal, state, and municipal governments; governments from the sociological point of view. The financial operations, preparation of budgets and reports, will be considered.

Vocational course; first year; second semester; 3 credits; 3 recitations. Text: Ashley, American Federal State.

STENOGRAPHY AND OFFICE TRAINING

HERBERT TOWNSEND VANCE, Assistant Professor
ETHA MABEL MAGINNIS, Instructor

The courses offered by this department of the School of Commerce are for four classes of students: (a) those desiring a thorough training as stenographers and typists; (b) those desiring to go still further into the field of court reporting and secretarial training; (c) those desiring to enter the teaching profession; and (d) those commercial teachers desiring advanced training.

The ground covered by the special subjects offered by this department is as follows: Stenography and Typewriting, two years; Convention and Court Reporting, one year; Secretarial Training, one year; and Methods of Teaching Commerce, one year.

Equipment. The Office Training department is well equipped with the latest appliances and fixtures, including the standard types of typewriters, duplicators, mimeographs, dictaphones, mimeoscope, and filing cabinets.

Each student is given access to equipment upon payment of a fee required for the course in which he is registered. All equipment and apparatus is kept in constant repair, and students are taught, under the direction of the instructors, how to keep the apparatus they use in proper order.

The following courses are offered:

400. Elementary Stenography and Typewriting. (a) **Gregg Shorthand.** Theory manual covered thoroughly. Shorthand penmanship given special attention. Primary, intermediate, and complete certificates granted.

(b) **Rational Typewriting.*** The theory and practice of touch typewriting, covering mastery of the alphabet, numerals, mechanical arrangement of business correspondence and legal forms, tabulating, and speed practice. Special attention is given to the mechanics of the typewriter.

Degree course, freshman year, and Vocational course, first year; either semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each. Fee \$2.00. Texts: Gregg Shorthand Manual. Gregg Writer. Rational Typewriting.

401. Elementary Stenography and Typewriting. A continuation of course 400. Speed practice finished through the principal series and phrase letters. Elementary office equipment studied and used. Typewriting speed certificates granted.

Degree course, freshman year, and Vocational course, first year; either semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each. Fee \$2.00. Text: Gregg Shorthand Manual. Gregg Writer. Rational Typewriting.

* By special permission of the instructor, 400 (b) may be omitted, with a reduction of two credits. This applies particularly to students of schools other than Commerce.

Commerce students starting Stenography, having had previous training in typewriting, will not be excused from 400 (b); lessons of an advanced character will be assigned. Credit will not be given for first semester's work in Course 400, unless the course is carried the full year.

402. Advanced Stenography and Typewriting. Dictation covering vocabularies of representative businesses, such as real estate, law and collections, banking and finance, life and fraternal insurance, publishing, railway, manufacturing, and a drill in matter qualifying one to pass the United States Civil Service examination.

The typewriting periods will be utilized in transcribing matter which has been taken in dictation. The use of the dictaphone will be introduced as an aid to increasing speed both in stenography and typewriting. 80-, 100-, and 120-word speed certificates granted.

Degree course, sophomore year, and Vocational course, second year; first semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each. Fee \$2.00. Text: Eldridge Dictation Exercises. Gregg Writer.

403. Advanced Stenography and Typewriting. A continuation of course 402. Court and convention reporting introduced. Course 413 must be taken concurrently with this course by Commerce students.

Degree course, sophomore year, and Vocational course, second year; second semester; 4 credits; 4 recitations; 4 laboratory periods of one hour each. Fee \$2.00. Text: Eldridge Dictation Exercises. Gregg Writer.

404. Reporters' Course. Designed for those having finished course 403 and desiring to specialize in court or convention reporting.

Elective; senior year; first semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each. Fee \$1.00. Text: Expert Shorthand Speed Course. Gregg Writer.

405. Reporters' Course. A continuation of course 404.

Elective; senior year; second semester; 2 credits; 1 lecture; 3 laboratory periods of one hour each. Fee \$1.00. Text: Gregg Reporter.

410. Typewriting and Office Training. Designed especially for students not enrolled in Stenography, but who desire a knowledge of Typewriting and Office Appliances. (a) **Typewriting.** The theory and practice of touch typewriting; complete training in the use and care of the typewriter. Not open to stenography students.*

(b) **General Office Methods.** Office records and systems, relations between employer and employee; office equipment and its

* Farm Management; junior year; 1 credit; 3 one-hour laboratory periods. Fee \$1.00. Text: Rational Typewriting.

efficient arrangement. Especial attention will be given to training students in office methods that apply to their particular branch of work.

Elective; all courses; either semester; 2 credits; 3 laboratory periods of 2 hours each. Fee \$2.00. Text: Rational Typewriting.

411. Typewriting and Office Training. Continuation of 410, Not open to Stenography students.

Elective; all courses; either semester; 2 credits; 3 laboratory periods of 2 hours each. Fee \$2.00. Text: Rational Typewriting.

412. Office Training for Stenographers. Designed to give such knowledge and training as is called by employers, "experience." Advanced Stenography and Typewriting. Topics covered: Attractive arrangement of business letters; applying for a position; office routine; inclosures, remittances, and banking; filing systems; office appliances; shipping information; business ethics and bibliography; legal papers and transactions; telegraph and telephone; printing and proof reading; a day's work coordinated into an organized whole. Thorough drill in the use of the dictating machines.

Junior year; first semester; 3 credits; 3 lectures; 3 laboratory periods of two hours each. Required of all taking course 402. Fee \$2.00. Text: Office Training for Stenographers.

413. Secretarial Training for Stenographers. Continuation of course 412. Actual service in the College administrative offices required. Office efficiency problems studied.

Junior year; second semester; 3 credits; 3 lectures; 3 laboratory periods of two hours each. Fee \$2.00. Text: Office Training for Stenographers.

414. Bibliography. Advanced library training for secretaries and others, in order that they may know where and how to find quickly all information regarding any important field of knowledge. Method of indexing books and general filing. Twelve lectures and problems will be given by experts in the various fields, covering the main principles, chief authorities, and the source of material.

Dewey Decimal Classification: 3 lectures and problems by the College Librarian. Subject Headings: 3 lectures and problems by the College Cataloguer. Elective; junior year; second semester; 1 credit; 1 lecture.

416 Expert Typists' Course. Designed to give expert finger training, word and sentence drills, mastery of the key-board, drills for speed and endurance, errorless typewriting. Certificates of proficiency and awards for speed and accuracy will be issued.

Prerequisite: One-year's work in typewriting. Either semester; 1 credit; 3 one-hour laboratory periods. Fee \$1.00. Text: **Rational Typewriting.**

417. Expert Typists' Course. A continuation of course 416. Special emphasis will be laid on tabulating, billing, manifolding, and mimeographing. Artistic typewriting based upon the following points: even touch, absolute accuracy, and judicious display, will be a strong feature of the course.

Prerequisite: Commerce 416. Elective; either semester; 1 credit; 3 one-hour laboratory periods. Fee \$1.00. Text: **Rational Typewriting.**

SCHOOL OF ENGINEERING AND MECHANIC ARTS

GRANT ADELBERT COVELL, Dean

The School of Engineering offers courses leading to the advanced professional degrees, the degree of Bachelor of Science, and the vocational certificate in Mechanic Arts.

Advanced Degrees. The professional degree of Civil Engineer, Electrical Engineer, or Mechanical Engineer, is offered to graduates of this College, or other colleges of equal rank, who have attained the degree of Bachelor of Science in the corresponding engineering course, and met the further requirements for graduate study laid down on pages 70-71 of this catalogue. These requirements specify one full year of resident work amounting to 32 college credits, including an acceptable thesis.

Baccalaureate Degrees. Four-years courses leading to the degree of Bachelor of Science are offered in the School of Engineering as follows:

A course in Civil Engineering, with majors in Highway Engineering, Irrigation Engineering, and Structural Engineering.

A course in Electrical Engineering.

A course in Industrial Arts.

A course in Mechanical Engineering.

Vocational Course. A three-years vocational course in Mechanic Arts is also offered. While this course does not lead to a degree, a certificate or diploma will be awarded to those students who complete it.

The Requirement for Graduation in each of the four degree courses offered in the School of Engineering is 136 college credits. These credits are mostly in the form of required subjects in the individual courses, but they may be classified in groups as follows:

GROUP	Civil Eng.	Elec. Eng.	Indus. Arts	Mech. Eng.
Professional Group	80	72	51	66
Pure Mathematics	19	18	3	18
General Science	14	18	12	14
Shop Work		8	16	13
General Subjects, including electives..	13	10	44	15
Military Science	2	2	2	2
Military Drill	6	6	6	6
Gymnasium	2	2	2	2
	136	136	136	136

It is expected that the student will closely follow the outline of the course specified in the department in which he is registered.

CIVIL, HIGHWAY, AND IRRIGATION ENGINEERING

EXECUTIVE COMMITTEE

GORDON VERNON SKELTON, Chairman
Professor of Highway Engineering

THOMAS ANDERSON HENDRICKS TEETER,
Professor of Irrigation Engineering and Hydraulics

CONDE BALCOM McCULLOUGH,
Professor of Civil Engineering

Since the Board of Higher Curricula has restored the degree course in Civil Engineering to the College, it seems best to discontinue the degree of Bachelor of Science in Highway Engineering, and in Irrigation Engineering. Hereafter students who have met all of the requirements for graduation in either of these courses will receive the degree of Bachelor of Science in Civil Engineering also naming the major subject, as B. S. in Civil Engineering, majoring in Highway Engineering, etc. The work of this entire division of Civil Engineering is organized under three department heads, each responsible for the administration of his particular department.

The Executive Committee composed of the three heads of departments, decides matters of general policy, secures coordination, and promotes general efficiency.

Equipment. In addition to joint use with the other engineering departments of the testing laboratories described elsewhere, this division has a suite of well-lighted rooms, suitably arranged on the second floor of Mechanical Hall. This suite includes an office, recitation, and lecture rooms; an instrument room, and draughting and designing rooms, together with a well-equipped blue-print room with a cylindrical electrical blue-print machine, sun frames, and washing pans.

The draughting and designing rooms are well lighted and fully equipped with thoroughly modern and convenient drawing tables, supplied with individual lockers for instruments and other apparatus. The instrument room is conveniently arranged, having an individual glass-front case for each instrument and its accompanying equipment, which includes marking pins, tape, range-poles, notebook, etc. The instrument equipment includes the following: twelve transits, four of which are provided with solar attachment; nine levels, four plane-tables, one compass and two current meters, all high-class instruments of various standard makes and styles; a sufficient supply of level and stadia rods, range-poles, tapes,

chains, plain and prismatic compasses, aneroid barometers, clinometers, planimeters, plumb-bobs, hand levels, etc., together with a well-selected assortment of specifications and blue-print plans of engineering structures for illustrative purposes.

CIVIL ENGINEERING

CONDE BALCOM McCULLOUGH, Professor
SAMUEL MICHAEL PATRICK DOLAN, Assistant Professor
DEXTER RALPH SMITH, Instructor

The purpose of the course in Civil Engineering is to give the student thorough theoretical instruction, accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, and Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department. The student has the opportunity, during the senior year, to select his work along lines that he is most interested in.

Recognizing the value of drawing to the professional engineer, not only as a means of expressing his ideas and of carrying out his plans, but also as a means by which the young graduate may enter some of the most desirable positions, the department lays special emphasis upon this subject. Much drawing is also required in connection with the preparation of plans and working drawings, as part of the office work of the higher technical courses.

The work in Surveying begins with the freshman year and continues through the sophomore year, with from six to nine hours of field practice a week. The student serves in subordinate positions at first, and gradually advances as a knowledge of the instruments is acquired. After having served his term as an apprentice, he is placed in charge of field parties and is held responsible for the results accomplished. During the freshman year he is given practice in land surveying and leveling, and during the sophomore year in topographic and railroad surveying. At all times, conscientious attention to duty, accuracy, and speed will be demanded. Every student keeps full and accurate notes of all work done in the field. These, after being criticised, are transcribed and filed with the instructor.

In addition to the specified required work a number of technical lectures will be given to freshmen by members of the engineering faculty. The purpose of these lectures is to acquaint the entering class with the general scope and purpose of the work which they have chosen as a profession.

DEGREE COURSE IN CIVIL, HIGHWAY, AND
IRRIGATION ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Spherical Trigonometry (Math. 15).....	1	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100, 101).....	3	3
Mechanical Drawing (C. E. 107).....	3	
Engineering Drawing (C. E. 111).....		3
Descriptive Geometry (M. E. 152).....	3	
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Plane Surveying (C. E. 222).....		5
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2).....	1	1
	$17\frac{1}{2}$	$17\frac{1}{2}$

Sophomore Year		
Differential Calculus, Integral Calculus (Math. 51, 52)....	4	4
Engineering Physics (Phys. 101, 102).....	4	4
Topographic Surveying (C. E. 223).....	5	
Railroad and Canal Surveying (C. E. 272).....		5
Gymnasium (Phys. Ed 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
Electives (Restricted)	3	3
	$17\frac{1}{2}$	$17\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year *		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
* Roads and Pavements (H. E. 405).....	3	
Graphic Statics (C. E. 511).....	2	
Hydraulics (I. E. 102).....		3
Cement and Highway Laboratory (Exp. E. 231).....	2	
* Structural Materials Laboratory (Exp. E. 232).....		3
Military Science (Theo. Inst. 1, 2).....	1	1
Masonry and Foundations (C. E. 552).....		3
Drill (Military 5, 6).....	1	1
** Electives (Restricted)	3	3
	17	17

Senior Year		
Engineering Seminar (C. E. 605, 606).....	1	1
Roofs and Bridges (C. E. 513, 514).....	4	4
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (C. E. 607).....		2
Municipal Water Supply (I. E. 305).....	3	
Sanitary Engineering (I. E. 702).....		3
Engineering Electives	5	6
	16	16

Senior Year		
Structural Option		
Roofs and Bridges (C. E. 513, 514).....	4	4
Engineering Seminar (C. E. 605, 606).....	1	1
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (C. E. 607).....		2
Advanced Structural Engineering (C. E. 515, 516).....	3	3
Design of Highway Structures (H. E. 415).....	2	
Advanced Materials Laboratory (Exp. E. 235).....		2
Engineering Electives	3	4

* Irrigation students in the junior year will take Irrigation Farming (Drainage and Irr. 3) instead of Roads and Pavements; and Soil Physics (Soils 5) instead of Structural Materials Laboratory.

** Approved Electives: English, Modern Language, Economics, National Government, State and Municipal Governments, Geology, Differential Equations, Least Squares.

The following courses are offered:

107. Mechanical Drawing. The use of instruments and the elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, and finally, the complete development of a working blue print of some simple device from sketches. Particular attention is given to free-hand lettering, general neatness, and accuracy.

Civil, Highway, Irrigation, and Mining Engineering; first semester; 3 credits; 3 laboratory periods. Fee \$0.50. Text: French, Engineering Drawing.

111. Engineering Drawing. A continuation and extension of the previous work in drawing, with special reference to application in Highway and Irrigation Engineering. Practice in tracing and in blue and black line process printing will be given.

Prerequisite: C. E. 107. The course in Civil, Highway, and Irrigation Engineering; freshman year; second semester; 3 credits; 3 laboratory periods. Fee \$0.50. Text: French, Engineering Drawing.

222. Plane Surveying. This course includes recitations, lectures, field and office work in the theory and practice of plane surveying. The theory and construction of the different surveying instruments are studied, and practice will be given in making their tests and adjustments. The United States public land surveys and land laws are studied. Forms of field notes, methods of balancing and plotting surveys, computing areas and like work, will have due consideration. Proper emphasis will be placed upon chain surveying. Surveys will be made of assigned plots, and descriptions prepared. Resurveys will be made where more than ordinary difficulty is encountered in the interpretation of the descriptions and existing evidence.

Prerequisite: Math. 11 and C. E. 107. The courses in Civil, Highway, and Irrigation Engineering, and Landscape Gardening; freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

223. Topographic Surveying. This course will include the execution of a complete topographic survey of an assigned tract, including the base line measurement, transit, stadia, and plane table work, plotting, and finishing the map.

Prerequisites: C. E. 222 and 107. The courses in Civil, Highway, and Irrigation Engineering, and Landscape Gardening; sophomore year; first semester; 5 credits; 1 recitation; 4 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

225. City Surveying. (Elective.) A study of the necessary precision; a survey of a portion of the city; also a new addition, including the preparation of plots, establishment of grades, etc.; survey and office work for preparation of plans for street improvement; preparation of estimates, etc.

Senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

232. Plane Surveying. In this course substantially the same ground will be covered as in course 222, except that there will be but two-thirds as much field practice.

Prerequisites: Math. 11, 21, 31, and Mechanical Drawing. The courses in Mining; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

234. Plane Surveying. An abridgment of course 222 designed to meet the requirements of students in Forestry and Logging Engineering. As much time as possible will be given to the study and use of the type of instruments used in the Forestry service. Some time will be given to the retracing of lines from original descriptions and field notes and to different methods of determining the meridian.

Prerequisites: Math. 11, and Mech. Draw. The courses in Forestry and Logging Engineering; freshman year; second semester; three credits; one recitation; 2 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

235. Topographic Surveying. A condensation of course 223. This course is designed for students in Forestry and Logging Engineering

Prerequisite: C. E. 232 or 222. The courses in Forestry and Logging Engineering; sophomore year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

242. Farm Surveying and Leveling. This course is designed for Agricultural students, and consists of problems of chaining, elementary transit work, and in leveling. Most emphasis will be put upon leveling and its application to drainage and general irri-

gation work. Problems will be given in profile and contour work as applied to farm drainage, road construction, and irrigation.

Agricultural course; freshman year; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.00. Text: Pence and Ketchum, Surveyor's Manual.

243. Topographic Surveying. This course is designed especially for those taking the Irrigation Farming course, and is an enlargement on C. E. 242. A complete topographic survey and map of an assigned area will be made. Special emphasis will be put on the study of the relation of surface topography to methods of water distribution, drainage, etc., all illustrated by an assigned survey and map. Methods of locating ditches and of making estimates on grading for the same will be studied from the contour map.

Prerequisite: C. E. 242. Irrigation Farming course; junior year; first semester; 2 credits; 2 laboratory periods with assigned lectures where required. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

252. Precise Surveying and Geodesy. A study of the precise methods of surveying and leveling, base line measurements, precise triangulation, determination of true meridian and latitude.

Prerequisite: C. E. 222, 223, 272. Elective; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00.

254. Plane Surveying. A brief course in surveying for those who do not find time to take C. E. 222, 232, or 234. Lectures, field and office practice in the care and use of surveying instruments. Transit and traverse work. Leveling and topography.

The course in Electrical Engineering; junior year; second semester; 2 credits; 2 laboratory periods. Fee \$1.00.

256. Plane Surveying. This course includes recitations, lectures, field and office work in the theory and practice of plane surveying. The theory and construction of the different instruments. Tests and adjustments of instruments. Transit and traverse work. Leveling and topography. Computation of earthwork. Computation of reservoirs, etc..

Elective; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00.

272. Railroad and Canal Surveying. This course will include a study of the simple compound, transition, and vertical curves, and of earthwork. Students will solve many problems both in the class

room and in the field, and will make a survey of a canal, highway, or railroad, including a reconnoissance, preliminary survey, location survey, and estimates of earthwork. Emphasis will be placed on yardage estimates, cross-sectioning and earthwork computations, and details of construction.

Prerequisites: C. E. 222 and 223. Civil, Highway, and Irrigation Engineering, and Landscape Gardening; sophomore year; second semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$1.00. Text: Allen, Railroad Curves and Earthwork.

274. Railroad Surveying. This course is designed especially for the Logging Engineering course, and takes up the survey of a railroad line through rough wooded country, including a reconnoissance, preliminary, and location surveys of such a line. A complete estimate of the yardage, and also of the cost of the road is made. The course also includes the study of the simple, compound, vertical, and transition curves.

Prerequisites: C. E. 223 or 233. Course in Logging Engineering; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each. Fee \$1.00. Text: Allen, Railroad Curves and Earthwork.

281. Railway Engineering. Study of the methods of railway construction and maintenance, standard structures, trestles, tunnels, culverts, minor bridges, ballast, rails and rail supports and fastenings, yards and terminals. This course will be preceded by a brief review of the simple and compound curve and the railway spiral.

Prerequisite: C. E. 272. Elective; first semester; 3 credits; 2 recitations; 1 laboratory period. Text: Webb, Railway Construction.

282. Railway Engineering. Continuation of course 281.

Elective; second semester; 3 credits; 2 recitations; 1 laboratory period. Text: Webb, Railway Construction.

511. Graphic Statics. A study of graphic analysis as applied to the determination of stresses in cranes, derricks, roof and bridge trusses, and similar problems. A study is also made of the more recent methods of graphical analysis as applied to the evaluation of four dimensional expressions.

The courses in Civil, Highway, Irrigation, and Mechanical Engineering; first semester; 2 credits; one recitation and one three-hour laboratory period. Fee \$0.50.

513. Roofs and Bridges. A study of stress analysis and design as applied to simply supported structures, including the preparation of stress diagrams, general detail drawings, shop drawings, and material bills. Trusses of the Pratt, Howe, Warren, and similar types, curved chord and subpaneled trusses, plate girder, and beam spans will be treated in this course.

Prerequisites: M. E. 251, 252. Senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each. Fee \$1.00. Text: Kirkham, Structural Engineering.

514. Roofs and Bridges. A continuation of course 513. Advanced work in highway bridge design including a treatment of "higher bridge structures." Draw spans, continuous girder and truss spans, cantilever, suspension, and arch spans of the various types are treated in this course.

Senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Johnson, Bryan, and Turneaure, Modern Framed Structures, Part II.

515. Structural Engineering. Advanced draughting room work including the preparation of detail drawings, shop drawings, material bills, etc. Preparation of itemized estimates and analysis of cost will be treated in this connection. Plans and working drawings will be prepared for roof trusses, girder spans, pin-connected and riveted bridge trusses and similar construction.

Senior year; first semester; 3 credits; 3 laboratory periods. Fee \$1.00.

516. Structural Engineering. Continuation of course 515. Draughting room and class room treatment of advanced work in structural design, including a study of the theories of internal work, secondary stress calculation and allied problems, together with a discussion of the more recently developed methods for the solution of indeterminate structures.

Senior year; second semester; 3 credits; 3 laboratory periods. Fee \$1.00.

552. Masonry and Foundations. A study of the properties of stone, brick, lime, cement, mortars, and concretes, and methods of their adaptation for use in foundations, retaining walls, piers, dams, and similar construction. Recitations, lectures, and work in the draughting and computing room.

The courses in Civil, Highway, and Irrigation Engineering; junior year; second semester; 3 credits; 3 recitations.

557. Reinforced Concrete. A study of the fundamental principles of reinforced concrete design as applied to beams, girders, columns, walls, and arches. Designs for the beam, girder, and arch types in bridge construction; also typical retaining wall and irrigation structures are worked out in the draughting room and detailed drawings made of the same. This course also includes the investigation of the elastic arch together with a study of the use of influence diagrams in arch analysis.

The courses in Civil, Highway, and Irrigation Engineering; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Text: Turneaure and Maurer, Principles of Reinforced Concrete.

605. Engineering Seminar. The members of the senior class in the courses of Civil, Highway, and Irrigation Engineering, and the professors and instructors, constitute the Engineering Seminar, which meets once a week. The purpose of this seminar is to bring the student in touch with engineering literature and practice. To this end, a number of journal reviews and papers on engineering subjects will be presented and freely criticised each week. The work will follow a previously arranged program.

Senior year; first semester; 1 credit.

606. Engineering Seminar. See course 605.

Senior year; second semester; 1 credit.

HIGHWAY ENGINEERING

GORDON VERNON SKELTON, Professor

There are few lines of public endeavor where more money is being spent, or where a higher degree of technical skill and training is required, than in the field of highway engineering. The purpose of this course is to meet the demand in this State and throughout the Northwest for men equipped to take charge of road and city street construction and maintenance work. Aside from the opportunity for useful and honorable service, no field, it is believed, offers greater encouragement in a financial way to the young man of ambition and ability.

Thorough theoretical instruction is accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, Drawing, Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department.

The department of Experimental Engineering is equipped with complete and thoroughly up-to-date testing laboratories, including the very latest and best cement- and highway-testing machinery, thus affording students in Highway Engineering and in Civil Engineering courses the opportunity of studying by direct observation and experiment the strength and properties of the various engineering materials.

In the study of highways, special reference is made to the conditions and needs of Oregon. Due consideration is given to the construction and maintenance of dirt, gravel, and broken-stone roads as well as to the higher types. In consequence of the vast area of the State, this class of roads must, of necessity, constitute the greater part of its highways for many years.

DEGREE COURSE IN HIGHWAY ENGINEERING

The prescribed courses of the freshman, sophomore, and junior years in Highway, Civil, and Irrigation Engineering are identical.

	Semester	
	1st	2nd
Senior Year		
Roofs and Bridges (C. E. 513, 514).....	4	4
Engineering Seminar (C. E. 605, 606).....	1	1
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (C. E. 607).....		2
Highway Engineering (H. E. 407, 408).....	4	4
Economics of Highway Construction (H. E. 410).....		2
Advanced Highway Laboratory (Exp. E. 233).....	2	
Engineering Electives	2	3
	<hr/> 16	<hr/> 16

The following courses are offered:

405. Roads and Pavements. A study of the fundamental principles of location, construction, and maintenance of roads, as well as a thorough study of the materials used in road and street building. Asphalt, brick, wood block, stone, concrete, and other forms of street pavements are carefully studied. This course is given in connection with a laboratory course, Exp. E. 131.

The courses in Civil, Highway, and Irrigation Engineering, and Landscape Gardening; junior year; first semester; 3 credits; 3 recitations.

407. Highway Engineering. Economic grades and proper location for different soils and surfacing materials. Surface and sub-surface drainage. Culvert design and construction. Construction and maintenance of earth, sand-clay, gravel, macadam, concrete, brick, and other types of roads. Dust preventives and road binders. Preliminary surveys and estimates. Specifications.

Senior year; first semester; 4 credits; 3 lectures; 1 laboratory period.

408. Highway Engineering. Continuation of course 40.

Senior year; second semester; 4 credits; 2 lectures; 2 laboratory periods.

410. Economics of Highway Construction. Economic and social advantages of improved roads. The traffic census. Local and centralized systems of control. Highway laws of different states. Organization of construction and engineering forces. Cost data. Methods of handling work. Forms of contract — lump sum, unit price, percentage and cost plus fixed sum.

Senior year; second semester; 2 credits; 2 recitations.

415. Design of Highway Structures. A draughting room course in the design of the various structures required in highway work. The various culvert types, short-span beam bridges, tunnels, retaining walls and similar construction, including a consideration of methods for preliminary waterway engineering, selection of type, and allied questions.

Elective; senior year; 2 credits; 2 laboratory periods. Fee \$1.00.

607. Contracts and Specifications. A study of the general principles and laws of contracts as applied to engineering, including the preparation and study of specifications and contracts based upon engineering structures designed by the individual student.

Senior year; second semester; 2 credits; 2 recitations.

GRADUATE COURSE IN HIGHWAY ENGINEERING

From Wednesday, January 2, 1918, to end of first semester.

This short course in Highway Engineering is given by the department of Highway Engineering in cooperation with the departments of Civil, Experimental, and Irrigation Engineering and is intended for graduate engineers who wish to specialize in some line of highway work, or for others properly prepared. The purpose of the course is to review the principles and current practice of Highway Engineering.

The various courses are complete in themselves and any one course may be taken without the others if the applicant's preparation is suitable for that course.

Instruction will be given by means of lectures, assigned reading, and laboratory practice. Special lectures by non-resident engineers will be provided where possible. No classes will be formed unless a sufficient number of students apply. During the year 1918 classes will not be arranged for more than 16 credit hours a week.

Those intending to take the course should write Professor Skelton in advance.

The following courses are offered:

Road Design. Two times a week.

Construction of Roads. Three times a week.

Highway Bridges. Three times a week.

Cement and Highway Laboratory. Three laboratory periods a week.

Street Design and Construction. Three times a week.

Reinforced Concrete Highway Structures. Three times a week.

Contracts and Specifications. Two times a week.

The Hydraulics of Highway Drainage and Construction. One laboratory period a week.

IRRIGATION ENGINEERING

THOMAS ANDERSON HENDRICKS TEETER, Professor

Successful agriculture in the arid parts of Oregon is based on the science of irrigation. The widespread development of irrigation lands in this and other states of the arid west, by means of both gravity supplies and pumping systems, has extended the necessary qualifications of the engineer to include a knowledge of irrigation methods, pumping, and power machinery. The province of the engineer, therefore, comprises the development, conservation, and economical use of limited water supplies. The failure of our irrigation projects is too frequently caused by the employment of incompetent engineers and managers. In recognition of the need, in the Pacific Northwest, for engineers trained in hydraulics, irrigation, and water power, the course in Irrigation Engineering has been established.

Realizing, however, that the young engineer is frequently obliged to take charge of work which properly falls outside of the field in which he has specialized, the course in Hydraulics and Irrigation Engineering is arranged to cover as broad a field as prac-

licable, in order that the graduate may experience little difficulty in accommodating himself to the available positions. The curriculum in the freshman and sophomore years is the same as in the general civil engineering courses. It has for its purpose the laying of a foundation on which to build the more specialized technical work of the junior and senior years. The last two years are intended to equip the student with a well-rounded knowledge of hydraulics and irrigation engineering — a knowledge which will enable the student to hold a responsible position in reclamation and power work.

The work of this department is designed to furnish a thorough course of theoretical instruction accompanied by practice in the various lines of irrigation, drainage, water-supply, and water-power engineering. The course, moreover, is made practical by a large proportion of laboratory and field practice in conjunction with the theoretical work. Special stress is laid on the solution of problems, and experiments in the laboratory. Emphasis is laid on skill in handling surveying and water-measuring instruments. The student is taught how to make stream measurements; design, lay out, and construct dams, canals, headworks, diversion weirs, flumes, pipe lines, and distributing systems.

Inspection trips are conducted in the junior and senior years to afford the students an opportunity to familiarize themselves with actual engineering work.

Electives. Ample opportunity is given the student to elect courses outside of the School of Engineering. This provision is made that the student may be encouraged to study Business Management, Economics, Political Science, Accounting, English, and Modern Languages, a knowledge of each of which is helpful, if not essential, in the engineering profession. In addition, the School of Agriculture offers to the student of irrigation engineering, special courses in irrigation farming, forage crops, climatology, farm drainage, and soil physics together with their relations to the growth of crops on irrigated lands.

Equipment. The excellent equipment of the Civil and Experimental departments, as described under these respective titles, is available for use by the students in Irrigation Engineering. Besides the draughting rooms and laboratories, the student has the use of transits, levels, plane-tables, current meters, and tapes, for practical work, as well as pumps, water meters, rams, and small water wheels of the Experimental Engineering laboratories for

experimental work. Facilities for experiments with small weirs, orifices, and devices for measuring irrigation water are provided.

In addition to the above facilities, the proximity of the Willamette and Mary's rivers, Oak Creek, and the mill race of the Corvallis Flouring Mills, affords excellent opportunities for practice in stream gauging. For those students who desire to prepare themselves for positions as managers of irrigation projects, the courses in Drainage and Irrigation give access to the equipment of that department.

COURSE IN IRRIGATION ENGINEERING

The prescribed courses of the freshman and sophomore years of the courses in Irrigation, Civil, and Highway Engineering are identical.

	Semester	
	1st	2nd
Senior Year		
Engineering Seminar (C. E. 605, 606).....	1	1
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (C. E. 607).....		2
Roofs and Bridges (C. E. 513).....	4	
Drainage Engineering (I. E. 502).....		3
Hydrology (I. E. 303).....	1	
Soil Surveying (Soils 13).....		3
Irrigation Engineering (I. E. 401).....	2	
Design of Irrigation Structures (I. E. 402).....		2
Hydraulics Laboratory (Exp. E. 262).....		2
Hydraulic Pumps and Motors (I. E. 201).....	2	
Electives (Approved)	3	3
	<hr/> 16	<hr/> 16

The following courses are offered:

101. Hydraulics. A practical application of the principles of hydraulics to irrigation farming, arranged especially for agricultural students. A study of the laws of water pressure in tanks, pipes, and flumes; the measurement of water by weirs, orifices, and current meters; the study of losses of head in pipes and the consequent effect on the discharge. The design of open channels; seepage losses; the operation of rams, pumps, and other lifting devices.

Elective for seniors in Agriculture; senior year; first semester; 2 credits; 2 lectures. This course can be taken only in conjunction

with Experimental Engineering 265, a 1-credit laboratory course, covering the same field. Text: Merriman, Elements of Hydraulics.

102. Hydraulics. A technical course dealing with the elementary laws of liquids in motion and at rest; the weight and pressure of water on dams and gates, velocity and discharge through orifices, tubes, pipes, and flumes; stream-lines, fluid friction, losses of head; time of emptying reservoirs; and waterhammer.

Prerequisite: M. E. 251. Required of juniors in Civil, Highway, Irrigation, Electrical, and Mining Engineering; junior year; second semester; 3 credits; 3 lecture periods. Text: Daugherty, Elements of Hydraulics.

201. Hydraulic Pumps and Motors. The application of the principles of hydraulics to the design, construction, and operation of pumps and water wheels; the various forms of wheels and pumps, their adaptability, and efficiency.

Prerequisite: Hydraulics, I. E. 102. Required of seniors in Irrigation Engineering; elective for all other seniors in Engineering; senior year; first semester; 2 credits; 2 lecture periods. Texts: Daugherty, Hydraulic Turbines. Daugherty, Centrifugal Pumps.

204. Water Power. A general study of the development of water power on streams; the effect of pondage, storage, and load factor on the capacity and efficiency of the plant and equipment; a detailed study of the characteristics of modern water turbines, together with an investigation of the speed regulation and manner of governing large plants. Practical problems in the design of plants will constitute a part of this course.

Prerequisite: Water Supply Engineering, I. E. 305 or Irrigation Engineering, I. E. 401. Elective for seniors or graduates in Engineering courses; senior year; second semester; 3 credits; 3 lecture periods. Fee \$1.00. Text: Meade, Water Power Engineering.

303. Hydrology. A recitation and problem course dealing with the character of drainage basins; relations between rainfall and runoff; estimating flow from watersheds; variations in seasonal discharges, a study of current meters, and other instruments and methods for determining stream flow; the hydrograph and its use; the duration curve; the ripple curves and their relations to power and storage studies.

Prerequisite: I. E. 101 or 103. Required of seniors in Irrigation Engineering; elective for other Engineering students and

Agricultural students; senior year; first semester; 1 credit; 1 recitation. Text: Hoyt and Grover, River Discharge. Fee \$1.00.

305. Municipal Water Supply. Preliminary investigations for determining the available supply of water for irrigation and domestic purposes; the use of the mass diagram in the study of storage; ground water resources; the source of water supplies; manner of conveying and storing water; requirements for fire protection; the economics of pumping and the proper installation of pumping plants. The solution of numerical problems is required of the student.

Prerequisites C. E. 511, I. E. 102. Elective for seniors in Engineering; senior year; first semester; 3 credits; 2 lecture periods; 1 laboratory period. Fee \$1.00. Text: Turneaure and Russell, Water Supply Engineering.

401. Irrigation Engineering. Investigations and surveys; the operation and maintenance of large irrigation projects from the engineer's point of view; precipitation, run-off, underground flow, fluctuation of stream flow; storage; methods of determining losses due to evaporation and seepage; canal linings; the phenomena of water logging and alkali deposits; drainage; the duty of water; irrigation by pumps; the location and construction of irrigation systems; diversion weirs, headgates, flumes and drops; the theory and practice of water measurements, water records, methods practiced in other countries.

Prerequisite: I. E. 102. Required of seniors in Irrigation Engineering; senior year; first semester; 2 credits; 2 lecture periods. Text: Etcheverry, Conveyance of Water, Vol. II.

402. Irrigation Construction. This course deals with the storage and conveyance of water; the design of headworks and flumes; the selection of dam sites; investigations of the stability of dams in use; the design of a dam by Wegman's method; the design of pipe lines, earthen dams, and reservoirs; the design of flash boards and movable dams, hollow dams, and their application to storage and pondage. This course consists entirely of numerical problems with occasional lectures on the solution of the same.

Prerequisites: C. E. 511, I. E. 401, and I. E. 102. Required of seniors in Irrigation Engineering; senior year; second semester; 2 credits; 2 three-hour laboratory periods. Fee \$1.00. Text: Etcheverry, Irrigation Structures, Vol. III.

502. Drainage Engineering. Surveys for, and design of, large drainage systems; the study of run-off and drainage coefficients;

open ditch construction, dredging, and cleaning of large drainage channels; methods of computing sizes of tile drains; plans, reports, and records; estimates of costs; preparation and enforcement of specifications; division of costs; inspection of drain tile.

Prerequisite: I. E. 102. Required of seniors in Irrigation Engineering; senior year; second semester; 3 credits; 2 lectures and 1 laboratory period. Fee \$1.00. Text: Parsons, Drainage Engineering.

602. Water Law. A study of riparian rights; the early development of the water laws of the arid regions; doctrine of appropriation; beneficial use; comparison of California and Colorado doctrines; rights of appropriations; law of storage and diversion; rights of way; relation of water law and land law; relation of water to land appurtenant; prescription; abandonment; federal water laws; state control; water laws of Oregon; adjudication; irrigation and drainage district law; duties of state engineer; a brief comparison of Canadian and foreign water laws.

Elective for seniors in Irrigation Engineering. Text: Davis, The Law of Irrigation.

702. Sanitary Engineering. Drainage systems of populous districts, including chemical and bacterial purification of sewerage; collection and disposal of garbage; street cleaning; separate and combined water carriage systems; surveys, plans, and specifications; law of flow and determination of size and capacity; brick, terracotta, cement, and concrete sewers.

Elective for seniors in Civil Engineering. Prerequisite: I. E. 102. Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Text: Merriman, Elements of Sanitary Engineering.

802. Hydrography and Navigation. This consists of a brief study of the figure of the earth and the celestial sphere, followed by methods of determining latitude, longitude, time, and azimuth from the sun and stars; the location of soundings, maritime charting and mapping; and the fundamentals of navigation. Numerical problems are assigned to supplement the field work.

Prerequisites: C. E. 222, 223, and Spherical Trigonometry. **Elective for juniors and seniors; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00.**

ELECTRICAL ENGINEERING

RICHARD HAROLD DEARBORN, Professor
LAWRENCE FISHER WOOSTER, Assistant Professor
WILLIS DHU AINE PEASLEE, Instructor
JOHN HOOPER, Assistant

Since the advent of steam as a motive power, it is probable that no agency has so deeply affected the course of history and the intimate life of a large proportion of the human race as has the electric current, whether used in the transmission of intelligence, to furnish light, or to provide power for transportation and the industries.

Already the electrical industries are counted among the greatest in the world; their employees number more than a hundred thousand in the United States alone; their business in this country doubles every five years; and their field is ever expanding.

Notwithstanding this fact, most of the business is controlled by comparatively few corporations. The competition for desirable positions is therefore keen; and since the field in Electrical Engineering for the independent engineer is limited, only men of exceptional ability and energy attain the higher and more desirable positions.

Accordingly, no man is advised to take Electrical Engineering who does not consider himself, by taste and ability, exceptionally fitted therefor.

The College course is designed especially to train the young engineer in the theory of his profession, such practical work as is given in shop and laboratory being subordinated to this end. Practical acquaintance with actual conditions can be acquired only in the field, during vacation and after graduation. For this reason, and in order to supplement his college education, the student is urged to spend at least a part of his vacation in some line of electrical industry.

Starting with the foundation subjects of mathematics, science, drawing, and shopwork, the student proceeds through the study of form expression in descriptive geometry, mechanism, the laws of mechanics, strength of materials, stress in structures and machinery; through the study of electricity and its application to machinery; the characteristic performance of electrical apparatus, its design and operation; through the study of thermodynamics as applied to various types of heat engines, and finally to the composite power system involving the steam or hydro-electric power

plant and the system for transmitting and distributing electrical energy.

Equipment. The laboratory of this department occupies a large part of the west half of the first floor of Mechanical Hall, and is divided into several rooms, one for high-voltage testing, one for instruments, and another for supplies. Besides the equipment therein, including generators, motors, and other apparatus, the machinery in the College power plant and sub-station, is available for study and testing purposes. Three-phase electrical energy is supplied by the long-distance transmission line or by the local generating unit as desired.

In the laboratory is a $6\frac{1}{2} \times 15$ foot switchboard, consisting of three asbestos wood panels on which are mounted a number of voltmeters and ammeters for direct and alternating current; a power factor meter; a frequency meter, and synchroscope; a set of synchronizing lamps; circuit breakers; switches; and a large number of plug terminals, the leads of which extend to the four machine platforms; two slate panels with instruments and switches for direct-current machines; and two arc light regulating panels. Immediately adjacent thereto is a controller, auto-transformer and rheostat rack, six feet high by sixteen feet in length.

The machine platforms just mentioned are four feet wide by fourteen feet long, and have upon them the following equipment: one five, one seven-and-a-half, one ten, and one fifteen horsepower, three-phase, induction motor; two five, two seven-and-one-half, two ten, and two twelve-and-one-half kilowatt, 125-volt direct-current generators; two seven-and-one-half kilowatt rotary converters for parallel operation and one two-kilowatt rotary converter; two two-and-one-half kilowatt induction motor generator sets; one two-and-one-half kilowatt synchronous motor generator set; three seven and one-half kilowatt revolving field alternators with three additional rotors for parallel operation, and one seven-and-one-half kilowatt revolving field alternator, from all of which current of one-, two-, three-, four-, and six-phases may be taken; two five-arc light constant current, one ten-volt 1000-ampere welding, one five-kilowatt 15,000 volt wireless, three seven-and-one-half kilowatt, 2200-220-110-volt transformers with ten taps each in the secondary, giving nine different voltages from 24 to 220 volts, with 87 percent taps in both primary and secondary for transformation from three- to two-phase or the reverse, three 110 to 440 volt, and a number of ordinary transformers and compensators.

In addition to these the department is particularly well equipped to handle high-voltage testing with one ten-kilowatt 110,000-volt transformer, and one 100-kilowatt 350,000-volt Thor-darsen transformer.

The instruments available comprise standard portable volt, ampere, and watt meters which are divided into two groups, one of which is used for routine laboratory work, the other reserved for thesis and other tests in which greater accuracy is desired. In addition to this equipment, the departments of Physics and Electrical Engineering maintain an instrument standardization laboratory equipped with two one-hundred ampere storage cells and a group of dry cells to furnish potentials up to one hundred and fifty volts. The precision instruments and apparatus consist of a Leeds and Northrup potentiometer with certified standard cells and a complete line of standard shunts from one one-thousandth to ten ohms, a Weston laboratory standard voltmeter with ranges of 1, 100, and 200 volts and Siemens and Halske laboratory standard ammeters with ranges from 2.5 to 50 amperes and a similar watt-meter with five and ten ampere range.

DEGREE COURSE IN ELECTRICAL ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Elementary Analysis (Math. 31).....		5
General Physics (Phys. 1, 2).....	3	3
Mechanical Drawing (M. E. 151).....	2	
Descriptive Drawing (M. E. 152).....		3
Foundry (Ind. Arts 171).....	2	
Patternmaking (Ind. Arts 131).....		2
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Modern English Prose (Eng. 81, 82) or Adv. German or Adv. French (Mod. Lang. 207, 208, or 107, 108)*....	3	3
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

* By special permission a student may elect beginning German or French, (Modern Language 201, 202, or 101, 102).

	Semester	
	1st	2nd
Sophomore Year		
Differential and Integral Calculus (Math. 51, 52).....	4	4
Electrical Physics (Physics 105).....	3	
Electrical Measurements (Phys 106).....		3
General Chemistry (Chem. 100, 101).....	3	3
Introduction to Electrical Engineering (E. E. 121, 122)....	1	1
Mechanical Drawing (M. E. 153).....	3	
Mechanism (M. E. 204).....		3
Blacksmithing (Ind. Arts 151).....	2	
Machine Shop (Ind. Arts 206).....		2
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Junior Year

Electrical Engineering (E. E. 101, 102).....	4	4
Electrical Engineering Laboratory (E. E. 201, 202).....	3	3
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Heat Engines and Boilers (M. E. 318).....	3	
Hydraulics (I. E. 102).....		3
Plane Surveying (C. E. 254).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/> 17	<hr/> 17

Senior Year

Electrical Engineering (E. E. 103, 104).....	4	3
Electrical Design (E. E. 105).....		1
Electrical Laboratory (E. E. 203).....	4	
Electric Railways (E. E. 309).....	2	
Illuminating Engineering (E. E. 316).....		2
Telephony and Telegraphy (E. E. 313).....		2
Applied Mechanics Laboratory (Exp. E. 205).....	3	
Power and Hydraulic Laboratory (Exp. E. 206).....		3
Optional	3	6
	<hr/> 16	<hr/> 16

Suggested Options	Semester	
	1st	2nd
Power Plant Design (M. E. 316).....	3	
Concrete Laboratory (Exp. E. 241).....	2	
Public Service Regulation (E. E. 317).....	2	
Periodical Literature (E. E. 301).....	1	
Practical Public Speaking (English 105).....	3	
Technical English (English 141).....	2	
Central Stations (E. E. 318).....		2
Electrical Laboratory (E. E. 204).....		3
Electric Railways (E. E. 310).....		3
High Voltage Engineering (E. E. 308).....		2
Thesis (E. E. 306).....		2
Seminar (E. E. 302).....		1

The following courses are offered:

101. Electrical Engineering. Study of the sine wave and periodic alternating quantity; harmonic analysis; laws governing the flow of current and energy; the magnetic and electrostatic circuit, production of rotating field by means of polyphase alternating currents in a distributed winding; losses in electric circuits; elementary theory of transmission lines.

Course 101 must be taken concurrently with 201, and 102 concurrently with 202. Electrical Engineering; junior year; first semester; 4 credits; 4 recitations. Text: Wilson, Electrical Engineering.

102. Electrical Engineering. Continuation of course 101.

Electrical Engineering; junior year; second semester; 4 credits; 4 recitations. Text: Wilson, Electrical Engineering.

103. Electrical Engineering. A study of the equipment of power plants, transmission lines, and distributing systems, and of the technical and economic problems connected with the generation, transmission, and distribution of electrical energy.

In connection with this course, inspection trips are made to the properties of various power companies. The expense of these trips will approximate twenty dollars, and should be anticipated by every Electrical Engineering student in his senior year.

Prerequisites: E. E. 101, 102, 201, 202. Electrical Engineering; senior year; first semester; 4 credits; 4 lectures.

104. Electrical Engineering. A continuation of course 103.

Electrical Engineering; senior year; second semester; 3 credits; 3 lectures.

105. Electrical Design. The design of transmission lines and distribution systems, both overhead and underground, with particular attention to costs.

Electrical Engineering; senior year; second semester; 1 credit; 1 lecture.

121. Introduction to Electrical Engineering. A general survey of the field of electrical engineering and the applications of electricity.

Electrical Engineering; sophomore year; first semester; 1 credit; 1 recitation. Text: Norris, An introduction to the Study of Electrical Engineering.

122. Introduction to Electrical Engineering. A continuation of course 121.

Electrical Engineering; sophomore year; second semester; 1 credit; 1 recitation. Text: Norris, An introduction to the Study of Electrical Engineering.

201. Electrical Engineering Laboratory. Study of electrical instruments; wave form and polarity of alternating currents; current, electromotive force and power relations in circuits involving resistance, inductance, and capacity; principles of operation of direct current dynamos and motors.

Must be taken concurrently with course 101.

Electrical Engineering; junior year; first semester; 3 credits; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Karapetoff, Experimental Electrical Engineering.

202. Electrical Engineering Laboratory. Continuation of course 201. Study of hysteresis and eddy current losses in magnetic circuits, electromotive force and energy losses in electrical circuits; the separation of losses in direct current machinery; efficiency and loading tests of direct and alternating current machinery; properties of insulating materials.

Must be taken concurrently with course 102.

Electrical Engineering; junior year; second semester; 3 credits; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Karapetoff, Experimental Electrical Engineering.

203. Electrical Engineering Laboratory. Characteristic performance of alternating current machinery, including alternator, synchronous and induction motor, synchronous converter and static transformer with parallel operation and pump back tests.

Prerequisites: E. E. 101, 102, 201, 202. Electrical Engineering; senior year; first semester; 4 credits; 1 lecture; 1 laboratory period.

Fee \$2.50. Deposit \$3.00. Text: Karapetoff, Experimental Electrical Engineering.

204. Electrical Engineering Laboratory. Complete engineering and commercial tests on standard electrical machinery, including standard acceptance tests on machines and plants, and special tests for engineering information. Tests will be run on outside plants under commercial operating conditions.

Prerequisite: E. E. 203. Electrical Engineering; senior year; second semester; 3 credits; 1 laboratory period. Fee \$2.50. Deposit \$3.00.

301. Study of Current Periodical Literature. Presentation of abstracts and discussion of current articles in electrical periodicals.

Electrical Engineering; senior year; first semester; 1 credit; 1 recitation. Text: Current Periodicals.

302. Seminar. A continuation of course 301 with a more complete analysis and discussion of recent developments.

Electrical Engineering; senior year; second semester; 1 credit; 1 recitation. Text: Current Periodicals.

306. Thesis. Elective, by permission, to seniors in Electrical Engineering. Only those whose past record indicates ability successfully to complete a satisfactory thesis, will be permitted to make this election.

Electrical Engineering; senior year; second semester; 2 credits.

308. High Voltage Engineering. A study and experimental investigation of high voltage and high frequency phenomena.

Electrical Engineering; senior year; second semester; 2 credits; 2 recitations. Text: Peek, Dielectric Phenomena in High Voltage Engineering.

309. Electric Railways. A general study of the application of electricity to street and interurban railways, covering traffic conditions, speed time curves, and rolling stock.

Electrical Engineering; senior year; first semester; 2 credits; 2 recitations. Text: Harding, Electric Railway Engineering.

310. Electric Railways. Continuation of courses 309. A study of conditions governing the electrification of trunk lines; systems of electrification and transportation economics.

Prerequisite: E. E. 309. Electrical Engineering; senior year; second semester; 3 credits; 3 recitations. Text: Electric Traction for Railway Trains.

313. Telephony and Telegraphy. A general study of the application of electricity to the transmission of intelligence. Manual

and automatic telephony, duplex and quadruplex telegraphy, submarine and wireless telegraphy.

Prerequisite: E. E. 102. Electrical Engineering; senior year; second semester; 2 credits; 2 recitations.

316. Illuminating Engineering. A study of artificial light sources and the application of these sources to illumination, both exterior and interior.

Electrical Engineering; senior year; second semester; 2 credits; 2 recitations. Text: Wickenden, Illumination and Photometry.

317. Public Service Regulation. A study of regulation by commissions, service rules, appraisals, depreciation, and rate making.

Electrical Engineering; senior year; first semester; 2 credits; 2 recitations. Text: Hayes, Public Utilities.

318. Central Stations. A study of the problems arising in the operation of electric systems. Organization, operating problems, public policy, cost accounting, rate study, etc.

Electrical Engineering; senior year; second semester; 2 credits; 2 recitations.

403. Study of Electric Machinery. Class room and laboratory study of electrical instruments, current, electromotive force and power relations; the operation, care, and management of familiar types of generators and motors, both alternating and direct current, and transformers.

Prerequisites: Elementary Chemistry, Physics, Calculus, Mechanics. Mechanical, Mining, and Logging Engineering; junior or senior year; either semester; 3 credits; 1 recitation; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Gray, Principles and Practice of Electrical Engineering.

406. Electric Lumbering Machinery. A special study of the application of electricity to the lumbering and logging industry.

Prerequisite: E. E. 403. Logging Engineering; senior year; second semester; 2 credits; 2 recitations.

408. Electric Mining Machinery. A study of the use of electricity in mines and mining operations.

Prerequisite: E. E. 403. Mining Engineering; senior year; second semester; 2 credits; 2 recitations.

410. Electric Machine Drive. The characteristics of electric motors and their applications to machine shop tools and allied industries.

Prerequisite: E. E. 403. Mechanical Engineering; senior year; second semester; 2 credits; 2 recitations.

EXPERIMENTAL ENGINEERING

SAMUEL HERMAN GRAF, Professor
BURTON SYLVESTER ORR, Assistant Professor
*RAY BOALS, Instructor
GEORGE EMIL HECK, Instructor

The courses in engineering laboratory practice are designed to familiarize the student with processes of investigation; to afford experience in conducting and reporting experimental engineering work; to secure data which shall verify and supplement theoretical instruction; and, to some extent at least, to give a practical knowledge of construction and management of machinery and apparatus.

Appropriate divisions of this work are regularly taken by students in all branches of Engineering, Forestry, and Industrial Arts, and may be elected by students in other courses. Special courses are offered, as listed in what follows, to meet the needs of the students in the different lines of work. An earnest effort is made, not so much to impart a mass of detail, as to develop in the student his powers of observation and his capacity for independent thought.

Reports are required of all experiments, and are regarded as a most important part of the work. They are carefully read and criticised as to form, neatness, conciseness, accuracy of expression and spelling, as well as accuracy of technical data and calculations. With this training, when the student completes the work, he should know how to prepare an acceptable engineering report, or how to arrange data for publication.

Equipment. Appropriate portions of the equipment for this work are utilized by all departments in Engineering and Forestry. The equipment comprises the following divisions: a materials-testing laboratory, a cement-testing laboratory, a steam laboratory, and a gas-engine and hydraulic laboratory. These divisions have in common the equipment for the preliminary work, such as calculating devices, planimeters, Amsler integrator, micrometers, and other general apparatus.

The materials-testing laboratory occupies the northwest corner of the first floor of Mechanical Hall and contains the following: a 150,000-pound Riehle universal testing machine fitted with extension table for beams up to 16 feet in length; a 50,000-pound Riehle automatic and autographic testing machine; a 60,000-pound-inch Olsen torsion-testing machine; a 400-foot-pound drop-testing ma-

* On leave of absence.

chine and a static load-testing machine, both of which were built in the College shops; a Case tempering furnace with pyrometer; Scleroscope and Brinell ball hardness testers; Tassin metallo-graphic outfit; and auxiliary apparatus including a deformeter, torsion indicator, compression micrometers, several extensometers, deflectometers, and other minor pieces.

A part of the materials laboratory also is devoted to the testing of materials for highway construction. This equipment includes the following: Olsen impact machine for toughness tests; Riehle machine for hardness tests; ball mill, molding machine, and impact machine for cementing value tests on rock dust; rattler for abrasion tests on macadam or paving-rock, another for paving-brick; core drills and saw for cutting stone specimens; shakers and sieves for mechanical analysis of sand and aggregates, including a set of Tyler standard screen scale sieves; penetrometer, viscosimeter, float test, Osborne adhesive machine, centrifuges, and other appliances for making physical tests of bituminous cements and road oils.

The cement testing laboratory, also located in Mechanical Hall, is equipped with convenient iron-topped tables for mixing, intended to accommodate six students each. Apparatus is provided sufficient for making all the standard A. S. C. E. tests, as well as for some additional experiments. There are a large number of briquette, cube, and special cylinder molds, three Vicat needles, Gillmore needles, screens, including a standard set, damp closet, aging tanks, boiling test apparatus, autoclave, briquette molding machine, a 1000-pound Fairbanks cement-testing machine, permeability apparatus for testing various mixtures or water-proofing compounds, and small apparatus including balances, specific gravity flasks, trowels, sampling irons, etc.

The steam laboratory, located in the New Heating Plant, contains the following machines: a 7x8 throttling engine used principally for experiments on valve setting, a 9x10 Ideal automatic high-speed engine driving a 30 KVA, 3-phase generator, a 15 BHP, two-stage Kerr turbine, an 8x18 simple Murray Corliss engine, and a 6¼ and 10½x6¼ Sturtevant vertical compound engine. The last three of these are so arranged that they may be run either condensing or with atmospheric exhaust. The condenser and vacuum pump are so equipped that the cooling water may be measured by means of a Venturi meter and the condensed steam by a Kennicott water-weigher. The engines are all fitted with

gauges, sampling pipes, indicator connections, and brakes of various types.

For tests on boilers and their auxiliaries there are available the equipments of both the new and the old heating plants. The former consists of three Flanner water-tube boilers aggregating 700 horse-power; these are oil fired and fitted with modern auxiliary equipment, including feed water and oil meters, thermometer wells, flue gas sampler, etc. In the old plant there are three fire-tube boilers of about 170 horse-power total capacity, for which cord wood, and waste from the College wood shop are used for fuel.

Of smaller power laboratory equipment there may be mentioned a General Electric steam meter, pressure gauge tester, Schaeffer and Budenberg indicator calibrating device, seven indicators including a Trill instrument for continuous diagrams, several reducing wheels, two steam calorimeters, Parr and Emerson fuel calorimeters, flue gas analysis apparatus, two pyrometers, draught gauges, recording and indicating pressure gauges, etc.

For work on power transmission, a transmission dynamometer and a special belt-testing machine are provided. Tests may also be made on lubricants, bearing metals, and different types of bearings, by means of a Golden bearing and oil dynamometer, or a pendulum type oil testing machine. There are also at hand the usual minor pieces, as flash point apparatus, viscosimeters, etc.

The gas engine and hydraulic laboratory is located in the old Power Plant building. The gas engine equipment consists of three four-cycle and three two-cycle gasoline and oil engines, and an 8-inch Reeco-Ericson hot-air engine. All of these are especially fitted for testing and demonstration, the largest, a 20-H. P. Bessemer oil engine, being direct connected to a high pressure pump. In the same room are also installed a Gardner air compressor and two centrifugal blowers for work on air compression and transmission. The hydraulic section contains the following: a centrifugal pump driven by a rated variable speed motor, several steam pumps, a 4x6 Gouls triplex pump, 12-inch Doble laboratory water motor, two hydraulic rams, 2-inch Venturi meter, current meter, two ordinary service meters, calibrating tanks, orifice boxes with suitable plates and orifices, weirs, hook gauge, and other small apparatus. In addition to work in the laboratory, measurements and tests of neighboring streams and installations may be made.

The following courses are offered:

201. Applied Mechanics Laboratory. A study of experimental investigation, reduction of data, mechanical calculating devices, and the preparation of neat, concise, and accurate reports. The calibration of various measuring instruments such as gauges, pyrometers, transmission dynamometers, etc., is then taken up. After this follow exercises in the measurement of power, including a test of the transmitting capacity and slip of belting. Transverse, tensile, compressive, torsion, and other standard tests of the common materials of construction are made; the heating value of a sample of coal is determined; the course being then concluded by two exercises on the properties of an assigned lubricating oil.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. Statics and Dynamics, (M. E. 251), and Theory and Practice of Steam Engineering, (M. E. 305), should also be taken in conjunction with this course. Course in Mechanical Engineering; junior year; first semester; 3 credits apportioned as follows: preparation, $\frac{1}{2}$ credit; laboratory, 1 credit; report, $1\frac{1}{2}$ credits. Fee \$3.00. Text: Carpenter and Diederichs, *Experimental Engineering*.

202. Power and Hydraulic Laboratory. A continuation of course 201, beginning with the use and calibration of the indicator and planimeter. Tests are then made on steam and gas engines, a boiler, an impulse water wheel, pumps, an air compressor, and other power equipment. Exercises are given in the setting of Corliss and slide valves, and the course is concluded with an economy test of a steam turbine operating condensing.

This work is covered in fifteen laboratory exercises, one each week, and a careful report of each experiment is required.

Prerequisite: Exp. E. 201. Advanced Steam Engineering, (M. E. 306), must be taken in conjunction with this course. Course in Mechanical Engineering; junior year; second semester; 3 credits; apportioned as for course 201. Fee \$3.00. Text: Carpenter and Diederichs, *Experimental Engineering*.

203. Advanced Mechanics Laboratory. A rather general course in experimental mechanics dealing with more advanced studies of materials, fuels, lubricants, bearing metals, belting, etc., with special reference to the application of the results to the requirements of the mechanical engineer in actual practice. Reports required.

Prerequisites: Exp. E. 201 and 202. Course in Mechanical Engineering; senior year; first semester; 3 credits, apportioned as

for courses 201 and 202. Fee \$3.00. Texts: Carpenter and Diederichs, Experimental Engineering. G. B. Upton, Materials of Construction.

204. Advanced Power Laboratory. A course similar in nature to the preceding, but dealing with power and hydraulic machinery. Various tests and studies are made on the following: a triplex pump, an air compressor, a centrifugal blower, a steam turbine, a compound engine, and finally, a complete test of a simple condensing Corliss engine, including the heat balance and an application of Clayton's analysis. Complete reports required.

Prerequisite: Exp. E. 203. Course in Mechanical Engineering; senior year; second semester; 3 credits, apportioned as for the preceding. Fee \$3.00. Text: Carpenter and Diederichs, Experimental Engineering.

205. Applied Mechanics Laboratory. Fifteen experiments consisting of exercises selected chiefly from courses 201 and 203. A course designed especially for the seniors in Electrical Engineering.

Prerequisites: Phys. 101 and 102, Math. 51 and 52, and all of the Mechanical Engineering courses required of Electrical Engineering juniors. Advanced Steam Engineering (M. E. 306), should be taken in conjunction. Course in Electrical Engineering; senior year; first semester; 3 credits, distributed as for course 201. Fee: \$3.00. Text: Moyer, Power Plant Testing.

206. Power and Hydraulic Laboratory. Similar in grade and purpose to the preceding. Consists of exercises selected from courses 202 and 204.

Prerequisite: Course 205. Course in Electrical Engineering; senior year; second semester; 3 credits, apportioned as in the preceding. Fee \$3.00. Text: Moyer, Power Plant Testing.

207. Applied Mechanics Laboratory. This course is similar, in range of equipment studied, to course 201, but since it is intended for students in the Industrial Arts course who do not have some of the theoretical work in power engineering, the work is taken up in a more general manner, stress being laid on those principles and details which are of special value to the teacher of manual training. Some time is also taken to explain the theory involved, and the students are taught to prepare neat and accurate reports of their work.

Prerequisites: Math. 11, and Phys. 1 and 2. Course in Industrial Arts; senior year; first semester; 3 credits, apportioned

as follows: laboratory, 1 credit; report and preparation, 2 credits. Fee \$3.00. Text: Moyer, Power Plant Testing.

208. Power and Hydraulic Laboratory. A course similar in grade to the preceding, designed for seniors in the Industrial Arts course. The work consists of fifteen laboratory exercises along the lines of those for course 202, and the usual reports are required.

Prerequisite: Exp. E. 207. Required in Industrial Arts; senior year; second semester; 3 credits, apportioned as for course 207. Fee \$3.00. Text: Moyer, Power Plant Testing.

210. General Engineering Laboratory. A course designed for seniors in Mining Engineering and Ceramics, or for others who desire a brief, comprehensive course in mechanical laboratory practice. The work consists of ten exercises selected from courses 201 and 202, and embraces tests on materials, hydraulic machinery, and steam and gas engines. Reports are required as in the preceding.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. Courses in Mining Engineering and Ceramics; senior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 1 credit. Fee \$2.00. Text: Moyer, Power Plant Testing.

225. General Materials Testing Laboratory. An elective course designed especially for students in Chemical Engineering, and for others desiring a general course dealing with a wide range of materials, methods, and equipment. The purpose is to cover those tests on materials which the industrial chemist in a commercial or city testing laboratory is required to make. Methods standardized by the American Society for Testing Materials and other recognized organizations, are used throughout. The work consists of fifteen exercises including tests on cement, bituminous and non-bituminous road materials, structural materials, lubricating oils, and fuels.

Prerequisite: M. E. 252. Course in Chemical Engineering; senior year; first semester; or elective to suitably prepared students in other courses; 3 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 2 credits. Fee \$3.00. Text: Assigned references.

231. Cement and Highway Laboratory. An experimental study of Portland cement; standard A. S. T. M. and other methods of cement testing; examination of sands, grading of aggregates, determination of voids, etc., abrasion, hardness, toughness, cement-

ing value, and other tests on macadam rock; tests of paving brick; standard tests on bituminous compounds and paving aggregates.

This course is of broad scope, but is still sufficiently detailed to give the student a good working basis for the intelligent interpretation and preparation of specifications for the materials treated.

Prerequisites: Phys. 101 and 102 and Math. 51 and 52. Roads and Pavements, (C. E. 405), should be taken in conjunction with this course. Courses in Civil, Highway, and Irrigation Engineering; junior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 1 credit. Fee \$3.00. Text: Hatt and Scofield, Laboratory Manual for Testing Materials. U. S. Office of Public Roads' Bulletins, No. 314 and 347. Hubbard, Laboratory Manual of Bituminous Materials.

232. Structural Materials Laboratory. Standard tests of timber, iron, steel, brick, stone, etc., with special reference to the methods and specifications adopted by the American Society for Testing Materials, and other national engineering organizations. Following the general tests, some time is devoted to work on plain and reinforced concrete.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. This course should be preceded by course 231, and Strength of Materials (M. E. 252), should be taken in conjunction with it. Courses in Civil, Highway, and Irrigation Engineering; junior year; second semester; 3 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 2 credits. Fee \$3.00. Text: Hatt and Scofield. Laboratory Manual for Testing Materials. Mills, Materials of Construction.

233. Advanced Highway Laboratory. Following course 231, and designed particularly for those specializing in Highway Engineering. Different road and paving materials and binders are tested and their relative values determined. Sheet asphalt mixtures and bituminous mortars are studied, to determine the effects of various changes in the grading of the aggregates. Finally, samples of various types of roads and pavements are analyzed for density, composition, and grading, with special reference to their conformity with specifications under which built.

Prerequisites: Exp. E. 231, and C. E. 405. Course in Highway Engineering; senior year; first semester; 2 credits, apportioned 1 to laboratory work and 1 to report. Fee \$3.00. Text: Hubbard, Laboratory Manual of Bituminous Materials. Assigned reference.

235. Advanced Materials Laboratory. An advanced course offered as an elective to students who have completed course 232, and who desire additional laboratory work on materials. In the past, tests have been made on reinforcing steel, reinforced beams, hooped columns, water-proofing of concrete, thermal conductivity of concrete, study of stresses by strain gauge, etc., but the course is varied according to the special interests and desires of the students electing the work.

The course on Reinforced Concrete (C. E. 557), must either precede this course or be taken at the same time. The course cannot be given unless elected by at least five students. Second semester; 2 credits: laboratory, 1 credit; report, 1 credit. Fee \$3.00. Text: Mills, Materials of Construction.

238. Timber Testing. A special course designed to meet the requirements of the students in Forestry. The work is covered in eight laboratory exercises, embracing cross-bending, compression, shearing, cleavage, and other standard tests of timber; a study of the effect of moisture content on strength; and a study of impact loads. The formulas for the reduction of data from tests are explained; and the students are taught the preparation of neat, accurate reports, such being required on all tests. In general, the methods and bulletins of the U. S. Forest Service will be used as a guide in the work.

Prerequisites: Phys. 1 and 2. Course in Forestry; senior year; second semester; 1 credit. (Note: The work is covered in one three-hours laboratory period a week during the first half of the semester, for which one-half credit is allowed. The other half credit is given for the reports.) Fee \$2.00. Text: Record, Mechanical Properties of Wood.

241. Concrete Laboratory. An elective course designed for those desiring instruction in the testing and proportioning of concrete-making materials. The first half of the course is the same as that of course 231 including principles of sampling, testing of cement and sands, grading of aggregates, etc. The latter part of the course includes tests on reinforcing steel, reinforced beams, water-proofing compounds, thermal conductivity of concrete, and concrete analysis.

Prerequisites: Physics 101 and 102, and Math. 51 and 52. Especially designed as an elective for seniors in Electrical and Mechanical Engineering, but suitable for students in other courses as well. First semester; 2 credits, apportioned 1 to laboratory and

1 to report. Fee \$3.00. Text: Taylor and Thompson, Concrete, Plain and Reinforced. Assigned references.

255. Steam Laboratory. A brief practical course on steam engines, boilers, and auxiliaries, intended for students in Logging Engineering. The work consists of eight exercises, including tests and studies of the following: pressure and vacuum gauges; steam calorimeters; injectors and feed pumps; boilers; slide-valve, automatic, and Corliss engines. A report is required for each exercise.

Note: Elementary Steam Engineering (M. E. 303), must be taken in conjunction with this course.

Course in Logging Engineering; junior year; first semester; 1 credit. Fee \$2.00.

262. Hydraulic Laboratory. Study of methods of measuring water, calibration of weirs, orifices, water meters, etc. Determination of friction and loss of head in pipe lines and fittings. Study of water hammer, and test of hydraulic ram. Tests on water wheel, centrifugal, triplex, and other pumps. The work is covered in fifteen three-hours laboratory exercises, and a report of each test is required.

Prerequisites: Math. 51 and 52, and I. E. 102. Course in Irrigation Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit. Fee \$2.00.

265. Hydraulic Laboratory. A brief course of a practical nature intended to accompany the course in Hydraulics (I. E. 101), for students in Drainage and Irrigation. Studies and tests are made on the following: pressure and vacuum gauges; methods of measuring water; flow of water through pipes and orifices; hydraulic ram; water wheel; and various types of pumps. The work is covered in eight laboratory exercises, a report being required for each.

Note: Hydraulics, I. E. 101, must be taken in conjunction with this course.

Course in Drainage and Irrigation; senior year; first semester; 1 credit. Fee \$2.00.

272. Gas-Engine Laboratory. Study of internal combustion engine fuels, mechanical details of engines, battery and magneto ignition systems, carburetors, and methods of governing. Analysis of gas engine cycles from indicator diagrams. Mechanical efficiency, regulation, and fuel economy tests. Economy, power, and tractive effort of automobiles.

The work is covered in ten laboratory exercises, and a report is required for each.

Prerequisite: The course on Internal Combustion Motors (M. E. 346), must either precede the course, or be taken in conjunction with it. Course in Mechanical Engineering; senior year; second semester; 2 credits; laboratory, 1 credit; reports, 1 credit. Fee \$200. Text: Streeter, Internal Combustion Motors. Carpenter and Diederichs, Experimental Engineering.

291. Experimental Research Problems. An opportunity is given for advanced and suitably prepared students who are interested in engineering research, to work out original problems. These may be either of their own choosing, or suggested by the department, and may cover any subject within the scope of the department laboratories.

Prerequisites: Must be approved in each case, as they would vary with the work proposed. Elective to seniors and graduate students; first semester; 2 credits. Fee to be arranged.

293. Experimental Research Problems. A continuation of course 291.

Elective to seniors and graduate students; second semester; 2 credits. Fee to be arranged.

INDUSTRIAL ARTS

HENRY CLAY BRANDON, Professor
WILLIAM McCULLY PORTER, Instructor
AMBROSE ELLIOTT RIDENOUR, Instructor
CHARLES GEORGE WILTSHIRE, Instructor
DARWIN GREENE THAYER, Instructor
DAVID ELLSWORTH REED, Instructor
MARTIN LEWIS GRANNING, Instructor

There is a steadily increasing demand in Oregon for competent teachers of manual training. These instructors teach in both the elementary and high-school grades. In fact, the up-to-date school provides for manual, or constructive, work of various kinds from the first grade up. The well-trained teacher must therefore understand both the technique and theory of his subject as adapted to the needs of pupils.

Below the seventh grade this manual instruction for both boys and girls is given by the regular grade teachers; but the supervisor and special teacher of manual training should be able to organize this work and correlate it with the other school subjects, and particularly with the later formal course in manual arts.

For the boys, this will take the form of instruction in woodworking, metals, machine shop, and in some schools, vocational training in the various trades. For the girls, it will lead to the study of the several phases of home economics.

A college degree course of the same general standard as the other B. S. courses is provided, in order that the young men who specialize in this field may receive a preparation that will place them on a par with high-school teachers in other branches. The relation of industrial instruction in the elementary and secondary schools to the industries of life, is more fundamental and direct than most of the other branches taught. It also has its important relations to higher education. It becomes necessary, therefore, to give these instructors a training that will make them more than masters of the mechanical processes.

The properly prepared teacher of industrial arts must have an appreciative understanding of the origin and development of the industries; their relation to economic, social, and political life; and a profound conviction of the importance and dignity of their contribution to the progress of mankind. He should also have the broad sympathies of the cultured man, in order to enable him to set before his pupils high and worthy ideals of life. The artisan, artist, or professional man is first of all a man and a citizen, and our schools must make him aware of his high privileges and responsibilities.

The Industrial Arts department is a part of the School of Engineering and has under its supervision all the shop courses offered in the other departments of the College.

Equipment. This department provides the necessary equipment for carrying on the different lines of shop work in the degree and vocational courses.

The Wood Shop, supplied with the best machines and tools the market affords, contains twenty-four double benches of modern design, accommodating forty-eight students. Each bench is provided with patent rapid action vises for holding the work, and is furnished with two sets of hand tools, consisting of rip saws, cutoff saws and backsaws, planes, chisels, marking gauges, try-squares, hammers, dividers, and oilstones. The machine equipment of this shop consists of fifteen wood-turning lathes, each furnished with a set of tools; one iron saw-table with rip and cut-off saws, one hand saw, one jig saw, 24-inch surface planer,

16-inch glue joiner, one hollow chisel mortiser and one belt sander, built by the students, and two grindstones. There are also two glue tables with clamps of various sizes, two electric glue heaters. The power is furnished by two three-phase induction motors of 15- and 5-horse-power.

The Forge Shop contains forty-two down-draught forges of the most approved pattern. Blast is furnished by a steel pressure blower driven by a 10-horse-power induction motor, and the smoke and gases are removed by an 80-inch exhaust fan, driven by a 20-horse-power motor. Each forge is provided with anvil, hammers, hardies, tongs, and other small tools. An emery grinder, built by students, has been added to the equipment. There are also swedge blocks and vises at convenient points in the room for general use.

The Machine Shop contains one 24x24-inch iron planer, one 15-inch shaper, one 12-inch shaper, one universal milling machine, one universal tool grinder, one wet tool grinder, one radial drill, one 20-inch drill press, one sensitive drill press, one 20-inch engine lathe, one 16-inch engine lathe, one 16-inch universal turret lathe, one 14-inch modern geared lathe, five 14-inch engine lathes, two 10-inch speed lathes, one shop saw, one automatic knife grinder, and twelve bench vises. A 20-horse-power induction motor furnishes the power. A tool room adjacent contains the small tools, such as twist drills, taps, dies, reamers, calipers, gauges, and scales. These tools are given out to the students on the check plan.

The Plumbing and Steam Fitting Shop is equipped with all of the hand tools necessary for cutting, threading, and general pipe work, as well as gasoline torches, soldering outfits, and other apparatus for making lead-pipe connections and wiped joints.

The Foundry contains a 22-inch Colliau cupola having a capacity of two tons per hour, one 1200-pound crane ladle, one 800-pound crane ladle, bull ladles, and hand ladles, one 16-inch brass furnace, brass molder's tub, crucibles, one large core-oven, one portable core-oven, one two-ton jib crane, one wall crane for charging floor, one Delano pulley molding machine No. 2, besides shovels, rammers, and small tools to accommodate twenty students at one time. An emery grinder, built by the students, has been added.

DEGREE COURSE IN INDUSTRIAL ARTS

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 81, 82).....	3	3
Trigonometry (Math. 12).....		3
Commercial Geography (Com. 200).....	3	
General Chemistry (Chem. 100, 101).....	3	3
Shop Drawing (Ind. Arts 301, 302).....	2	2
Manual Training (Ind. Arts 103, 104).....	3	3
Industrial Arts Drawing (Art 411).....		2
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. E. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Sophomore Year		
Modern Language or Approved Elective.....	3	3
General Physics (Phys. 1, 2).....	3	3
Patternmaking, Foundry (Ind. Arts 135, 174).....	3	3
Woodwork (Ind. Arts 113).....	2	
Industrial Arts Design (Art 412).....	1	
Drawing (M. E. 156).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Electives	3	3
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year		
Modern Language or Approved Elective.....	3	3
General Psychology (Ind. Ed. 101).....	3	
Principles of Education (Ind. Ed. 131).....		3
Educational Psychology (Ind. Ed. 102).....		2
Forging (Ind. Arts 155).....	2	
Hammered Metal Work (Ind. Arts 156).....		2
Elementary House Planning (Arch. 701).....	3	
Descriptive Geometry (M. E. 152).....		3
Commercial Woods (For. 506).....	2	
Plumbing (Ind. Arts 270).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives	2	
	17	17
Senior Year		
Special Methods (Ind. Ed. 172).....		2
History and Theory of Vocational Education (Ind. Ed. 125)	2	
Machine Shop (Ind. Arts 208, 209).....	2	2
Manual Training for Elementary Grades (Ind. Arts 231)		2
Machine Drawing and Design (M. E. 207).....	3	
Applied Mechanics Lab. (Exp. E. 207).....	3	
Power and Hydraulics Lab. (Exp. E. 208).....		3
Electives	6	7
	16	16

The following courses are offered:

103. Manual Training. Designed to meet the needs of those students who desire to teach manual training in the sixth, seventh, eighth, and ninth grades of the public schools. A course in wood construction and design, including theory and practice in the proper use of tools; a study of the growth and structure of woods; shrinkage, warpage, and seasoning of timber; staining and finishing. Considerable attention is given to a study of shop methods, equipment, courses of study, and proper methods of conducting class work.

Course in Industrial Arts; freshman year; either semester; 3 credits; 3 laboratory periods. Fee \$4.50. Deposit \$2.00. Text: Griffith, Essentials of Woodwork.

104. Manual Training. Continuation of 103; freshman year; either semester; 3 credits; 3 laboratory periods.

Fee \$4.50. Deposit \$2.00. Text: Griffith, Essentials of Woodwork.

106. Woodwork. The purpose of this course is to give instruction in the care and use of modern woodwork benches and their equipment. Six lectures will be given in this course, each lecture followed by a practical application. Skill in the manipulation of tools cannot be obtained in this short time, but instruction and practice will be given in sharpening chisels, planes, and other edge tools; in jointing, setting, and filing handsaws.

The principal feature of this course will be the instruction and practice in the use of the steel square in brace work and rafter construction.

Elective, course in Agriculture; freshman year; first or second semester; 1 credit; 1 laboratory period. Fee \$1.50. Deposit \$2.00.

110. Woodwork. A course for Logging Engineering students, consisting of a series of constructive exercises in carpentry and joining, accompanied by lectures dealing with the care and use of bench tools, and the proper method of laying out work.

Logging Engineering course; freshman year; first semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

111. Woodwork. A continuation of course 110 for Logging Engineering students. This course takes up the use of the steel square in building construction, and the design and construction of trestles, trussed roofs, and timber bridges.

Logging Engineering course; freshman year; second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

113. Woodwork. Correct use of the steel square in laying out practical carpenter work, windowsills and doorsills, bay and circular windows, steps, stairs, etc.; detailed construction of the window and door frames, sills, caps, weights, and fastenings in relation to the rough framework and the exterior and interior finish of the building are taken up.

In like manner, the construction of cornices, gutters, brackets, columns, and newel posts is taken up. As soon as the students become familiar with the detailed construction of the above, they are assigned problems involving original design and construction. Practice in reading plans, filling out material bills, and estimating the cost of material and labor, is a strong feature of the course.

So far as possible, drawings furnished by the architectural department are used in this work.

Industrial Arts and elective; sophomore year; first semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

116. Cabinetwork. This course consists of the designing and construction of furniture according to the ability of the individual student. Mixing of stains, fillers, and various finishes, with their application, is a strong feature of the course.

Included in the work is a study of the design and construction of drawers and panel work, and primary upholstering.

Elective; freshman year; either semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

131. Patternmaking. This course consists of a series of exercises in planing and chiseling to familiarize the student with the proper use of tools; of practical exercises emphasizing the necessity of draught, core prints, core boxes; of exercises showing the necessary allowance for shrinkage of iron and other metals, and its effect on different shapes and thicknesses of castings. Exercises in wood-turning are given in conjunction with lectures on the lathe, its care and management, and the care and use of turning tools. From the simple exercise the student soon advances to the construction of patterns of parts of machinery and other structures, such as pulleys, pipe fittings, valves, gear wheels, dynamo frames, gas and steam engines, lathes, emery grinders, and other pieces of machinery.

The lectures explain the correct methods of constructing the more complicated work, the principles of molding directly related to patternmaking, shrinkage of metals, kinds of lumber best suited for patternmaking, the working and twisting of woods, glue and metal fastenings, making cores and core boxes, methods of marking and storing patterns, estimating the weight of metal castings.

Course in Mechanical and Electrical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: International Correspondence School pamphlets.

132. Patternmaking. This course and the following are a continuation of Patternmaking and are intended for engineering students who desire to devote further time to the subject, or for those who are engaged in the preparation of these, or construction work.

The work will consist largely in making patterns for steam and gas engines and other complicated machines.

Elective; first or second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

133. Patternmaking. This course is offered to students having had the equivalent of a two-credit course in patternmaking, and comprises the construction of the more complicated patterns and core boxes necessary for the building of steam and gas engines or other machine parts.

Elective; first or second semester; 1 credit; 1 laboratory period. Fee \$1.50. Deposit \$2.00.

134. Patternmaking. Continuation of course 132.

Elective; second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

135. Wood Turning and Patternmaking. The principles of wood turning are taken up with reference to their application to the useful arts. This leads to patternmaking, which forms the greater part of the semester's work. One hour a week is used for shop lectures and recitations upon topics of vital importance to the work, such as selection of material, fastenings and joints, shrinkage of wood, allowance for shrinkage of metal, etc.

The course in Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods. Fee \$4.50. Deposit \$2.00. Text: International Correspondence School pamphlets.

136. Patternmaking. This is a continuation of course 135, and is intended for those who desire to obtain a more detailed knowledge of the subject. The student has opportunity to enter more fully into constructive work in patternmaking, by making patterns and core boxes for parts of machines to be built in the College shops.

Elective; junior or senior year; first or second semester; 3 credits; 3 laboratory periods. Fee \$4.50. Deposit \$2.00.

138. Wood Turning. This course consists of a series of exercises in wood turning intended to familiarize the student with the various uses of the lathe tools, methods of centering and chucking, segment work, staining, and polishing. Small pieces of furniture such as vases, bowls, rings, trays, tables, and stools will be worked out.

Elective Industrial Arts course; second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

151. Blacksmithing. The student is taught to make and manage the forge fire; to shape iron by bending, upsetting, drawing, and welding. Many useful articles are made, consisting of hooks, staples, rings, clevises, and chains.

Logging Engineering, Mechanical Engineering, and Electrical Engineering; sophomore year; first semester; 2 credits; 2 laboratory periods. Fee \$3.00.

152. Toolmaking and Tempering. This course is devoted to the study of the heat treatment of steel as exemplified in making and tempering tools, springs, and other articles of steel.

Prerequisite: Course 151. The course in Mechanical Engineering; sophomore year; second semester; 1 credit; 1 laboratory period. The course in Logging Engineering; sophomore year; second semester; 1 credit; 1 laboratory period. Fee \$1.50.

153. Blacksmithing. A course for students in Agriculture. After completing the first exercise, the student enters upon work having direct application to farming, such as the mending of farm implements, making and mending of chains, clevises, and hooks; ironing of whiffletrees and neckyokes; sharpening of tools.

Elective; Agricultural course; sophomore year; first semester; 1 credit; 1 laboratory period. Fee \$1.50.

154. Blacksmithing. A continuation of course 152, for students wishing to take an entire year of blacksmithing.

Elective; sophomore year; second semester; 2 credits; 2 laboratory periods. Fee \$3.00.

155. Forging. This course deals with the equipment of the blacksmith shop, and includes exercises in bending, shaping, upsetting, and welding iron. Some instruction is given also in hardening and tempering steel, and in brazing. The course is accompanied with lectures on the management of the fire, methods of construction, and shop equipment.

The course in Industrial Arts; junior year; first semester; 2 credits; 2 laboratory periods. Fee \$3.00.

156. Hammered Metal Work. This course consists of hand wrought metal and enamel work, including hard and soft soldering, the formation of bowls, trays, boxes, lamp shades. The design and construction of furniture fittings.

The course in Industrial Arts; junior year; second semester; 2 credits; 2 laboratory period. Fee \$3.00.

158. Forging and Tool Dressing. After the minimum amount of preliminary work in forging iron, the remainder of the time is devoted to making, tempering, and dressing chisels, drills, and other steel tools.

The course in Mining Engineering; freshman year; second semester; 2 credits; 2 laboratory periods. Fee \$3.00.

171. Foundry Practice. This course includes a study of the foundry equipment; care and management of cupolas; mixing and melting of iron; molding in green and dry sand; preparation of cores; casting in iron and brass.

The course in Mechanical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Text: International Correspondence School pamphlets.

173. Foundry Practice. A course in all respects equivalent to course 171.

The course in Electrical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Text: International Correspondence School pamphlets.

174. Foundry Practice. More comprehensive than course 171. Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods. Fee \$4.50.

175. Advanced Foundry Practice. Continuation of 171 and 173.

Elective; 2 credits; 3 laboratory periods. Fee \$3.00.

202. Machine Shop. The work in the machine shop includes both bench and machine work. Upon first entering the shop the student is taught the principles of chipping, filing, and hand finishing. This occupies the first half of the semester. Machine work is then taken up through a series of exercises on lathe, shaper, planer, drill press, and milling machine. One hour of the student's time is required each week in the class room to attend lectures, work problems, or prepare other work assigned by the instructor.

The courses in Mechanical and Logging Engineering; sophomore year; second semester; 1 credit; 1 laboratory period. Fee \$1.50. Deposit \$2.00. Text: Halsey, Machine Shop Methods.

203. Machine Shop. A continuation of course 202 devoted to machine construction and milling machine work. Special attention is paid to economical shop methods of doing work.

The course in Mechanical Engineering; junior year; first semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Halsey, Machine Shop Methods.

205. Machine Shop. This and the following courses are a continuation of 203.

Mechanical Engineering course; second semester; 3 credits; 3 laboratory periods. Fee \$4.50. Deposit \$2.00.

206. Machine Shop. A course similar to course 202, designed to meet the requirements of students in Electrical Engineering.

The course in Electrical Engineering; sophomore year; second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Halsey, Machine Shop Methods.

207. Machine Shop. Continuation of 206.

Elective; Electrical Engineering students; junior year; first semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Halsey, Machine Shop Methods.

208. Machine Shop. This course begins with the hand processes of chiseling, filing, and polishing, which are followed by a detailed study of the lathe, drill press, planer, and shaper, taught by means of carefully planned exercises. The course includes one hour a week of lecture or recitation work to supplement the instruction given in the shop.

The course in Industrial Arts; senior year; first semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Halsey, Machine Shop Methods.

209. Machine Shop. A continuation of course 208 in which the student becomes familiar with the more complicated machines such as turret lathes, and milling machines. Shop methods are studied with reference to economical production. The student, as far as possible, enters upon construction of machinery and apparatus for College equipment.

The course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Halsey, Machine Shop Methods.

212. Machine Shop. Similar to 202.

Elective; first semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

213. Machine Shop. Continuation of 212.

Elective; second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

228. Dairy Mechanics. This course is arranged for the students of Dairy Manufactures. An attempt is made to give in a brief way through lectures and laboratory work, a knowledge of plumbing, setting of line shafting, and the operation and repair of

machinery, electric wiring, and the operation of electrical machinery. This work is given by instructors in the plumbing and machine shops, and in the electrical laboratory.

Dairy Manufacturers; senior or junior year; second semester; 1 credit; 1 laboratory period. Fee \$1.50.

231. Manual Training for Elementary Grades. This course deals with the design and construction of cardboard work, weaving, basket and mat work, stencil cutting, bookbinding, and other industrial subjects such as are taught in the first six grammar grades.

Prerequisite or parallel: Ind. Ed. 171. Course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods.

270. Plumbing. Course similar to M-1.

Elective; 2 credits; 2 laboratory periods; first and second semesters. Fee \$3.00.

301. Shop Drawing. This course is intended for those students who are specializing in Industrial Arts. In the beginning the work is devoted to the learning of the elements of drawing, the general use of the drawing instruments, lettering, general constructions, methods of representation and free-hand sketching. Considerable attention will be given to drawing of pieces of furniture and constructions in wood that may be worked out in the shops.

Course in Industrial Arts; first semester; 2 credits; 2 laboratory periods.

302. Shop Drawing. Continuation of 301.

Second semester; 2 credits; 2 laboratory periods.

MECHANIC ARTS

This is a vocational course extending through three years, during which the student devotes at least one-third of his time to shop work and trade drawing. English, mathematics, chemistry, physics, and elementary economics are also included in order to balance the course and give it educational value.

The student is permitted to specialize in the vocational work according to his individual preferences and qualifications. The choice of work includes Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

This is not to be regarded as a preparatory course for the degree courses in engineering. Such preparation can best be obtained in the regular accredited high schools of the State. Neither is it intended that this course shall entice students away from the high schools, but that it shall fill a need not generally provided for by the secondary schools of the State.

It is the purpose of this course to assist those who expect to make their way in the world by their manual skill in various lines of activity—those who feel that they cannot afford to take a degree course in college, but desire to get some vocational training in special lines, and at the same time secure the broadening influence of education in English, mathematics, and elementary science. While it is not the primary aim to train foremen and superintendents, it is believed that students after completing the course and gaining a few years of practical experience will be able to hold positions of responsibility, or to go into business for themselves.

The shops are equipped with the latest approved machinery and are well suited to carry on these practical courses.

This work is open to students who have completed the eighth grade, or equivalent, of the common schools, and who are sixteen years of age. Those who complete the three years of work and take all of the work outlined will be entitled to a diploma. In order to secure a diploma in Patternmaking, Carpentry and Cabinetmaking, Machine Shop Practice, or Plumbing, at least two years must be devoted to the desired subject. The other year may be devoted to selected courses subject to the approval of the head of the department. A general shop course may be taken by combining one year of Machine Shop, one year of Blacksmithing, and one year of Foundry Work; or one year of Woodworking, one year of Foundry, and one year of Machine Shop.

VOCATIONAL COURSE IN MECHANIC ARTS

	Semester	
	1st	2nd
First Year		
Vocational English (Eng. G, H).....	3	3
Algebra (Math. A, B).....	5	5
Elementary Commercial Geography (Com. H).....	2	
Elementary Industrial History (Com. K).....		2
Vocational Drawing (M. E. A-1, B-1).....	2	2
* Shop Work (According to trade selected).....	4	4
Drill (Military A, B).....	1	1
Gymnasium (Phys. Ed. 11, 12).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

* Shop Work. The student will choose the general line of shop work which he desires to pursue from the following: Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

	Semester	
	1st	2nd
Second Year		
Advanced Vocational English (Eng. I, J).....	3	3
Shop Arithmetic (Math. O).....	4	
Plane Geometry (Math. L).....		4
Trade Drawing (M. E. A-2, B-2).....	2	2
Chemistry (Chem. A, B).....	3	3
* Shop Work (According to trade selected).....	4	4
Drill (Military C, D).....	1	1
Gymnasium (Phys. Ed. 13, 14).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Third Year		
Geometry and Trigonometry (Math. T).....	4	
Elementary Industrial Problems (Com. J).....		3
Business Law (Com. P).....	2	
Shop Accounting (Com. F).....		2
Trade Drawing (M. E. A-3, B-3).....	2	2
Physics (Phys. A, B).....	3	3
* Shop Work (According to trade selected).....	4	4
Drill (Military E, F).....	1	1
Electives	2	2
	<hr/> 18	<hr/> 17

The following courses are offered:

C-1. Carpentry and Cabinetmaking. The purpose of this course is to teach the pupil the elements of joinery as applied in cabinetmaking and the building trades. The beginning work is devoted to the principles of joining and to tool operations as involved in furniture making and interior finish, including design and construction, the proper use of tools, growth and strength of woods, shrinkage, warpage, and seasoning of timber, staining and polishing. Considerable attention is given to the making of working drawings of simple pieces of furniture which are built in the shops. A study of the steel square and its uses is taken up the second and the third years, and the practical use of the square are given in brace and detail roof construction. This work will be developed through the construction of parts of houses, barns,

* Shop Work. The student will choose the general line of shop work which he desires to pursue from the following: Cabinetmaking, Pattern-making, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

roofs, and bridges. In like manner, the construction of cornices, gutters, brackets, columns, window frames, and stairways is attempted. The erection of buildings in reduced scale and full sized section of buildings is a strong feature of the course.

Supplementary lectures will be given upon the proper care of edged tools; the various woods used in building construction, their proper selection and treatment; the measurement of lumber, glues, nails, screws, bolts, nuts, pins, straps, and other fastenings. Roof trusses, spans and braces, and method of calculating their proper sizes; stair building, woodworking machinery, paints, shellacs, and varnishes; estimates and practice in working problems that are taken from the student's work, from trade journals and from actual plans and specifications of houses. These are some of the prominent features of the work.

Vocational course; Mechanic Arts.

First year; first semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

D-1. Carpentry and Cabinetmaking. Continuation of C-1.

First year; second semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

C-2. Carpentry and Cabinetmaking. Continuation of D-1.

Second year; first semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

D-2. Carpentry and Cabinetmaking. Continuation of C-2.

Second year; second semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

C-3. Carpentry and Cabinetmaking. Continuation of D-2.

Third year; first semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

D-3. Carpentry and Cabinetmaking. Continuation of C-3.

Third year; second semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

E-1. Patternmaking. The purpose of this course is to teach the elements of machine patternmaking. The student begins his course with exercises involving the use of bench tools, and the reading of working drawings. These exercises emphasize the necessity of draught, core prints, core boxes, of allowance for shrinkage of iron and other metals, and its effect on different shapes and thickness of castings. The student is taught how to join timber to prevent warpage and distortion of patterns by using

segments, staves, ribs, etc. He is taught the meaning of trade names, such as boss, fillet, flange, rib, etc.; how to operate power machinery; to keep in repair belts and line shafting; to sharpen planer, and jointer knives, band saws; and how to select materials, such as glue, lumber, shellac, and fasteners.

Much of the constructive work is upon parts of machines that are being built in the College shops, such as pulleys, pipes, fittings,, valves, gear wheels, dynamo frames, lathes, emery grinders, gas engines, and other machinery.

More advanced work includes the calculation, laying out, and construction of globe valves; spur, bevel, and worm gearing propeller blades and cams.

Vocational course, Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00. Text: International Correspondence School pamphlets.

F-1. Patternmaking. Continuation of E-1.

First year; second semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00. Text: International Correspondence School pamphlets.

E-2. Patternmaking. Continuation of F-1.

Second year; first semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

F-2. Patternmaking. Continuation of E-2.

Second year; second semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

E-3. Patternmaking. Continuation of F-2.

Third year; first semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

F-3. Patternmaking. Continuation of E-3.

Third year; second semester; 4 credits; 4 laboratory periods a week. Fee \$6.00. Deposit \$2.00.

G. Woodworking. This is a course in woodworking, including instruction in the care and use of bench tools. The student becomes an adept in the use of the steel square by exercises in brace and rafter cutting and roof framing, followed by lectures on various types of barn constructions. The practical work involves the construction of models of roofs, trusses, buildings and parts of buildings reduced in scale.

Vocational course in Agriculture; first year; first semester; 2 credits; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

J-1. Course in Forging. The purpose of this course is to teach the principles of forging as applied in the average jobbing shop. It deals with the method of building fires so as to obtain best results in heating; care and operation of fires and forges; the use of tools in the working out of nuts, bolts, bending of eyes, forging staple, gate hooks; bending and welding of rings and links; making of hooks, clevises, and the parts of wagons and farm machinery; the forging of tools of high carbon steel and high speed steel such as chipping chisels, lathes, shapers, planers, and mill tools; blacksmith's and mechanic's hammers knives, hatchets, draw knives, and other tools.

Special attention is given to the composition of iron and the various low and high speed carbon steels; and the treatment especially adapted for each grade, to annealing, tempering, and case hardening, with some lectures on the history and production of iron.

The student will have opportunity to get practical repair work on machinery brought in from the College farm—such work as plow sharpening, wagon and machine repairing. In fact, he will come in contact with most of the work that is done in an average jobbing shop.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$6.00.

K-1. Course in Forging. Continuation of J-1.

First year; second semester; 4 credits; 4 laboratory periods.
Fee \$6.00.

J-2. Course in Forging. Continuation of K-1.

Second year; first semester; 4 credits; 4 laboratory periods.
Fee \$6.00.

K-2. Course in Forging. Continuation of J-2.

Second year; second semester; 4 credits; 4 laboratory periods.
Fee \$6.00.

J-3. Course in Forging. Continuation of K-2.

Third year; first semester; 4 credits; 4 laboratory periods.
Fee \$6.00.

K-3. Course in Forging. Continuation of J-3.

Third year; second semester; 4 credits; 4 laboratory periods.
Fee \$6.00.

L. Blacksmithing. The student enters upon work having direct application to farming, such as the making and mending of farm implements, chains, clevises, and hooks; the ironing of whif-

fle trees and neck yokes; the repairing and sharpening of plows and other farm machinery. Short talks and demonstrations are given on the method of building fires so as to obtain the best results in heating, descriptions of fans and forges, the uses of tools for various forgings, and a study of the proper means of heating and treating materials to be used.

Vocational course in Agriculture; first year; second semester; 2 credits; 2 laboratory periods. Fee \$3.00.

M-1. Course in Plumbing. The purpose of this course is to teach the students those things that will meet the needs of the average plumber. The work consists of instruction and practice in the care and handling of tools; in working with fittings, traps, valves, faucets, etc.; in working with sewer, soil, waste, water, and gas lines; in cutting and threading water pipe to measurements, using different fittings; in making fine and wiping solder, and in wiping upright joints; in laying out and constructing plumbing for buildings of two or more stories, including apartments and offices; in making range boiler and other hot-water connections; and in the practical uses of the soldering iron. The following subjects secure attention: joint wiping under varying conditions, sewer pipe laying, farm plumbing with the use of septic tanks, water supply systems, plumbing without the use of lead, sheet lead working, and estimating of plumbing construction.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$6.00.

N-1. Course in Plumbing. Continuation of M-1.

First year; second semester; 4 credits; 4 laboratory periods. Fee \$6.00.

M-2. Course in Plumbing. Continuation of N-1.

Second year; first semester; 4 credits; 4 laboratory periods. Fee \$6.00.

N-2. Course in Plumbing. Continuation of M-2.

Second year; second semester; 4 credits; 4 laboratory periods. Fee \$6.00.

M-3. Course in Plumbing. Continuation of N-2.

Third year; first semester; 4 credits; 4 laboratory periods. Fee \$6.00.

N-3. Course in Plumbing. Continuation of M-3.

Third year; second semester; 4 credits; 4 laboratory periods. Fee \$6.00.

P-1. Foundry. In the foundry course, the importance of foundry practice in the industrial trades is fully recognized. Modern practices and methods, as carried out in the best commercial foundries, are closely followed. The work is varied and is such as to keep students alive with interest and to tax their ability enough to make them think. The course comprises the following: definition and names of tools, characteristics of molding sands, use and care of tools and flasks. The first exercises are intended to familiarize the student with the proper molding condition of the sand and the correct use of the rammer and other tools. A variety of forms add interest to the work and present progressively the problems of joints, parting lines, follow boards, match plates, gates for molds, pouring basins and shrinkage gates. The patterns in general use are those for the numerous machine projects under development in the Industrial Arts department. Among other things, the student is given work germane to supporting copes, uses of gagers, and the use of solders and how to set them; facings such as sea coal, plumbago, talc, charcoal, and the preparation of facing mixtures; molding with good patterns broken castings, skeleton patterns; sweeps; molding of sheaves, pulleys, manhole covers, and rings; brackets; gas engine cylinders; lathe beds, in open sand and pit work, are emphasized. In core making are given materials of core making, core mixtures, uses of core boxes, sweeps, core arbors, and core rods, provisions for setting large cores by hand and with crane, methods of venting, core baking, and the painting of cores.

In cupola management the student becomes proficient in preparing the cupola for a heat in charging and pouring off.

The work also includes practice in making castings in brass, bronze, and aluminum, and the making of alloys. Additional lectures are given on malleable castings, loam molding, steel founding, mixing and melting of iron, machine molding, and foundry appliances. The student is taught to keep account of the supplies and labor and be in a position to tell the cost of any article produced in the foundry, also the value of such articles as are turned out of commercial shops.

Vocational course; Mechanical Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$6.00. Text: International Correspondence School pamphlets.

Q-1. Foundry. Continuation of P-1.

First year; second semester; 4 credits; 4 laboratory periods. Fee \$6.00. Text: International Correspondence School pamphlets.

P-2. Foundry. Continuation of Q-1.

Second year; first semester; 4 credits; 4 laboratory periods.

Fee \$6.00.

Q-2. Foundry. Continuation of P-2.

Second year; second semester; 4 credits; 4 laboratory periods.

Fee \$6.00.

P-3. Foundry. Continuation of Q-2.

Third year; first semester; 4 credits; 4 laboratory periods.

Fee \$6.00.

Q-3. Foundry. Continuation of P-3.

Third year; second semester; 4 credits; 4 laboratory periods.

Fee \$6.00.

T-1. Machine Shop Practice. For students who specialize in machine shop practice, there is work in chipping and filing straight and plane surfaces, filing two pieces to fit, and instruction in laying off and boring, followed by turning of various kinds of materials at different speeds and estimating of time and cost of work done by using different methods such as with and without gauges, gigs, etc., straight and taper turning, right and left hand thread cutting, single, double, square, and cutting of rack spur bevel and worm gears. There is instruction in the use and classification of gauges, micrometers, and calipers. The advantages of the uses of taps and dies, gigs, and special tools, are taken up; as are also the methods of center squaring, straight and taper turning and fitting, outside and inside screw cutting, chucking and reaming, finishing and polishing, drill tap and mandrel grinding, tap boring, uses of milling machine; tool making, such as taps, reamers, mill cutters, and gauges.

Practical experience is acquired through the construction of machinery, such as lathes, gas engines, steam engines, emery grinders, and through general repair work of the College.

Time cards and stock of material are kept of all work, so that the matter of cost of production is given careful consideration.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$6.00. Deposit \$2.00. Text: Starrett's Hand-book.

U-1. Machine Shop Practice. Continuation of T-1.

First year; second semester; 4 credits; 4 laboratory periods.

Fee \$6.00. Deposit \$2.00. Text: Starrett's Hand-book.

T-2. Machine Construction. Continuation of U-1.

Second year; first semester; 4 credits; 4 laboratory periods.

Fee \$6.00. Deposit \$2.00.

U-2. Machine Construction. Continuation of T-2.

Second year; second semester; 4 credits; 4 laboratory periods.

Fee \$6.00. Deposit \$2.00.

T-3. Tool and Gig Making. Continuation of U-2.

Third year; first semester; 4 credits; 4 laboratory periods.

Fee \$6.00. Deposit \$2.00.

U-3. Tool and Gig Making. Continuation of T-3.

Third year; second semester; 4 credits; 4 laboratory periods.

Fee \$6.00. Deposit \$2.00.

MECHANICAL ENGINEERING

GRANT ADELBERT COVELL, Professor
MARK CLYDE PHILLIPS, Associate Professor
OTTO BERGER GOLDMAN, Assistant Professor
JOSEPH BENJAMIN YODER, Instructor

The course in Mechanical Engineering has for its purpose the preparation of young men for positions of usefulness and responsibility in the industrial life of the country.

The Pacific Northwest is just now entering upon a period of rapid progress in the building of railroads, the development of water power, the marketing of forest products, and the upbuilding of manufactories, all of which require men conversant with the general principles of engineering. It is the purpose of all engineering courses to contribute to this general advancement, by turning out graduates equipped with the necessary knowledge and skill to make them active factors in this great work.

It is the general plan of the course in Mechanical Engineering to lay a broad foundation in English, Mathematics, Chemistry, and Physics, accompanied by Drawing and Shopwork, during the first two years of the course. The work of the last two years is more technical and professional in its nature, consisting in a study of the principles involved in the development of power by steam engines, water wheels, gas and gasoline engines, and steam turbines. It also involves a critical study of the design of machines and materials entering into their construction, as well as tests to determine their efficiency.

Instruction is given by means of lectures, recitations, and laboratory exercises. The scientific principles involved in machines

and mechanical movements to the solution of problems in mechanical engineering. In the shops, the student learns the use of tools and the value of different methods of doing work from the standpoint of economical construction. In the draughting room, he learns to make working drawings and blueprints of machines, and to formulate designs of his own.

With these advantages to aid him, the ambitious student should be able to take and maintain a position in the general industrial and engineering development which is the leading and characteristic feature of the age in which we live.

Equipment. The laboratory equipment for this department in mechanics and power measurement, is described under Experimental Engineering. The shops are under the supervision of the department of Industrial Arts.

In addition to equipment listed under these two departments, there are two large draughting rooms, each with 40 drawing tables, drawing boards for each student, and a blue-print room, with printing frame, wash trays, etc.

DEGREE COURSE IN MECHANICAL ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (English 81, 82)*.....	3	3
Trigonometry (Math. 11).....	3	
College Algebra (Math. 21).....	2	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100, 101).....	3	3
Mechanical Drawing (M. E. 151).....	2	
Descriptive Geometry (M. E. 152).....		3
Foundry (Ind. Arts 171).....	2	
Patternmaking (Ind. Arts 131).....		2
Library Practice (Libr. 1).....	1½	
Hygiene (Phys. Ed. 10).....	1½	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	1½	1½
	<hr/> 17½	<hr/> 17½

* Upon approval of the Dean, students may substitute a Modern Language for English in the freshman year and for Commercial Geography and the Principles of Economics in the sophomore year.

	Semester	
	1st	2nd
Sophomore Year		
Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Physics 101, 102).....	4	4
Mechanical Drawing (M. E. 153).....	3	
Mechanism (M. E. 204).....		3
Commercial Geography (Com. 200)*.....	3	
Principles of Economics (Com. 210)*.....		3
Blacksmithing (Ind. Arts 151).....	2	
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind. Arts 202).....		1
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Elements of Thermodynamics (M. E. 319).....	3	
Thermodynamics (M. E. 320).....		3
Applied Mechanics Laboratory (Exp. E. 201).....	3	
Power and Hydraulic Laboratory (Exp. E. 202).....		3
Graphic Statics (C. E. 511).....	2	
Machine Shop (Ind. Arts 203, 205).....	2	3
Hydraulics (I. E. 102).....		3
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
	<hr/>	<hr/>
	17	17

* Upon approval of the Dean, students may substitute a **Modern Language** for English in the freshman year and for **Commercial Geography** and the **Principles of Economics** in the sophomore year.

	Senior Year	Semester	
		1st	2nd
Machine Design (M. E. 205, 206).....		4	3
Power Plant Engineering (M. E. 321).....		2	
Electrical Machinery (E. E. 403).....		3	
Power Plant Design (M. E. 323).....			3
Advanced Mechanics Laboratory (Exp. E. 203).....		3	
Advanced Power Laboratory (Exp. E. 204).....			3
Gas Engine Laboratory (Exp. E. 272).....			2
Power Plant Engineering (M. E. 322).....			2
Heating and Ventilating (M. E. 331).....		3	
Seminar (M. E. 351, 352).....		1	1
Elective			2
		16	16

The following courses are offered:

151. Mechanical Drawing. The use of instruments and elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, principles of orthographic projection, etc., supplemented by recitations and lectures from a standard text.

As soon as practicable the copy sheets are discontinued and the student is required to make sketches and working drawings of typical machine details, such as pulleys, fly wheels, crank shafts, pump details, etc., from actual machines available in shops and drawing room. In addition, a special drill in free-hand lettering is given at the beginning of each period throughout the course.

Electrical Engineering, Mechanical Engineering; freshman year; Logging Engineering, sophomore year; first semester; 2 credits; 2 laboratory periods. Text: French, Engineering Drawing.

152. Descriptive Geometry. This course consists of the graphic solution of problems involving the projection of lines, surfaces, and solids. Special effort is made to make the work as practical as possible and to make clear the application of Descriptive Geometry to actual drafting-room problems.

Electrical Engineering, Mechanical Engineering, Mining Engineering; freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Text: Ferris, Elements of Descriptive Geometry.

153. Mechanical Drawing. A continuation of course 151 and includes laying out of gear-teeth curves and conventional methods

of representing different kinds of gears. Exercises in structural-steel drafting are also given, as well as sheet-metal layouts of a large variety of intersections, joints, etc., from principles learned in Descriptive Geometry. The remainder of the semester is devoted to practical machine drafting of machines and apparatus to be built in the College Shops. All articles built in the Shops are first detailed in the drawing room by the students from sketches and other data, and blueprints sent to pattern and machine shops. A number of standard sizes and a standard title are used, and every effort is made to have the work conform as closely as possible to good drafting-room practice.

Electrical Engineering and Mechanical Engineering; sophomore year; first semester; 3 credits; 3 laboratory periods. Text: French, Engineering Drawing.

204. Mechanism. A study of mechanical movements, including velocity ratios; transmission of motion by linkwork, gearing, cams, and belting.

The course in Electrical and Mechanical Engineering; sophomore year; second semester; 3 credits; 2 recitations; 2 two-hours laboratory periods. The course in Logging Engineering; junior year; second semester; 3 credits; 2 recitations; 2 two-hours laboratory periods. Text: Keown, Elements of Mechanism.

205. Machine Design. This course consists largely in applying the principles discussed in mechanism and in mechanics to the design of machine parts. The work includes among other things the study of screws, fastenings, shafting, belting, fly wheels, wheels, gearing, and machine frames.

Senior year; first semester; 4 credits; 3 recitations; 1 laboratory period. Text: Kimball and Barr, Machine Designs.

206. Machine Design. This course supplements and is directly dependent upon the recitation work of course 125.

The work is taken up from a practical point of view and applies such theory as is consistent with the approved methods of design. Designs and complete working drawings are made of machines.

Senior year; second semester; 3 credits; 3 laboratory periods. Text: Kimball and Barr, Machine Designs.

207. Machine Drawing and Design. A course in mechanical drawing involving the elementary principles of machine design.

Industrial Arts course; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

251. Statics and Dynamics. This is essentially a course in theoretical and applied mechanics. Force systems are analyzed and their effects upon rigid bodies, both at rest and in motion, are carefully studied. Methods of finding centers of gravity and moments of inertia are investigated, and their practical application is brought to the student's attention by solving a number of problems. The principles of work, energy, friction, and impact, are all studied with reference to their importance in the field of engineering.

Prerequisites: Differential and Integral Calculus, Math. 51, 52. All courses in Engineering; junior year; first semester; 5 credits; 5 recitations. Text: Hancock, Applied Mechanics for Engineers.

252. Strength of Materials. In this course the general principles of mechanics are applied to the elements of engineering structures to determine their strength and fitness.

Some of the features are tensile and crushing strength of different engineering materials; strength and stiffness of beams or girders under different systems of loading, and various methods of support; supporting power of posts or columns; the application of torsion to shafts as a means of transmitting power.

The work throughout is exemplified by numerous problems which the student is required to solve.

Prerequisite: Statics and Dynamics, M. E. 251. All courses in Engineering; junior year; second semester; 3 credits; 3 recitations. Text: Boyd, Strength of Materials.

254. Elementary Mechanics. A study of some of the general principles and applications of mechanics without the use of the calculus. The relations of force, mass and velocity are discussed with special reference to their application in finding stresses in framed structures, and cables. Work, energy, and power are also briefly considered.

The course in Logging Engineering; senior year; second semester; 3 credits; 3 recitations.

302. Road Machinery. This course is designed to familiarize the student with the purpose, care, and manipulation of the different forms of power-driven road machinery, both steam and gas, as exemplified in modern road construction.

The course in Highway Engineering; senior year; first semester; 1 credit; 1 laboratory period.

310. The Practice of Engineering and Design. The application of cost analysis to practical engineering problems. The design

of power plants with special reference to economy of investment and operation, together with a study in the choice of size of units for given load variation for best plant efficiency, growth and load factors, contracts, specifications, and the purchase and sale of equipment according to best American practice.

Primarily for graduates. Prerequisite: Power Plant Design, M. E. 323, must be taken in conjunction unless credit therein has already been obtained. Elective senior year. Three credits; two-drawing periods and one recitation; second semester.

317. Heat Engines and Boilers. An elementary course in the fundamentals of steam and gas engines, boilers and auxiliaries, together with the principles of combustion.

Course in Logging Engineering; junior year; first semester; 2 credits; 2 recitations. Text: Allen and Bursley, Heat Engines.

318. Heat Engines and Boilers. A more advanced course than 317, covering the elements of thermodynamics, of steam and gas engines, turbines, boilers and power plant auxiliaries, together with the principles of combustion.

Course in Electrical Engineering; junior year; first semester; 3 credits; 3 recitations. Text: Allen and Bursley, Heat Engines.

319. Elements of Thermodynamics. A thorough study of the thermodynamics of perfect gases, gas cycles, and combustion, together with a study of fuels, furnaces, draft apparatus, boilers and boiler auxiliaries, and steam generation.

Prerequisite: Diff. and Int. Calc. Math. 51 and 52. Course in Mechanical Engineering; junior year; first semester; 3 credits; 3 recitations.

320. Thermodynamics. A continuation of course 319. A thorough study of the thermodynamics of vapors, steam engine cycles, together with a study of steam and gas engines, turbines, compressors, engine valve gear, governors and auxiliaries.

Prerequisite: Elements of Thermodynamics, M. E. 319. Course in Mechanical Engineering; junior year; second semester; 3 credits; 3 recitations.

321. Power Plant Engineering. A study in the choice and coordination of power equipment and its assembly, of foundations and buildings, and the combination of power plant machinery with other equipment, together with elementary cost study.

Prerequisite: M. E. 319 and 320. Course in Mechanical Engineering; senior year; first semester; 2 credits; 2 recitations. Text: Handbook M. E., also Cambria.

322. Power Plant Engineering. A more thorough study of the assembly of power plant machinery, foundations and building, elevating and conveying machinery, water treating plants together with a more advanced study of cost analysis.

Prerequisite: M. E. 321. Course in Mechanical Engineering; senior year; second semester; 2 credits; 2 recitations. Text: M. E. Handbook, also Cambria.

323. Power Plant Design. The complete design and layout of power plants, elevating and conveying machinery, foundations and buildings, alone and in combination with other machinery, in accordance with best practice, and from blue prints of actual power plants machinery as built by the best American manufacturers.

Courses in Mechanical Engineering; second semester; 3 credits; 3 laboratory periods.

325. Compressed Air and Refrigeration. A course devoted to the theory, design, and operation of air compressors, fans, and blowers, the first part of the semester, and to the study of the theory and operation of commercial refrigeration systems the latter part.

Prerequisite: M. E. 305. Elective in the senior year of the Mechanical and Electrical Engineering courses; first semester; 2 credits; 2 recitations. Text: Thorkelson, Air Compression and Transmission.

331. Heating and Ventilating. Study of modern methods for the heating and ventilating of buildings. An outline of the work includes a study of several approved systems of heating by means of steam, hot water, or air; methods of computing radiating surface; effective methods of ventilation; general design; construction, and operation of plant.

The course in Mechanical Engineering; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Text: Hoffman, Heating and Ventilation.

346. Internal Combustion Engines. A study of gas cycles and the losses in the actual engines. Consideration of the various types of engines and their adaptation in practice together with a close study of the value of the internal combustion engines as power producers, as compared with other prime movers.

Elective; senior year; second semester; two credits; two recitations. Text: Streeter, Internal Combustion Motors.

351. Seminar. The seminar meets once each week to study progress and development in the field of mechanical engineering.

Technical literature will be reviewed; assignments will be made in advance, covering new or special features of engineering work. Students are required to submit carefully prepared reports, criticisms, or comments.

The course in Mechanical Engineering; senior year; first semester; 1 credit; 1 recitation.

352. Seminar. A continuation of course 351.

The course in Mechanical Engineering; senior year; second semester; 1 credit; 1 recitation.

A-1. Vocational Drawing. Similar to M. E. 151 except more stress is laid on the elementary principles, as the course is designed for students who have had no high-school training in drawing.

Vocational course; Mechanic Arts; first year; first semester; 2 credits; 2 laboratory periods.

B-1. Vocational Drawing. A continuation of A-1.

Vocational course; Mechanic Arts; first year; second semester; 2 credits; two laboratory periods.

A-2. Vocational Drawing. Continuation of B-1. As the student becomes competent he is given practical machine drafting on work through the shops, similar to that of M. E. 153.

First semester; 2 credits; 2 laboratory periods.

B-2. Vocational Drawing. Continuation of A-2.

Second year; second semester; 2 credits; 2 laboratory periods.

A-3. Vocational Drawing. Continuation of B-2.

Third year; first semester; 2 credits; 2 laboratory periods.

B-3. Vocational Drawing. Continuation of A-3.

Third year; second semester; 2 credits; 2 laboratory periods.

SCHOOL OF FORESTRY

GEORGE WILCOX PEAVY, Dean School of Forestry
JOHN POMOROY VAN ORSDEL, Professor Logging Engineering
HAROLD STEPHENSON NEWINS, Associate Professor of Forestry
CHARLES JUNIUS CONOVER, Instructor

Assistant in Logging Engineering

NON-RESIDENT LECTURERS LOGGING ENGINEERING

- L. J. WENTWORTH, Vice President and General Manager, Portland Lumber Co., Portland, Ore.: "Employer and Employee Relationship."
H. C. CLAIR, General Manager Clark County Logging Co., Portland, Ore.: "Logging Management."
J. S. O'GORMAN, Manager Wisconsin Timber & Logging Co., Portland, Ore.: "Labor Management."
J. M. MEANY, Western Representative, Clyde Iron Works, Portland, Ore.: "Clyde Skidders."
DR. D. J. SHIELDS, American Red Cross Society, Washington, D. C.: "First Aid."
M. R. COLBY, Colby Engineering Co., Portland, Ore.: "Lumber Handling Devices."
E. B. HAZEN, General Manager, Bridal Veil Lumber Co., Bridal Veil, Ore.: "Planing Mill Practice and Management."
GEO. M. CORNWALL, Editor The Timberman, Portland, Ore.: "Your Relation to Your Future Employer."
A. G. LABBE, Vice President, Willamette Iron & Steel Works, Portland, Ore.: "Donkey Engines."
C. B. PADDOCK, Chief Inspector Hartford Steam Boiler Inspection and Insurance Co., Portland, Ore.: "Steam Boilers."
DR. J. D. HILL, Holt Tractor Co., Portland, Ore.: "Auto Log Tractors."
G. K. WENTWORTH, Jr., Treasurer Portland Lumber Co., Portland, Ore.: "Auto Lumber Tractors."
A. J. RUSSELL, Manager Santa Fe Lumber Co., San Francisco, Cal.: "Lumber Salesmanship."
W. W. PEED, President Pacific Logging Congress, Eureka, Cal.: "Red Wood Logging."
A. J. KARR, Manager Columbia River Log Scaling and Grading Bureau, Portland, Ore.: "Log Scaling."
E. V. VACHON, Seattle Car and Foundry Co., Portland, Ore.: "Logging Railroad Rolling Stock."
A. M. HAGEN, Superintendent of Manufacture, Booth-Kelly Lumber Co., Eugene, Ore.: "Lumber Manufacture."
MR. DONALDSON, Secretary Willamette Valley Lumber Manufacturers' Association: "Lumber Rates and Tariffs."
AUSTIN CARY, U. S. Forest Service: "Lumbering in the Northeastern United States."
E. O. SIECKE, Deputy State Forester: "State Forest Policy."
T. T. MUNGER, U. S. Forest Service: "Management of Western Yellow Pine."
C. S. CHAPMAN, Secretary Oregon Forest Fire Association: "Association Methods in Fire Control."
J. V. HOFFMAN, U. S. Forest Service: "The Problem of Forest Replacement."
O. P. M. GOSS, Consulting Engineer, West Coast Lumbermen's Association: "Structural Timbers."

ALUMNI ADVISORY COMMITTEE

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S. A. WILSON, Portland, Ore.
T. J. STARKER, U. S. Forest Service, Sumpter, Ore.

Oregon is the foremost timber state in the Union. Of the standing timber remaining uncut in the United States fully twenty percent is within the boundaries of the State of Oregon. According to the best available estimates, this stumpage aggregates approximately 538 billion feet, board measure. Over 11 million acres of timber land, carrying 404 billion board feet of timber are privately owned and 13 million acres, carrying 134 billion board feet, are in the National Forests. The timber in private hands is being cut as the interest of the owners direct. That in public ownership is being sold according to the requirements of the local markets. All National Forest timber is for sale.

This dual ownership of timber opens up two fields. The first is distinctly that of harvesting an immense crop of mature timber. Under the present system of taxation and with the prevailing rates of interest, private enterprise cannot profitably grow timber. The interest of the private owner is largely at an end with the removal of the standing timber. The work of harvesting the timber crop is the sphere of the logging engineer. The domain within the National Forests is dedicated to the production of timber for all time. It is the policy of the Forest Service to restock the cutover areas and to plant all denuded areas which are capable of growing timber. The planting, growing, and protecting of timber crops is the special field of the technical forester.

The Profession of Logging Engineering. The profession of logging engineering is of recent development. In the past, low prices for standing timber, easy logging, and high prices for lumber have made profits to the lumberman sure, and these same conditions have not demanded economy in operation. With high-priced stumpage, timber difficult of access, and low prices for lumber, a revolution in the entire lumber industry is being forced. It has become a case of economy in operation or financial failure. Bringing the logs over rough country to the mill involves many engineering problems. Among these are the construction of logging railroads, the installation of efficient sky-line and ground logging devices, and the operation of special steam and electrical logging equipment. The course in Logging Engineering is designed to equip young men to be of use in this field. The course as outlined in this catalogue was prepared under the direction of some of the ablest timbermen in the Pacific Northwest, and the strictly technical subjects in the course are taught by one of the foremost logging engineers in the United States.

Advantages of the West. The forests of the United States are in the West. In this region the student of forestry is in immediate contact with the conditions he is studying. Oregon alone has 24 million acres of forest land. The greater part of this acreage is west of the Cascade Mountains and consequently easily accessible from the College at Corvallis. Thus, an immense laboratory for observation and field work is at the very doors of the School of Forestry. In the spring of each college year students in both forestry and logging engineering go out on some timber tract for a period of two weeks of practical field work. The men are divided into small crews and an area of several thousand acres of timber is carefully surveyed, cruised, and mapped under the supervision of experienced men. Advanced students make special trips for the purpose of studying the various types of logging and milling operations. Some of the largest sawmills in the world are but two hours travel from the College. Pulp mills, wood distillation plants, box and furniture factories are easily accessible. In addition to this, summer work in the forests or in logging camps is easy to obtain, and is expected of all forestry and logging students. All this points to the fact that Oregon is the ideal place to study general forestry and logging engineering.

Forestry work in this country is yet in its infancy; but it is developing rapidly. When the full economic importance of our forest resources is understood, more intensive methods will be required and many times the number of men now employed will be needed. The Forest Service is steadily raising the requirements for admission to its ranks. Nontechnical men who cannot meet the new requirements are naturally retired. The field for the technically trained man is consequently becoming broader. The State, too, is feeling the need of trained men in forest-protection work. As time goes on this field will be more extensive.

The work in both branches of forestry, that is, in general forestry and in logging engineering, is in charge of technically trained men, all of whom have had practical experience in their respective lines of work. In neither course, however, are technical subjects permitted to crowd out other subjects requisite in an education. The logging engineer and the forester are prepared for citizenship by courses in sociology, political economy, state and local government, tax and labor problems, and other kindred subjects. The fact that the professional man should be prepared for leadership in his community, as well as for success in his chosen work, is always kept clearly in view.

To give those students who so desire an opportunity to secure a broader foundation in subjects basic to logging engineering, as well as to provide time for cultural work and advanced professional training, a five-years course in logging engineering is offered for the first time.

Equipment. The School of Forestry is now provided with suitable space in which to do its work. A three story building, eighty feet wide and one hundred and thirty-six feet long, has been constructed to house the work of the school. This building contains roomy laboratories for work in silviculture, dendrology, mensuration, forest protection, timber technology, drafting, timber grading, and logging devices and equipment. Through the kindness of the manufacturers of logging equipment and lumber manufacturing concerns, much valuable material has been assembled for demonstration purposes.

In addition to the laboratories, class rooms, and offices, space is devoted to a collection of manufactured wood products, designed to show the various uses to which wood may be put, and to educate students in the proper utilization of Oregon's greatest natural resource. All available publications dealing with general forestry, logging, or lumber manufacture are provided for the use of students.

DEGREE COURSE IN GENERAL FORESTRY

The following subjects are recommended for students who desire to work for a degree in general forestry. For graduation the College requires the student to complete 136 credit hours. Of this number he is expected to take 60 hours of professional work, 25 hours of science, and 6 hours in mathematics. The balance of the required 136 hours may be made up of subjects outlined in the recommended course or of those approved by the Dean of the School. Only in exceptional cases will the outlines for the freshman and sophomore years be modified.

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 83, 86).....	2	2
Trigonometry (Math. 14).....	3	
Elementary Analysis (Math. 34).....		3
General Forestry (For. 101, 102).....	3	2
Elementary Mensuration (For. 304).....		3
Plane Surveying (C. E. 234).....		3
General Chemistry (Chem. 100, 101).....	3	3
Forest Geology (Min. 161).....	3	
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1,2).....	1	1
First Aid (Phys. Ed. 23).....	1	
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Sophomore Year		
Blacksmithing (Ind. Arts. 151).....		2
General Physics (Phys. 1, 2).....	3	3
Mensuration (For. 305).....	3	
Topographic Surveying (C. E. 235).....	3	
Silviculture (For. 201, 202).....	3	3
Forest Botany (Bot. 30, 31).....	3	3
Forest Protection (For. 505).....		3
Elementary Forest Mapping (For. 303).....		2
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
	<hr/> 16 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Mensuration (For. 301).....	5	
Log Scaling (For. 307).....		2
Identification of Woods (For. 508).....		3
Forest Entomology (Ento. 304).....		3
Advanced Silviculture (For. 203, 204).....	3	2
Elementary Economics (Com. 210).....	3	
Forest History and Economics (For. 103).....		3
Uses of Wood (For. 507).....	2	
Military Science (Theo. Inst. 1, 2).....	1	1
Military Drill (Military 5, 6).....	1	1
	18	18

Senior Year

Forest Finance (For. 401).....		4
Economics of Lumber Industry (For. 403).....	4	
Dendrology (For. 501).....	5	
Lumbering Management (For. 407).....		4
Forest Improvement (For. 405).....	3	
Timber Technology (For. 502).....		4
Timber Testing (Exp. E. 238).....		1
Forest Appraisals and Reports (For. 306).....	3	
Seminar (For. 408, 409).....	1	1

Suggested Electives

Dendrology (For. 503).....		3
Forest Pathology (Bot. 37).....		1
Economic Zoology (Zool. 108, 109).....	3	3
Labor Problems (Com. 213).....		3
Range and Pasture Botany (Bot. 36).....	3	

DEGREE COURSE IN LOGGING ENGINEERING
(Four-Years Course)

The following subjects are recommended for those students in logging engineering who desire to devote the customary four years to their college course. For graduation the College requires the student to complete 136 credit hours. Of this number he is expected to complete 60 hours in professional work, 10 hours in general

science, 10 hours in mathematics, and the balance of the required 136 hours in the general subjects as outlined or as approved by the Dean of the School. Only in exceptional cases will the outlines for the freshman and sophomore years be modified.

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 85-a, 86-a).....	2	2
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31).....		5
Chemistry (Chem. 100).....	3	
General Forestry (For. 101, 102).....	3	2
Plane Surveying (C. E. 234).....		3
Elementary Mensuration (For. 304).....		3
Wood Working (Ind. Arts 110, 111).....	2	2
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2).....	1	1
	<hr/>	<hr/>
	17 $\frac{1}{2}$	18 $\frac{1}{2}$

Sophomore Year		
Engineering Physics (Phys. 101, 102).....	4	4
Topographic Surveying (C. E. 235).....	3	
Mensuration (For. 305).....	3	
Blacksmithing (Ind. Arts 151).....		2
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind Arts 202).....		1
Railroad Surveying (C. E. 274).....		4
Silvics (For. 205).....	3	
Tree Identification (For. 206).....		4
Principles of Economics (Com. 210).....	3	
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Adv. Mensuration (For. 301).....	5	
Log Scaling (For. 307).....		2
Advanced Forest Mapping (For. 317).....	2	
Logging Machine Design (For. 316).....		2
Efficiency Systems (For. 313).....		2
Timber Technology (For. 502).....		4
Timber Testing (Exp. Eng. 238).....		1
Heat Engines and Boilers (M. E. 317).....	2	
Steam Laboratory (Exp. Eng. 255).....	1	
Uses of Wood (For. 507).....	2	
Identification of Woods (For. 508).....		2
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
	17	18
Senior Year		
Economics of Lumber Industry (For. 403).....	4	
Forest Finance (For. 401).....		4
Topographic Logging Plans (For. 308).....	4	
Logging Devices and Equipment (For. 604, 605).....	4	4
Lumbering Management (For. 407).....		4
Logging Railroads (For. 601).....	4	
Logging Methods (For. 315).....		2
Forest Appraisals and Reports (For. 306).....	3	
Mechanics (M. E. 254).....		3
	19	17

DEGREE COURSE IN LOGGING ENGINEERING

(Five-Years Course)

Due to the complex character of the work demanded of the logging engineer, and to the desire on the part of many of those who are preparing for the profession for a broader training both in fundamental and general cultural subjects, a five-years course leading to the degree of Logging Engineer is offered for the first time. Students who complete the first four years of this course will receive the degree of Bachelor of Science in Logging Engineer-

ing. Those who complete the full five-years course, and who receive the recommendation of the Dean of the School and the head of the department of Logging Engineering, will be granted the graduate degree of Logging Engineer.

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 85, 86).....	2	2
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100).....	3	
General Forestry (For. 101, 102).....	3	2
Plane Surveying (C. E. 234).....		3
Elementary Mensuration (For. 304).....		3
Wood Working (Ind. Arts 110, 111).....	2	2
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$

Sophomore Year		
Differential Calculus (Math. 51).....	4	
Engineering Physics (Phys. 101, 102).....	4	4
Blacksmithing (Ind. Arts 151).....		2
Topographic Surveying (C. E. 235).....	3	
Mensuration (For. 305).....	3	
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind. Arts 202).....		1
Railroad Surveying (C. E. 274).....		4
Silvics (For. 205).....	3	
Tree Identification (For. 206).....		4
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 18 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Principles of Economics (Com. 210).....	3	
General Geology (Geol. 135).....		3
Advanced Mensuration (For. 301).....	5	
Log Scaling (For. 307).....		2
Adv. Forest Mapping (For. 317, 318).....	2	2
Logging Machine Design (For. 316).....		2
Uses of Wood (For. 507).....	2	
Identification of Woods (For. 508).....		2
First Aid (Phys. Ed.).....		1
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Mil. 5, 6).....	1	1
	—	—
	17	17

Senior Year		
Advanced Commercial Law (Com. 309).....	3	
Cost Accounting (Com. 150).....	3	
Economics of Lumber Industry (For. 403).....	4	
Forest Finance (For. 401).....		4
Elementary Mechanics (M. E. 254).....		3
Heat Engines and Boilers (M. E. 317).....	2	
Steam Laboratory (Exp. Eng. 255).....	2	
Elements of Electrical Machines (E. E. 403, 406).....	3	3
Efficiency Systems (For. 313).....		2
Timber Technology (For. 502).....		4
Timber Testing (Exp. Eng. 238).....		1
	—	—
	17	17

	Graduate Year	Semester	
		1st	2nd
Logging Railroads (For. 601).....		4	
Advanced Logging Railroads (For. 606).....			4
Topographic Logging Plans (For. 308).....		4	
Logging Devices and Equipment (For. 604, 605).....		4	
Lumbering Management (For. 407).....			4
Lumber Manufacture (For. 602).....		2	
Logging Methods (For. 315).....			2
Forest Appraisals and Reports (For. 306).....		3	
Special Problems			2
		17	16

Suggested Electives

Forest Mapping (For. 303).....	2	
Commercial Lectures (For. 411).....	1	
Labor Problems (Com. 213).....		3
Forest Protection (For. 505).....		3

SUGGESTED SHORT COURSE SUBJECTS

Forest Protection (For. A, B).....	3	3
Forest Measurements (For. C, D).....	3	3
Forest Surveying and Mapping (For. E, F).....	3	3
Forest Improvements (For. G, H).....	3	3
Forest Administration (For. K, L).....	1	1
	13	13

The following courses are offered:

101. **General Forestry.** The responsibility of the nation in the conservation of its natural resources. The vital interest of the nation in its timber, coal, iron, water, etc. Appropriate methods of insuring longest and best use of these natural resources.

Forestry; freshman year; first semester; 3 credits; 3 lectures and recitations. Reference text: Van Hise, Conservation of Natural Resources.

102. **General Forestry.** Preliminary survey of the whole field of forestry. Forest regions of the United States and the commercial trees native to those regions. Forest ownership, private,

state, and national. Elements of state and national forest policy. Economic importance of the forests of the state and nation.

Freshman year; second semester; 2 credits; 2 lectures and recitations. Reference text: Moon and Brown, Elements of Forestry.

103. Forest History and Economics. The development of European forestry. Progress of American forestry. The economic importance of forest products. Transportations as affecting the lumber industry.

Forestry; junior year; second semester; 3 credits; 3 lectures and recitations. Reference text: Fernow, Economics of Forestry.

201. Silviculture. The art of establishing, developing, and reproducing trees, including their life-history, influences, modification, and growth. Forest description, covering general problems. Silviculture systems of cutting, such as, selection, clear cutting, and coppice. Marking trees for various cuttings. Silvicultural management.

Forestry; sophomore year; first semester; 3 credits; two-hours lecture; three-hours field work. Reference text: Graves, Handling of Woodlands. Fee \$1.50.

202. Silviculture. The improvement of woodlands; clearings; thinnings; damage cuttings. Protection as related to silviculture. Forestation, including seed production, seed collection, seed preservation, and seed testing. Natural versus artificial regeneration. Nursery Practice. Planting. Afforestation.

Prerequisite: Forestry 201. Forestry; sophomore year; second semester; 3 credits; 2 lectures; three-hours field work. Reference text: Graves, Handling of Woodlands. Fee \$1.50.

203. Advanced Silviculture. The practice of forestry in each silvicultural region of the United States, including study of physiography, management, protection, types, silvical characteristics of important species, and market relations. Forest ecology, dealing with the reciprocal relations between trees and forests and their environment, including a study of types and their classification, forest formations, climatic characteristics, soils investigations, antecology, sinecology, and ecological experiments.

Prerequisite: Forestry 201 and 202. Forestry; junior year; first semester; 3 credits; 2 recitations and 1 laboratory period. Fee \$1.50.

204. Advanced Silviculture. Silvics, including the measure of tolerance, study of sample plots, economic possibilities of species,

and reproduction characteristics. Each student will be required to make a detailed silvical study of some definite forest tract and present a thesis covering the work.

Prerequisites: Forestry 201, 202, and 203. Forestry; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.50.

205. Silvics. Influence of the forest on stream flow and climate. Geographical and local distribution of trees by species. Tree reproduction. Tolerance. The relationship between trees and their environment.

Logging Engineering; sophomore year; first semester; 3 credits; 2 lectures; 1 field period. Fee \$1.50.

206. Tree Identification. Field characteristics and classification of timber trees of United States, their commercial range, local occurrence, size, growth, form, climatic soil and moisture requirements, resistance, relative tolerance and reproduction. The fundamental purpose of this course is to teach the student to know commercial timber trees.

Logging Engineering; sophomore year; second semester; 4 credits; 3 lectures; 1 field period. Reference text: Sudworth, Trees of the Pacific Slope. Fee \$1.50.

301. Advanced Mensuration. Log rules. Scaling of logs in board feet. Cord measure. Amount of timber required to make 1000 shingles. Shingle bolts, and units of measures used by all by-products. Piling specifications and values compared with other products. Making of volume tables and form factor tables for timber estimating purposes. Growth studies. Volume growth percent. Yield tables. Complete valuation surveys including application of methods learned in connection with forest appraisals in course 304 and 305 to areas of timber land. Comparison between values derived in logging and mill cuts and estimates of standing timber. Field work at the mills and in the woods. Each student is required to assist in making a complete valuation survey and in preparing a complete report on a given piece of timber. Advanced work in the execution of topographic surveys on timbered areas. Costs of such work.

Prerequisites: For. 304 and 305, C. E. 234 and 235. General Forestry and Logging Engineering; junior year; first semester; 5 credits; 3 recitations; 2 field periods of three hours each. Reference text: Graves, Forest Mensuration. Fee \$2.00.

303. Forest Mapping. Drill in the detail of Forest mapping. Forest Service plain lettering and conventional signs. Use of contour and road pens, ruling pen, cross section liner, pantograph, and lettering gauges. Crayon and ink coloring in Forest Service and other standard legend. Making of final reconnaissance and land classification maps.

Forestry; elective; freshman year, second semester; sophomore year, first semester; 2 credits; two laboratory periods. Fee \$2.00.

304. Elementary Mensuration. Use of instruments employed in cruising timber; aneroid and barograph, box compass, jacob staff compass, Locke hand level, Abney hand level, Forest Service topographic hand level, trail tapes, etc. Cavalry sketching board. Principles and practice of pacing. Standardizing pace to all kinds of ground. Methods of covering ground in making timber appraisals, both in Forest Service and commercial timber holdings. History and theory of surveying public lands. Federal rectangular survey system. Private land grant boundary. Donation land claims. This last to be confined to a foundation on which the field work will be built. British Columbia land laws and methods of surveys. Mexican land grants. South American land laws and grants.

General Forestry and Logging Engineering; second semester; 3 credits; 2 recitations; 1 three-hours field period. Text: U. S. Manual of Public Land Surveys. Fee \$2.00.

305. Mensuration. The use of Forest Service and other hypsometers, Biltmore stick, Forest Service cruisers' sticks, calipers, diameter tape. Methods of estimating and measuring heights and diameters of trees without special instruments. Topographic surveying of forested areas. Keeping field notes. Approved methods of traversing. Practice in surveying with aneroid barometer with the use of barograph as a checking instrument. Combination of methods. Execution of public land surveys. Retracing surveyed lines. Section subdivisions. Re-establishing obliterated corners. British Columbia, Mexican and South American surveys. Photographic surveys. Costs.

Prerequisites: For. 304 and C. E. 234. General Forestry and Logging Engineering; sophomore year; first semester; 3 credits; 1 recitation; 2 three-hours field or laboratory periods. Fee \$2.00.

306. Forest Appraisals and Reports. Commercial timber land examinations as made by commercial cruising companies. Cruising

methods required by bonding companies, bankers, purchasers and operators. Preparation of the report which should cover such examinations. The various cruising methods and their relative merits. In this course the student will be required to work out and report on a problem which will be of practical value to some logging concern.

Prerequisite: For. 301. Logging Engineering; senior year; first semester; 3 credits; 2 lectures; 1 field or laboratory period of three hours. Fee \$3.00.

307. Log Scaling. Log Scaling as practiced in the United States generally and in the Pacific Northwest and in British Columbia in particular. The theory of board measure and the merits and demerits of the different scale rules. Allowances for log defect. The keeping of records. Scaling with reference to log grades as practiced on the Pacific Coast in different kinds of timber. Rules governing the sale of logs in different districts. Rules of log scaling and grading bureaus. Students will be required to scale at mills and logging camps. Laws governing scaling.

Prerequisites: Forestry 304 and 305. General Forestry and Logging Engineering; junior year; second semester; 2 credits; 1 lecture; 1 field period of three hours. Fee \$1.50.

308. Topographic Logging Plans. Plans for logging operations. Students will be required to make a topographic map of a timbered area. The timber will be cruised and a complete set of plans worked out, showing the proper location of the main line logging railroads, railroad spurs, rollways or landings, pole roads, swing settings, logging area lines. An estimate will be made of the cost of logging the tract.

Prerequisites: For. 301 and C. E. 235. Logging Engineering; graduate year; first semester; 4 credits; 2 recitations; 2 field periods of three hours each. Fee \$4.00.

313. Efficiency Systems. General discussions of efficiency systems. Special application to the lumber industry. Cost-keeping systems and their comparative values. Organization. Cost keeping versus bookkeeping. Bonus, merit, profit-sharing and piece systems. Labor problems as applied to the logging industry. Present day labor management as practiced in modern logging operations.

Logging Engineering; senior year; second semester; 2 credits; 2 lectures.

315. Logging Methods. The yarding, skidding and loading of logs by all known methods. Falling and bucking of timber. The relative merits of various methods will be considered. All known methods of handling timber from the standing tree to the mill will be discussed, not only with regard to Northwestern methods but methods used all over the United States and Canada.

Logging Engineering; graduate year; second semester; 2 credits; 2 lectures.

316. Logging Machine Design. Designing logging equipment, tools and rigging. Instruction in the preparation of working plans for machine shop and foundry construction. Students will make a set of drawings of standard woods tools and railroad equipment which are constructed in mill and camp shops.

Prerequisite: For. 317. Logging Engineering; junior year; second semester; 2 credits; 2 laboratory periods of three hours each. Fee \$2.00.

317. Advanced Forest Mapping. A course in the method and construction of relief maps made from topographical data obtained by each student in the field; a study of their use in planning logging operations and value of the same for such purposes. Costs of constructing relief maps. Free hand field sketching. Drill in lettering and finishing maps.

Prerequisites: For. 301 and 303. Logging Engineering; junior year; first semester; 2 credits; 1 laboratory and 1 field period of three hours each. Fee \$2.00.

318. Advanced Forest Mapping. A continuation of course 317.

Logging Engineering; junior year; second semester; two credits; 1 laboratory and 1 field period. Fee \$2.00.

401. Forest Finance. Investments and costs in forest production. The value of forest property for destructive lumbering. Value of forest property for continued timber production. Appraisal of damages due to the destruction of forest property. Forest taxation. Stumpage values. Comparison of forest values with agricultural values.

Forestry; senior year; first semester; 4 credits; 4 lectures and recitations. Reference text: Chapman, Forest Valuation.

403. Economics of the Lumber Industry. A brief history of lumbering in the United States. Stumpage prices. Prices of manufactured lumber. Shifting centers of production. Transportation.

Freight rates. The Inter-State Commerce Commission and the lumber industry. Substitutes and their effects. Lumbermen's Associations. Present rate of consumption and the future supply. Function of the government in the future of the industry.

General Forestry and Logging Engineering; senior year; first semester; four credits; four lectures.

405. Forest Improvements. A study of the planning, construction, and maintenance of the permanent improvements essential to the protection, administration, and use of a forest. Also the keeping of cost data for future estimating and supervision. Transportation improvements: roads, trails, bridges, and signposts. Communication improvements: telephones, heliographs, wireless. Protective improvements: lookout stations; fire lines, tool caches. Quarters improvements: houses, cabins, barns, sheds, fences, water supply, drainage systems.

Forestry; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

406. Field Work. This course is based upon practical work performed by the student between the sophomore and junior years or between the junior and senior years. The work must be done on some modern logging operation or in connection with some technical forestry work carried on by the State or by the Forest Service. A report based upon an approved outline must be submitted.

Forestry; junior or senior year; from 1 to 5 credits.

407. Lumbering Management. A series of lectures dealing with the lumber industry from the manager's standpoint. Trade, selling grades, and utility will be considered. Major accounting of interest to the manager. Lumber associations, bonds, taxation. Lumber rates and tariffs. Rate zones, control by Inter-State Commerce Commission. Rates by rail and water. Low towage.

Logging Engineering; graduate year; second semester; four credits; 4 lectures.

408. Seminar. Preparation and discussion of reports of special subjects. Current forestry and lumbering literature. Each student is required to prepare a report on some assigned subject.

Forestry; senior year; first semester; 1 credit.

409. Seminar. Continuation of course 408.

Forestry; senior year; second semester; 1 credit.

411. Commercial Lectures. A series of lectures by men engaged in the various phases of the lumber industry.

Forestry; elective; junior and senior years; second semester; 1 credit; 1 lecture period.

501. Dendrology. Classification and identification of forest trees, including a study of forest ecology and taxonomy. The silvical characteristics of commercial species. Life-history and requirements of trees.

Forestry; senior year; first semester; 5 credits; 3 recitations; 2 laboratory periods. Reference texts: Sudworth, Trees of the Pacific Slope. Sargent, Trees of North America. Fee \$2.00.

502. Timber Technology. Fundamental principles underlying the seasoning and kiln drying of woods. Kiln drying methods and their relative merits. Preservative treatment of timber, methods and results. Manufacture of wood pulp. Production of fiber products. Manufacture of alcohol, turpentine, resin, tar and other chemical products from wood. Closer utilization of wood waste. Grading rules for the various kinds of manufactured wood products.

General Forestry and Logging Engineering; senior year; second semester; 4 credits; 2 lectures; 2 laboratory periods. Fee \$3.00.

503. Advanced Dendrology. A continuation of course 501.

Forestry; senior year; elective; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.50.

505. Forest Protection. Protecting the forests from fire, insects and fungi. The course deals primarily with protection from fire, laying emphasis on preventive methods such as sentiment making; laws, both state and federal; patrol; and the reduction of risk by slash disposal; fire lines; grazing, etc. Planning an adequate fire fighting system in all its scientific phases. The business of fire fighting, including discovery, communication, transportation to fire, equipment, organization and work done. Federal, state, and private fire-control organizations.

Forestry; sophomore year; second semester; 3 credits; 3 recitations. Fee \$1.00.

506. Commercial Woods. The course is designed primarily to meet the requirements of the woodworker in choosing the species of wood best adapted to his needs, and in identifying the wood commonly used. Macroscopic and microscopic identification of different species. Dendrology and its significance in wood technology. Taxonomy, showing how trees are classed.

Industrial Arts; junior year; first semester; 2 credits; 1 lecture; 1 laboratory or field period. Reference texts: Noyes, Wood and Forest. Kellogg, Lumber and Its Uses. Fee \$2.00.

507. Uses of Wood. Study of wood structure and the adaptation of the wood to commercial uses. The chief wood-using industries and the relative amounts of the principal commercial species used annually. Adaptation of wood to special purposes. The substitutes for wood. Minor uses of wood such as pulp, fiber board, etc. By-products.

General Forestry and Logging Engineering; junior year; first semester; 2 credits; 1 lecture; 1 laboratory period. Reference text: Kellogg, Lumber and Its Uses. Fee \$2.00.

508. Identification of Wood. Identification of all the important commercial woods. Special emphasis is placed on the woods of the Pacific Northwest. Physical and structural properties. All woods in the vicinity of the School are collected during field trips and later prepared in the laboratory for microscopic examination. At the conclusion of the course a key to the identification of these woods is required.

Logging Engineering; junior year; second semester; 2 credits; 1 lecture; 1 field or laboratory period. Reference text: Record, Economic Woods. Fee \$2.00.

601. Logging Railroads. Railroads especially adapted to logging operations. Difference between logging railroads and common carrier railroads. Grades. Alignment. Railroad operation as applied to the logging railroads. Economic theory of location and construction. Structures and materials used in logging railroads. Costs of surveys, construction, operation and maintenance.

Prerequisite: C. E. 274. Logging Engineering; graduate year; first semester; 4 credits; 2 lectures; 1 field and 1 laboratory period of 3 hours each. Reference text: Welbroughton, Economic Theory of Railway Location. Fee \$4.00.

602. Lumber Manufacture. Discussion of the various types of modern mills. Manufacture of secondary products. Electrical versus steam mills. Lumber handling devices. Examinations of up-to-date mills and reports on them will be made.

Logging Engineering; graduate year; first semester; 2 credits; 1 lecture; 1 laboratory period.

604. Logging Devices and Equipment. Flume and chute construction. Rigging. Types of railroad locomotives, logging cars

and trucks. Donkey engines. Skidding and loading devices. Camp buildings, shops, dwellings. Machine shop machinery and tools. Woods tools. Railroad track equipment and fixtures. Oil, grease, packing and waste. Water supply systems. Explosives. Construction equipment. Boilers, aerial tramways, snubbing devices. Incline railroads.

Logging Engineering; graduate year; first semester; 4 credits; 2 lectures; 2 laboratory periods of three hours each. Fee \$4.00.

605. Logging Devices and Equipment. A continuation of course 604. Blocks and hooks, log flumes, wire rope, logging dams, electrical machines used in logging. Detailed investigation of costs and makes of equipment. Aerial and high lead systems. Economic value of using efficient equipment.

Logging Engineering; graduate year; second semester; 4 credits; 2 lectures; 2 laboratory periods of three hours each. Fee \$4.00.

606. Advanced Logging Railroads. A continuation of course 601. Bridge and tunnel construction. Economics of construction and railroad operation. Economics of railroad motive power, rolling stock and other materials. Railroad management and financing.

Prerequisite: For. 601. Logging Engineering; graduate year; second semester; 4 credits; 3 lectures; 1 laboratory period. Fee \$4.00.

SHORT COURSE SUBJECTS IN GENERAL FORESTRY

A. Forest Protection. Causes of forest fires. The methods of controlling forest fires. The proper organization of fire patrol over definite areas. Fire fighting devices. Lookout stations, telephone lines, roads and trails, with reference to fire control. Different methods applicable to different regions.

Forester's Short Course; first semester; 3 credits; 3 recitations.

B. Forest Protection. A continuation of course A.

Forester's Short Course; second semester; 3 credits; 3 recitations.

C. Forest Measurements. The fundamental principles involved in computing the solid contents of logs and trees. Method of construction scale rules. Height measures. Forest Service methods of cruising timber. Other methods. Discounts for defects. Volume tables. Practical demonstrations in the woods.

Forester's Short Course; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

D. Forest Measurements. A continuation of course C.

Forester's Short Course; second semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

E. Forest Surveying and Mapping. A study of the United States system of land surveys. Retracing surveyed lines. Methods employed in marking surveyed lines. The use of the compass; the surveyor's chain; plane table, Abney hand level. Practical field work in surveying. The use of the aneroid barometer in topographic surveying. The details of map making. Conventional signs used in mapping.

Forester's Short Course; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

F. Forest Surveying and Mapping. A continuation of course E.

Forester's Short Course; second semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

G. Forest Improvements. The construction of roads, trails, telephone lines, lookout stations, bridges, cabins, etc., costs.

Forester's Short Course; first semester; 3 credits; 2 recitations; 1 laboratory period.

H. Forest Improvements. A continuation of course G.

Forestry Short Course; second semester; 3 credits; 2 recitations; 1 laboratory period.

K. Forest Administration. The organization of the Federal Forest Service. The District Office. The National Forest. The State Forester's office. Organization of the State work. Forms used in the transaction of forest business. The preparation of reports.

Forester's Short Course; first semester; 1 credit; 1 recitation.

L. Forest Administration. A continuation of course K.

SCHOOL OF HOME ECONOMICS

EXECUTIVE COMMITTEE

MARY ELIZA FAWCETT, Dean of Women, Chairman
HELEN BRYCE BROOKS, Professor of Domestic Art
AVA BERTHA MILAM, Professor of Domestic Science

The School of Home Economics offers the following courses of study: a graduate course leading to the degree of Master of Science, with majors in the departments of Domestic Science and Domestic Art in such special fields as House Administration; Institutional Management, including dietetics; Applied Design; and Education; two four-years courses, each of which leads to the degree of Bachelor of Science; a two-years course for dietitians; a one-year vocational course; a four-weeks course in food preparation, dressmaking, textiles, etc., which is offered in connection with the Winter Short Course; a six-weeks course for teachers, offered in connection with the work of the Summer School, and a course of twelve weeks for women of mature years.

Fundamentally, the young women in the School of Home Economics are offered such training as will help them to be prepared to adjust themselves readily to their environment. Since the relation of women to the economic world has undergone great changes during the last one or two decades, it follows that the education of young women must be such that it will prepare them to be efficient and serviceable to their community.

That the young women completing this course may be good citizens as well as good housekeepers; good business managers in their homes, as well as good cooks; broadly educated women, as well as specially trained workers, the courses of study in the School of Home Economics have been planned to give a liberal as well as a technical education.

Many opportunities are open for the woman capable of solving the problems of good food service for large numbers of people, and for experts in the management of large institutions. Equally attractive opportunities are available for the expert needlewoman, the tasteful designer of gowns, the competent dressmaker or milliner, the ladies' tailor, and the woman with artistic resources as a household decorator and furnisher. Opportunities for teaching Home Economics, not only in the high schools and colleges, but as supervisors in the common schools of cities, and in the consolidated community schools of progressive rural communities, are becoming

more general and more desirable. Facilities for specializing in this work at the College are therefore given special attention.

More and more the life of the modern community is dependent upon institutions. Women are rapidly taking their places as executive and administrative leaders in the important functions of these institutions. Hospitals, Institutional Homes, Asylums, Educational Institutions, and Social Centers, are increasingly demanding the service of the women of skilled technical accomplishments. There is a growing demand for dietitians in the hospitals and large institutions. The training in dietetics, catering, and business management offered the young women at the College through the School of Home Economics, assists in the liberal and practical preparation for this employment.

With the establishment of the College Practice House, Household Administration is being more effectively taught than was formerly possible without this equipment. (See description under Course 530, Domestic Science.)

Quartered in a new building, provided with a thoroughly practical modern heating, ventilating, and sanitary system, and equipped with the most approved facilities for conducting the work of the various departments, the School of Home Economics is in a very fortunate position for making its courses of the utmost value to its patrons — not only to its resident students, but to the communities of the State at large wherever its extension activities may penetrate.

REQUIREMENTS FOR GRADUATION IN THE SCHOOL OF HOME ECONOMICS

In order to secure the degree in Home Economics a minimum of 132 college credits must be completed. The subjects required in the Freshman and Sophomore years are prescribed. The subjects for the Junior and Senior years may be selected from the following groups:

Group I Degree Course

General group at least 13 credits.

Science group at least 6 credits.

Home Economics group at least 22 credits.

Free electives 22 credits.

Group II Degree Course

General group at least 18 credits.

Science group at least 6 credits.

Home Economics group at least 12 credits.

Free electives 27 credits.

DEGREE COURSES IN HOME ECONOMICS

Candidates for the degree of Bachelor of Science in Home Economics will pursue one of two prescribed group courses for the first two years. The freshman and sophomore years of both courses are similar; but at the beginning of the junior year the courses begin to differentiate in the direction of the aim of each course. The junior and senior years allow liberal electives from the several groups of studies in Home Economics, a minimum number from each group being prescribed, besides a free choice varying from 22 to 27 credits from any school or department in College.

Group I comprises courses that offer to women the opportunity to prepare themselves to become teachers of Domestic Science and Domestic Art, or to become Dietitians, or Institutional Managers. The first two years, as prescribed, give the necessary foundation for any one of these occupations; the junior and senior years are elective by groups, a fact which provides for intensive specialization in any one of these departments.

	Semester	
	1st	2nd
Freshman Year		
General Chemistry, (Chem. 102, 103).....	3	3
Hand Sewing, Garment Making, (D. A. 101, 102).....	3	3
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32).....	3	3
Principles of Botany, (Bot. 22, 23).....	2	2
Modern Language	3	3
Library Practice, (Lib. 1).....		½
Hygiene, (Phys. Ed. 10).....	½	
Gymnasium, (Phys. Ed. 5, 6).....	1	1
	17½	17½
Sophomore Year		
Organic Chemistry; Chemistry of Foods (Chem. 200, 402)	4	4
Foods and Cookery, (D. S. 106, 107).....	4	4
Design and Color, (Art 204).....	2	
Household Physics, (Phys. 133, 134).....	2	2
Household Bacteriology, (Bact. 300).....		3
Modern Language	3	3
Gymnasium, (Phys. Ed. 7, 8).....	1	1
	16	17

The work of the junior and senior years may be elected from the groups below with the restrictions indicated at the head of each group.

General Group

A minimum of 13 credits must be chosen from this group selected from departments such as:

English, at least 6 credits.

Economics

Political Science } at least 7 credits

Sociology

Psychology at least 3 credits

History

Language

Mathematics

Art.

Science Group

Zoology

Chemistry

Botany

Bacteriology

Physics

Home Economics Group

A minimum of 22 credits must be chosen from this group.

	Semester	
(a) Domestic Science	1st	2nd
Dietetics, (D. S. 201).....	4	
* Dietetics, (Invalid Cookery) (D. S. 202).....		2
House Sanitation, (D. S. 301).....	2	
Housewifery, (D. S. 510).....		2
House Administration, (D. S. 501).....		3
Home Nursing, (D. S. 511).....	3	either semester
Practice Housekeeping, (D. S. 530).....	3	either semester
(b) Domestic Art		
Advanced Dressmaking, (D. A. 203, 204).....	3	3
Advanced Textiles, (D. A. 601).....		2
Costume Design, (D. A. 701).....	2	
Dressmaking, (D. A. 201, 202).....	3	3
Millinery, (D. A. 301).....		2
House Construction, Decoration and Furnishing, (D. A. 501)	3	

* Juniors 1917-18 must elect Foods and Cookery, (D. S. 107); 4 credits.

	Semester	
	1st	2nd
(c) House Administration		
Dietetics, (D. S. 201).....	4	
Dietetics, (Invalid Cookery) (D. S. 202).....		2
House Sanitation, (D. S. 301).....	2	
Housewifery, (D. S. 510).....		2
House Administration, (D. S. 501).....		3
House Construction, Decoration and Furnishing, (D. A. 501)	3	
Foods and Cookery, (D. S. 107).....	4	or 4
Advanced Textiles, (D. A. 601).....		2
Dressmaking, (D. A. 201, 202).....	3	3
Home Nursing, (D. S. 511).....	3 credits either semester	

(d) Institutional Management

Dietetics, (D. S. 201).....	4	
Dietetics, (Invalid Cookery) (D. S. 202).....		2
Institutional Management, (D. S. 504).....	3	
Catering, (D. S. 210).....		2
Foods and Cookery, (D. S. 107).....	4	or 4

(e) Applied Design

Basketry, (D. A. 402).....	2	
Hand Work and Weaving, (D. A. 405).....		2
Design, (Art 205 or 305 or 306).....	2	
Clay Modeling, (Art 413, 414).....	2	2
Metal Work (Art 600, 601).....	2	2

Industrial Education Group

General Psychology, (Ind. Ed. 101).....	3 either semester
Educational Psychology, (Ind. Ed. 102).....	2 either semester
Principles of Education, (Ind. Ed. 131).....	3 either semester
Special Methods in Home Economics, (Ind. Ed. 160)	3 either semester
Special Methods in Domestic Art, (Ind. Ed. 164.)	2 either semester
Special Methods in Domestic Science, (Ind. Ed. 165)	2 either semester

Industrial Education 160 is prerequisite to Industrial Education 164 and 165.

Psychology, (Ind. Ed. 101) and Principles of Education, (Ind. Ed. 131) are open to juniors, Industrial Education 160 is open to juniors in the second semester.

Free Electives

An aggregate of 22 credits may be free electives. These may be chosen from any school or department in College, such as Agriculture, Forestry, Commerce, Pharmacy, etc., provided the prerequisites are met.

Group II comprises courses that offer to women the opportunity to prepare themselves in Domestic Science and Domestic Art primarily for the home, and at the same time afford them abundant opportunity, by the freedom of election in the junior and senior years, for the gratification of individual inclination through a study of Art, English, Modern Languages, the Sciences, Horticulture, including Floriculture and Landscape Gardening, Pharmacy, Mines, Physical Education, etc. Group II does not prepare students for positions as teachers or dietitians.

Freshman Year	Semester	
	1st	2nd
Elementary Household Chemistry, (Chem. 12, 13).....	3	3
Hand Sewing, Garment Making, (D. A. 101, 102).....	3	3
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32).....	3	3
Principles of Botany, (Bot. 22, 23).....	2	2
Modern Language	3	3
Library Practice, (Lib. 1).....		½
Hygiene, (Phys. Ed. 10).....	½	
Gymnasium, (Phys. Ed. 5, 6).....	1	1
	<hr/> 17½	<hr/> 17½

Sophomore Year

General Science, including Physiology, Bacteriology, Physics	4	4
Foods and Cookery, (D. S. 106, 107).....	4	4
Design and Color, (Art 204).....		2
English	3	3
Modern Language	3	3
Household Accounting (Com. 120).....	1	
Gymnasium (Phys. Ed. 7, 8).....	1	1
	<hr/> 16	<hr/> 17

The work of the junior and senior years may be elected from the groups below with the restrictions indicated at the head of each group.

General Group

A minimum of 18 credits must be chosen from this group selected from departments such as:

Economics	}	at least 7 credits
Political Science		
Sociology		
Psychology, at least 3 credits.		
English, at least 6 credits.		
History		
Language		
Mathematics		
Art		

Science Group

A minimum of 6 credits must be chosen from this group selected from departments such as:

Physiology. Physiology 207 prerequisite for dietetics.
 Zoology
 Chemistry
 Botany
 Bacteriology
 Physics

Home Economics Group

A minimum of 12 credits must be chosen from this group.

(a) Domestic Science	Semester	
	1st	2nd
* Dietetics, (D. S. 203).....	4	
Foods and Cookery, (D. S. 107).....	4	or 4
House Sanitation, (D. S. 301).....	2	
Housewifery, (D. S. 510).....		2
House Administration, (D. S. 501).....		3
Home Nursing, (D. S. 511).....	3 credits either semester	
Practice Housekeeping, (D. S. 530).....	3 credits either semester	

* Juniors 1917-18 elect D. S. 107.

	Semester	
	1st	2nd
(b) Domestic Art		
Advanced Dressmaking, (D. A. 203, 204).....	3	3
Advanced Textiles, (D. A. 601).....		2
Costume Design, (D. A. 701).....	2	
Dressmaking, (D. A. 201, 202).....	3	3
Millinery, (D. A. 301).....		2
House Construction, Decoration and Furnishing, (D. A. 501)	3	
(c) House Administration		
Dietetics, (D. S. 203).....	4	
House Sanitation, (D. S. 301).....	2	
Housewifery, (D. S. 510).....		2
House Administration, (D. S. 501).....		3
House Construction, Decoration and Furnishing, (D. A. 501)	3	
Foods and Cookery, (D. S. 107).....	4	or 4
Advanced Textiles, (D. A. 601).....		2
Dressmaking, D. A. 201, 202).....	3	3
Home Nursing, (D. S. 511).....	3 credits either semester	
Practice Housekeeping, (D. S. 530).....	3 credits either semester	
(d) Institutional Management		
Dietetics, (D. S. 203).....	4	
Institutional Management, (D. S. 504).....	3	
Catering, (D. S. 210).....		2
Foods and Cookery, (D. S. 107).....	4	or 4
(e) Applied Design		
Basketry, (D. A. 402).....	2	
Hand Work and Weaving, (D. A. 405).....		2
Design, (Art 305).....	2	
Clay Modeling, (Art 413, 414).....	2	2
Metal Work, (Art 600, 601).....	2	2

Free Electives

An aggregate of 27 credits may be free electives. These may be chosen from any school or department in College, such as Agriculture, Forestry, Commerce, Pharmacy, etc., provided the prerequisites are met.

DIETITIANS' COURSE

The course outlined below is intended for young women who desire competent training to fit themselves to become dietitians in hospitals, institutions under State, county, charity, or private management where large numbers of people are housed and fed, or dietitians under military or Red Cross auspices. Students matriculating for this course must be at least twenty-one years of age, and graduates of a four-years high-school course of study or its equivalent. To secure a dietitian's certificate, sixty-eight credits are required, including three months of practical field work.

	Semester	
	1st	2nd
First Year		
Household Chemistry, (Chem. 12, 13).....	3	3
College Rhetoric, (Eng. 31, 32).....	3	3
Physiology, (Zool. 207, 208).....	3	3
Home Economics Bacteriology, (Bact. 304).....		3
Foods and Cookery, (D. S. H, I).....	5	5
Sanitation and Care of the Home, (D. S. K).....	2	
	16	17
Second Year		
Nutritional Physiology, (Zool. 205).....	3	
Dietetics, (D. S. 203).....	4	
Dietetics, (D. S. 202).....		2
Home Nursing, (D. S. 511).....	3	
House Administration, (D. S. 501).....		3
Institutional Management, (D. S. 504).....		3
English	3	3
Psychology, (Ind. Ed. 101).....		3
Home Economics Bacteriology, (Bact. 305).....	3	
Elective		2
	16	16

Field Work, to be arranged, 3 credits.

VOCATIONAL COURSES

The one-year Vocational course, established 1914, is provided especially for those women whose schooling may not qualify them to enter the degree courses, whose duties demand that they shall content themselves with a brief period of training for their life work, or whose aim in seeking training at the College is exclusively practical. The purpose of the other short courses in Home Economics is quite similar to this—to provide, in the short time assigned to the particular courses, the fullest and most fruitful training that is possible to offer with the facilities of a thoroughly modern School of Home Economics, and to present this training in such a way that it shall be most immediately and constructively helpful to the particular patrons of the given course. Only the one-year vocational course and the regular degree courses are outlined here, the others being presented in the usual special bulletins issued for the Winter Short Course and the Summer School.

Admission to any of the vocational courses demands an educational qualification not greater than an eighth grade or common school course; and in the instance of mature persons, otherwise capable of carrying on the work, even this qualification may be waived.

Vocational Course	Semester	
	1st	2nd
Foods and Cookery (D. S. H and I).....	5	5
Care of Children (D. S. J).....		1
Hand Sewing and Garment Making, Dressmaking (D. A. K and L).....	4	4
Sanitation and Care of the Home (D. S. K).....	2	
Elementary Physiology (Zool. A).....	2	
Preventive Medicine (Bact. B).....	1	
Home Nursing and Invalid Cookery (D. S. M).....		2
House Furnishing (D. A. N).....		2
Hygiene (Phys. Ed. 10).....	½	
Gymnasium (Phys. Ed. 1, 2).....	1	1
	<hr/> 15½	<hr/> 15

DOMESTIC ART

HELEN BRYCE BROOKS, Professor
GRACE GILLETT, Instructor
BARBARA MOORE, Instructor
CORA ELIZABETH PLATT, Instructor
HELEN PEER, Instructor
JUNE SEELEY, Instructor
LOUISE ALBERTA SCHNEIDER, Instructor
MARGARET MOREHOUSE, Instructor

The following courses are offered:

101. Sewing. The fundamental principles of hand and machine sewing applied to household linens and undergarments. Darning, patching, and care of clothing are considered.

The study of the development of the textile industries will give a deep appreciation for fabrics, and the responsibility for thoughtful purchasing.

Freshman year; first semester; 3 credits; 1 recitation; 3 laboratory periods. Fee \$1.00.

102. Garment Making. Continuation of course 101 in which the making of cotton dresses will be presented. Simple embroidery stitches will be taught where such are applicable. The study of cotton will give an added value to the garments being made.

Prerequisite: Domestic Art 101. Freshman year; second semester; 3 credits; 1 recitation; 3 laboratory periods. Fee \$1.00.

201. Dressmaking. The fundamental principles of dressmaking; the draughting, making, and adjusting of patterns to measurements; the making of shirt waists, tailored skirts, and a simple wool dress. The textile work will be a study of wool.

Prerequisites: Domestic Art 101, 102; Art 102, 103. Junior year; first semester; 3 credits; 1 recitation; 3 laboratory periods. Fee \$1.00.

202. Dressmaking. Continuation of course 201. The textile work will be a study of silk and linen.

Prerequisite: Domestic Art 201; Art 204. Elective; 3 credits; 1 recitation; 3 laboratory periods. Fee \$1.00.

203. Tailoring. This course has for its problem the making of a cloth jacket suit. Careful draughting of the patterns and excellence of construction and finish will be required.

Prerequisites: Domestic Art 202, 203. Elective; second semester; 3 credits; 1 recitation; 3 laboratory periods. Fee \$0.50.

204. Advanced Dressmaking. Modeling and making of elaborate gowns. Emphasis on color combinations, technique, suit-

ability of design for material used, and for purposes intended.

Prerequisites: Domestic Art 202, 701. Elective; first semester; 3 credits; 1 recitation; 3 laboratory periods. Fee \$1.00.

301. Millinery. Designing and constructing buckram and wire frames. Making and placing of trimmings, renovation of materials, straw sewing, bow making, and the construction of a hat from foundation to completion.

Elective; second semester; 2 credits; 2 laboratory periods. Fee \$1.50.

401. Basketry. A form of decorative art which involves careful consideration of form, color, and design; these principles will be considered in the making of rugs, reed baskets, stools, and raffia baskets.

Elective; first semester; 2 credits; 3 laboratory periods. Fee \$4.00.

404. Handwork and Weaving. The study of advanced handwork, knitting, weaving, embroidery stitches and design as applied to costume, embroidery, and decorative design for household purposes.

Elective; second semester; 2 credits; 3 laboratory periods. Fee \$3.00.

501. House Construction and Decoration. Two lectures and two laboratory periods each week to the study of house construction and furnishings. The laboratory hours are devoted to the making of plans for medium-sized residences; the best utilization of space, the most economical placing of equipment, and the decoration and furnishing of a house in the most economical, sanitary, and artistic manner. The lectures relate to the development of house building and reasons for the selections. All phases of house furnishing will be studied—floor coverings, furniture, linens needed, curtain hangings, china, silver, pictures—in such a manner as to give a full grasp of a problem likely to be met by every student.

Elective; either semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$0.50. Text: Robinson, Domestic Architecture.

502. House Construction and Decoration. Continuation of 501.

Elective; second semester; 2 credits; 1 recitation; 2 laboratory periods. Fee \$0.50.

601. Advanced Textiles. The identification of textile materials, their names, kinds, prices, and widths; variation in weave in regard to beauty and strength; the use and value of cotton, silk, wool, and linen for clothing and household furnishings. The identification of fibers and substitute materials by means of the microscope; the chemical examination of fibers, including tests to determine content of cloth and adulteration; and proper use of materials in relation to cleansing and laundering.

Elective; second semester; 2 credits; 2 recitations; 1 laboratory period. Fee \$1.00.

701. Costume Design. Study of the figure; sketching of garments, hats, and gowns; modeling of patterns; designing and modeling in material; study of design for embroidery and dress decoration.

Elective; first semester; 2 credits; 1 recitation; 2 laboratory periods. Fee \$1.50.

K. Hand Sewing and Garment Making. Lectures relating to textiles, their production and manufacture, given for the purpose of assisting the home maker in her selection and use of the fabrics used in the home. Emphasis upon the care and storage of household linens. The laboratory work is planned to give the student practical experience in the making of all needlework problems that are to be met in the home.

Vocational course; first semester; 4 credits; 2 recitations; 4 laboratory periods. Fee \$0.50.

L. Dressmaking. Follows course K. Lectures relating to the manufacture of cloth, its adulteration, economical purchasing, and use. Laboratory work gives the student experience in the making of wash dresses, childrens' dresses, woolen dresses, and the renovating and making of one woolen dress. Draughting of patterns; the use of commercial patterns.

Vocational course; second semester; 4 credits; 2 lectures; 4 laboratory periods. Fee \$0.50.

N. House Furnishing. A practical course in the decorating and furnishing of the entire house. The problems of the economic and artistic furnishing will be considered. Visits to house-furnishing stores for the purpose of selecting materials will be a feature of this course.

Vocational course; second semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

DOMESTIC SCIENCE

AVA BERTHA MILAM, Professor
ALICE MARKS DOLMAN, Assistant Professor
SARAH LOUISE LEWIS, Assistant Professor
ALMA GRACE JOHNSON, Instructor
BERTHA DAVIS, Instructor
LAURA JEAN CHENEY, Instructor
LILLIAN WILES FRANCIS, Instructor
CHRISTIE MOORE, Instructor
SIBYLLA HADWEN, Instructor
MINNIE KALBUS, Instructor
INEZ BOZORTH, Secretary.

The Department of Domestic Science is located in the new Home Economics building and occupies the basement, first floor, and one-half of the second floor of the completed east wing of this structure. There are four large laboratories, with excellent modern equipment for all types of food preparation. A small laboratory is equipped with various kinds of cooking apparatus and is designed for experimental work. Adjoining the experimental laboratory is a dining room large enough to accommodate twenty people. This is used for meal serving and enables the students to put into actual practice the knowledge gained elsewhere.

With the leasing of a furnished eight-room house in close proximity to the College, a new and significant feature was added to the Home Economics course in September, 1916. In groups of eleven, advanced students are afforded the opportunity of living in the house for six weeks under the supervision of a Domestic Science faculty woman. The problems of housekeeping, including the purchasing, care, and cooking of food, the planning of meals, the care of the house and family laundry, are conducted by the students. The economic side is given particular attention, and the fees paid by the students in this course cover the entire operating expenses of the house.

Equipment has been installed in the cafeteria for the use of classes in Institutional Management.

The following courses are offered:

* 106. **Foods and Cookery.** An introduction to the subject of foods in their scientific and economic aspect, selection, preparation, and use. The process of digestion, absorption, and assimilation.

Prerequisites: General Chemistry 102, 103; Principles of Botany 20, 21; parallel, Organic Chemistry 200, or Household

* These two courses, 4 credits each, take the place of D. S. 101, 102, 104, 105, 3 credits each. Students having completed courses 101 and 102 are to take course 107.

Chemistry and Physiology. Domestic Science; sophomore year; first semester; 4 credits; 2 lectures; 2 three-hours laboratory periods. Fee \$6.00.

* 107. **Foods and Cookery.** A continuation of course 106; canning and preserving of foods, menu making, and table service.

Prerequisites: Food and Cookery 106; parallel, Chemistry of Foods 402. Domestic Science; sophomore year; either semester; 4 credits; 2 lectures; 2 three-hours laboratory periods. Fee \$7.00.

110. **Experimental Cookery.** A study of individual problems. Each student selects some piece of work concerned with foods or related subjects. Oregon products often furnish the material for these experiments. Detailed records and reports demanded.

Prerequisite: D. S. 106, 107. Domestic Science; senior elective; either semester; 2 credits; 2 three-hours laboratory periods. Fee \$2.00.

120. **Methods of Demonstrations.** A course preparing students to give public demonstrations in food selection and preparation. Types of demonstrations, equipment required, organization of plans, general method of procedure, results to be obtained from demonstrations. Illustrative demonstrations by instructor. Student demonstrations.

Prerequisite: D. S. 106, 107. Domestic Science; senior elective; second semester; 1 credit; 1 three-hours laboratory period. Fee \$1.50.

180. **Foods and Cookery.** For women desiring knowledge of home cookery. A study of typical foods and their preparation in attractive forms, with the planning and serving of meals.

One evening lesson a week. A term of twelve lessons. Either semester; hours to be arranged. Fee \$2.50.

190. **Camp Cookery.** Instructions in various ways of combining into palatable and nutritious products such food materials as are available for use in camps, the making of different kinds of breads, as well as mulligans, griddle cakes, and other camp dishes. Practice during the latter part of the course in preparing food out of doors by means of dutch ovens, reflectors, and improvised cooking utensils.

* These two courses, 4 credits each, take the place of D. S. 101, 102, 104, 105, 3 credits each. Students having completed courses 101 and 102 are to take course 107.

Domestic Science elective; junior or senior men in Forestry, Agriculture, Engineering, and Commerce courses; second semester; 1 credit; 1 laboratory period. Fee \$2.50.

191. Cookery for Men. A course for men who are planning and preparing their own meals or who are acting as managers of clubs. The uses of food in the body, factors affecting food requirements, making of menus suited to the needs of individuals under various living conditions. The practical work includes the making of numerous dishes and the serving of well-balanced meals at reasonable cost.

Domestic Science; elective to all men of the College; first semester; 1 credit; 1 three-hours laboratory period. Fee \$2.50.

201. Dietetics. A scientific study of food materials in their relation to the daily dietary of families under various conditions of health and environment; a study of the dietary standards and metabolism. A comparison of the nutritive values of the common foods, made by computing, preparing, and serving dietaries of specific costs, furnishing specific nutrients.

Prerequisites: Domestic Science 106 and 107; Physiology 207. Elective; first semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$4.00. Text: Rose, Laboratory Manual of Dietetics. Farmer: Boston Cooking School Cook Book. Hill: Practical Cooking and Serving. Sherman: Chemistry of Food and Nutrition.

202. Dietetics. Food for the young child. Invalid diets. Disease as affected by foods.

Prerequisite: Home Nursing 511; Dietetics 201, or 203. Domestic Science; senior year; second semester; 2 credits; 1 lecture; 1 laboratory period. Fee \$2.00.

203. Dietetics. A simplified course in dietetics dealing with a study of food materials in their relations to daily dietaries of families under various conditions of health and environment, and a comparison of nutritive values of common foods made by computing, preparing, and serving dietaries of specific costs furnishing specific nutrients.

Prerequisites: Household Chemistry, 6 credits; Domestic Science 106, 107; (or H. and I. for Dietitians and Physiology 207.) Elective; second semester of senior year; 4 credits; 2 recitations; 2 laboratory periods. Fee \$4.00.

210. Catering. Designed for students who are interested in the management of tea rooms and lunch rooms and in catering for

private entertainments. The work includes the purchase, preparation, and service of refreshments at such functions as afternoon teas, luncheons, and small banquets. The students are expected to devote at least six hours a week to the course.

Prerequisite: Domestic Science 106 and 107, or the equivalent, for degree courses. Elective; senior year; either semester; 2 credits; 1 laboratory period of six hours. Fee \$2.00.

301. House Sanitation. The house as a factor in health. Situation, surroundings, ventilation, heating, drainage, plumbing, lighting, and furnishing of the house. Investigation of general sanitary conditions from a practical and scientific standpoint with special reference to the needs of the community, household, and school.

Junior year; either semester; 2 credits; 2 recitations. Text: Talbot, *House Sanitation* (as guide).

501. Household Administration. The organization and control of the home. The economic relations of the household, applying scientific and economic principles to its problems. A study of family income and its equivalent in productive labor within the household. Family expenditures and their regulation. The budget as a measure of standards of living. The domestic service problem and efficiency of the household.

Prerequisite: (for degree students) Economics 211. Domestic Science; senior year; either semester; 3 credits; 3 lectures.

504. Institutional Management. A course in the purchase of food and equipment in large quantities, methods of record keeping, making of menus and the general methods of sanitation and care of buildings wherein many are housed.

Prerequisites: (for degree students) Domestic Science 106 and 107, Economics 211, (for Dietitians H. and I.). Parallel or prerequisite: Household Administration. Senior year; either semester; 3 credits; 3 laboratory periods of three hours each.

510. Housewifery. Efficiency in the care of the home, from the chemical, economic, and practical standpoint. The treatment of floors, walls, and woodwork. The removal of stains. The cleaning of rugs and carpets. Laundering of household linen and clothing. The selection of cleaning apparatus and machinery.

Prerequisites: General Chemistry 100, 101. Domestic Science; junior year; either semester; 2 credits; 1 lecture; 1 three-hour laboratory period. Fee \$0.50. Text: L. Ray Balderston, *Laundering*. E. G. Osman, *Cleaning and Renovating at Home*.

511. Home Nursing. Care of patient under home conditions. Symptoms. First aid to the injured. Management of communicable diseases.

Prerequisites: Physiology 207; Bacteriology 300. Domestic Science; senior year; first semester; 3 credits; 3 lectures. Text: Maxwell and Pope, Practical Nursing.

530. Practice Housekeeping. This course deals with the problems of homemakers. The students put into actual practice and apply to real home conditions the Principles of Cookery, Housewifery, Household Management, and Methods of Laundering studied in their college course. Each girl does every duty concerned in the management of the house during the time she is a resident there. Special attention is given to the economic side of the question. The students carry their regular college work during the time they live in the practice house.

Prerequisites: Domestic Science 104 or its equivalent. Domestic Science 105 is also desirable. Domestic Science elective; junior and senior years; either semester; $\frac{1}{2}$ credit a week. Fee \$5.00 a week living expenses.

550. Modern Problems in Household Administration. The topics assigned for research will be chemical, physiological, bacteriological, economical, or sociological, according to the preferences and training of the individual students.

Graduate year; first semester; credits to be arranged.

551. Modern Problems in Household Administration. A continuation of the research work commenced in course 550.

Graduate year; second semester; credits to be arranged.

701. Special Research in Cookery. In assigning research problems for graduate students, both the previous training and the student's preferences are considered. Assignment of problems to be worked upon during the year is made by the professor in charge.

Graduate year; first semester; credits to be arranged.

702. Special Research in Cookery. Continuation of research work commenced in course 701.

Graduate year; second semester; credits to be arranged.

H. Foods and Cookery. The study of foods, source, economical purchase, storage, and cookery. Gives the student a working knowledge of the nutritive value of foods. Offers extended experience in practical cooking, with careful estimation of cost and quantity, special attention being given to preservation of foods.

Vocational course; first semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$6.00.

I. Foods and Cookery. A continuation of course H. This course aims to present the fundamental principles of human nutrition and to teach their application under varying physiological, economic, and social conditions. Special attention given to making of menus and preparation and service of meals.

Vocational course; second semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$6.00.

J. Care of Children. Physical and mental development. Proper feeding and clothing. General care from infancy through adolescence.

Vocational course; second semester; 1 credit; 2 lectures.

K. Sanitation and Care of the Home. Lectures and laboratory hours relating to study of home problems, the choice of site for the house, construction, lighting, heating, plumbing, disposal of waste, and general care of home. The study of modern labor saving devices, the best cleaning agents, care of floors and woodwork, and the common laundry operations. This course is optional with English.

Vocational course; first semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

M. Home Nursing and Invalid Cookery. Observation of symptoms. Administration of food and medicine. Care of the sick under home conditions. Preparation of food for the invalid. Manner of service.

Vocational course; second semester; 2 credits; 2 lectures; 1 laboratory period. Text: Aiken, Home Nurses' Handbook of Practical Nursing. Fee \$2.00.

SCHOOL OF MINES

HENRY MARTIN PARKS, Dean

Four-years courses leading to the degrees Bachelor of Science in Mining Engineering, Ceramics, and Chemical Engineering are offered. The advanced degrees, Mining, Ceramic, and Chemical Engineer, are conferred upon the completion of the requisite amount of graduate work, as prescribed elsewhere in this catalogue.

Instruction is given by means of lectures and textbooks, supplemented by recitations, and by a great deal of work in the laboratories and field. While the more theoretical studies are not neglected, a determined effort is made to emphasize the practical application and value of all the subjects taught. For this reason, nearly fifty per cent of a student's time is spent in laboratory courses.

The School of Mines occupies a new, commodious, three-story and basement building especially designed for housing the lecture rooms and laboratories devoted to mining, metallurgy, ore dressing, geology, ceramic engineering, chemical engineering, and closely allied subjects.

The first two years in all three departments are identical, and are intended to give the student a thorough comprehension of those studies basic to all branches of engineering; namely, Mathematics, Physics, Chemistry, Mechanical Drawing, Plane Surveying, and Shop Work. To these fundamental subjects are added courses in Mineral Industry, Crystallography and Blowpipe Analysis, and Determinative Mineralogy.

In the last two years, the student takes up the technical studies distinctive of the course pursued. This leads to considerable variation in the work of the different departments, as is indicated in the outline of courses. Statics and Dynamics, Strength of Materials, Hydraulics, and Electrical Machinery are required, however, in all of them.

At least two months employment in industrial lines closely allied to the course pursued, is a prerequisite to entrance upon the senior year.

The work in the School of Mines is so broad in nature that it should equip a student for general engineering operations of many kinds, but particular emphasis is placed, naturally, upon preparation for those fields of activity that are concerned with the discov-

ery, mining or quarrying, and preparation for market, of the mineral wealth with which the Northwest is so richly endowed.

Equipment. The new Mines building provides spacious and well-lighted offices, laboratories, and lecture rooms for the work of this department.

The Assaying and Metallurgical laboratory is a cement-floored room 30 feet wide and 60 feet long on the first floor of the building and extends across the entire east end. It is amply lighted by windows on one side and both ends. At the south end of the room are the most modern type of oil and gasoline furnaces for fusion and other fire work. Conveniently arranged nearby are suitable lockers and work tables with the necessary tools, fluxes, etc. The north end of the room is adequately equipped with sinks, ventilating hoods, gas burners, electric hot plates, and other apparatus for carrying on the various operations involved in parting buttons, assaying solutions, making cyanide tests, etc. One corner of the laboratory is partitioned off for a balance room and provided with the most delicate balances for weighing the gold beads. Balances of both the Keller and Ainsworth makes are available. These are mounted on a specially constructed table not connected with the floor, in order to avoid vibration.

The Crushing and Sampling laboratory in the basement is 25 feet by 30 feet. It contains a power-driven sample crusher of the latest design and one of the recently modeled disk grinders, for properly pulverizing samples for assay or other purposes. The usual bucking-board and muller and other hand-grinding devices are also available for student use, together with a Jones sampler and other appliances used in preparing samples. All such work is done in this room, to avoid dust in the other laboratories.

The Ore-Testing laboratory is a room 25 by 30 feet on the first floor of the building. It is equipped with appliances for studying the behavior of ores when subjected to the various operations of jigging, vanner, table, and magnetic concentration.

The Mining Draughting room is furnished with convenient desks and tables and all necessary equipment for the use of mining students.

MINING ENGINEERING

HENRY MARTIN PARKS, Professor
 WILLIAM HAWES COGHILL, Professor
 GEORGE ELWIN STOWELL, Instructor

The course in Mining Engineering is designed to give the student a thorough training in the fundamentals of the science of mining and metallurgy. It is of such a comprehensive character that a graduate finds it of aid in varied employments. He may expect that after having acquired the necessary maturity he will be able to hold a position as an assayer or chemist; a land or deputy mineral surveyor; a draughtsman and designer in an engineering establishment; on the geological staffs of railroads, mining, or exploration companies; in the land classification work of the Government Forest Service; in the Government Geologic or Coast and Geodetic Surveys; on state geological surveys or in any one of many branches of actual mining, milling, and smelting operations.

DEGREE COURSE IN MINING ENGINEERING

	Freshman Year	Semester	
		1st	2nd
College Algebra (Math. 21).....	2		
Trigonometry (Math. 11).....	3		
Elementary Analysis (Math. 31).....			5
General Chemistry (Chem. 105, 106).....	5		5
Mechanical Drawing (C. E. 107).....	3		
The Mineral Industry (Min. 209).....	1		
Descriptive Geometry (M. E. 153).....			3
Mod. Eng. Prose (Eng. 91, 92).....	2		1
Forging and Tool Dressing (Ind. Arts 158).....			2
Drill (Military 1, 2).....	1		1
Gymnasium (Phys. Ed. 15, 16).....		½	½
		17½	17½

	Semester	
Sophomore Year	1st	2nd
Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Phys. 101, 102).....	4	4
Quantitative Analysis (Chem. 401).....	5	
Methods in Gas Analysis (Chem. 417).....		1
Crystallography and Blowpipe Analysis (Geol. 111).....	3	
Determinative Mineralogy (Geol. 112).....		3
Plane Surveying (C. E. 232).....		4
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Hydraulics (I. E. 102).....		3
Electrical Machinery (E. E. 401).....	3	
Fuels and Metallurgy of Iron and Steel (Chem. E. 410).....		2 $\frac{1}{2}$
General Geology (Geol. 135).....	2	
Petrology (Geol. 137).....		3
Fire Assaying (Chem. E. 401).....	4	
Mine Surveying and Mining Land Law (Min. 212).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/> 16	<hr/> 16 $\frac{1}{2}$
Senior Year		
Metallurgical Laboratory (Chem. E. 423).....	2	
Cyanidation of Ores (Chem. E. 421).....	2	
Metallurgy of Lead, Copper (Chem. E. 412).....		2
Mining and Power Equipment (Min. 231).....	3	
Mining Methods (Min. 224).....		3
Mine Economics (Min. 222).....		3
Ore Dressing (Min. 251).....	3	
Flotation (Min. 252).....		3
Economic Geology (Geol. 182).....	3	
Mining Geology (Geol. 181).....		3
General Engineering Laboratory (Exp. E. 210).....		2
Technical English (Eng. 141).....	3	
	<hr/> 16	<hr/> 16

The following courses are offered:

209. The Mineral Industry. An introductory course designed to give to the School of Mines student a general idea of the main features of his profession. Elementary geology occupies the first two months of the semester and is a brief discussion of the subject, the aim being to summarize the various phases that are taken up in detailed courses later. Several lectures on the ceramic industry are given and several devoted to the essentials of mining and metallurgy. This course covers the whole field of the mineral industry. A certain amount of time is spent in the study of the mineral resources of Oregon.

Freshman year; first semester; 1 credit; 2 lectures. Required of students in the School of Mines, but elective to any one interested.

212. Mine Surveying and Mining Land Law. Supplementary to Plane Surveying, taken in the freshman year. Methods used in underground surveying and mine mapping, in locating and patenting claims, and in such geodetic and topographic surveying as a mining engineer is often called upon to do, are studied; facility in the practical application of these methods is imparted by actual work in the field. Considerable attention is given to the solution of the many problems involving surveying which arise in mining operations; and some time is devoted to the study of the laws regulating the location, possession, and operation of mineral deposits in the United States.

Prerequisite: C. E. 201. Junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Deposit \$2.00.

222. Mine Economics. A detailed study of the cost of extracting from mines, under varying conditions, gold, silver, copper, iron, and other metal ores, as well as coal.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering. Senior year; second semester; 3 credits; 4 recitations.

224. Mining Methods. A study of the various methods used in securing the mineral products. The subject includes methods of timbering, methods of mining, pumping, ventilation, transportation, hoisting, mine sampling and reporting, installation of machinery, and surface improvements. Presented largely through lectures and directed reference work.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering. Senior year; second semester; 3 credits; 4 recitations.

231. Mining and Power Equipment. A study of types of haulage systems, hoists, compressors, drills, pumps, explosives, etc. It also involves a discussion of the sources of power, water, hydro-electric, steam, gas, and compressed air, together with their practical application to mining operations. The subject is presented by means of lectures supplemented by use of trade catalogues, text books, and lantern slides.

Senior year; first semester; 3 credits; 4 recitations.

251. Ore Dressing. A study of the principles and the various methods of ore concentration and the mechanical preparation of ores for metallurgical treatment. This includes crushing machinery, screens, stamp mills, classifiers, jigs, vanners, and tables. Processes such as amalgamation, magnetic separation, electrostatic concentration, etc., are also discussed.

Prerequisite: Geol. 112. Junior year; first semester; 3 credits; 3 recitations; 1 laboratory period.

252. Flotation. A continuation of the course in Ore Dressing. The physical and chemical principles involved in flotation are studied in the class room and the adaptability of the various oils and types of machines are investigated in the laboratory.

Prerequisite: Min. 251. Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

299. Practical Work in Mining. Students in the School of Mines are required, before the senior year, to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course being pursued. Evidence of the nature, quality, and sufficiency of the work will be passed upon by the proper department before credit is given. While the minimum requirement is two months, it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. Insight into the technical subjects studied later, also an appreciation of their application to the conditions met in practice on a commercial scale, are thus gained.

GEOLOGY

GEORGE EDWARD GOODSPEED, Assistant Professor
GEORGE ELWIN STOWELL, Instructor

Most of the courses in geology are designed to meet the demands of the departments in the School of Mines. Courses are also offered which are suited to the needs of students in Forestry

and Agriculture. Although no degree is offered, those who desire more advanced work or are inclined toward the geologic side of mining are given the opportunity to take advanced electives in geology.

Equipment. The laboratories for geology are situated on the third floor of the Mines building and comprise a Geologic and Mining Museum, a Mineralogic laboratory and a Petrologic laboratory.

In the Museum are conveniently arranged collection of ores, minerals and rocks from every important mining camp in the State. There are also framed photographs from the various mining regions and a large scale relief map of the State. Besides the collections, there are many specimens of minerals, rocks, and fossils from numerous American localities. Geologic products are shown, such as samples of all the different grades of clay wares and cement goods. The above collections are attractively displayed in twelve glass-top cases and sixty feet of wall case.

The Mineralogic laboratory possesses the following collections:

No. 1, the Mineral Type Collection, consisting of about 1500 characteristic and labeled specimens used by the students for the purpose of study and comparison.

No. 2, an Exhibit Collection of minerals, consisting of large and attractive specimens.

No. 3, a Working Collection of minerals, consisting of about 7000 unlabeled specimens similar to those in the Type Collection.

No. 4, A Crystal Collection, containing about 1000 natural crystal forms.

No. 5, a Crystal Model Collection, consisting of 48 large glass crystal models and about 750 smaller wooden models used by the students in the study of crystallography.

No. 6, a Blowpipe Collection, containing minerals and metals used in blowpiping.

The Petrologic laboratory contains the following collections:

No. 1, the Rock Type Collection, consisting of about 500 characteristic labeled specimens used by the student for the purpose of study.

No. 2, the Working Collection of Rocks, containing about 2000 unlabeled specimens for the use of the students in the work of petrology.

The Petrologic laboratory is also equipped with a polarizing microscope and the following collections for use in the study of petrography:

No. 1. Thirty-six mineral sections for use in petrography.

No. 2. A loaned petrographic collection of over 1200 rock specimens and their respective thin sections.

(For outline of courses containing Geology see the degree course in Mining Engineering.)

The following courses are offered:

111. Crystallography and Blowpipe Analysis. A preparation for the work in Determinative Mineralogy, only those features being emphasized which are essential for the proper understanding and determination of minerals. Instruction is imparted by lectures, textbook, laboratory work, and individual oral quizzes. In the laboratory a student is required to become thoroughly familiar with the crystal models; later he determines the forms on several hundred natural crystals by means of a pocket lens and contact goniometer. Blowpipe Analysis is a rapid and useful method of ascertaining all, or a part, of the elements present in minerals. The course includes practice in the use of the blowpipe and the operations ordinarily included under the term Blowpipe Analysis, experimental work upon known minerals, until facility in the application of the various tests is attained, and the analysis of a score or more of unknown substances.

Prerequisites: Chem. 100 and 101. Sophomore year; first semester; 3 credits; 2 recitations; 3 laboratory periods. Fee \$3.00

112. Determinative Mineralogy. About one hundred and sixty important mineral species, and many varieties of these, are studied. Emphasis is placed upon methods of classification of minerals that involve a knowledge of physical characteristics such as can be gained by visual examination and by the use of the hand lens and pocketknife. Chemical and blowpipe methods are employed only to corroborate the inferences drawn from such observations. The chief end sought is the ready recognition, in the field, of those minerals likely to be encountered in mining operations. Instruction is given by means of lectures, text-book, and laboratory work, and individual oral quizzes. Each student is expected to determine approximately two thousand specimens.

Prerequisite: Geol. 111. Sophomore year; second semester; 3 credits; 2 recitations; 3 laboratory periods. Fee \$3.00.

135. General Geology. A study of the composition, structure, and history of the earth and of the forces instrumental in producing or changing the surface configuration and the crustal formation. Emphasis is given to the chief processes by which the accessible rocks of the earth have been formed and evolved into their present condition. Although designed as a preparation for more special courses, the student will, however, become familiar with the more common rocks and with many of the physical laws that govern the formation of mineral deposits.

Junior year; first semester; 2 credits; 2 lectures; 1 laboratory period, for School of Mines students. Elective in any other course; 3 credits; 2 lectures; 2 laboratory periods. Fee \$1.00.

137. Petrology. A general discussion of the character, mode of occurrence, and origin of rock. Special emphasis is laid upon those phases which are of importance in mining. The course is intended to familiarize the student with the characteristics of the commoner rocks so that he may identify them with reasonable accuracy in the field.

Prerequisites: Geol. 112 and 135. Junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00.

139. Petrography. An advanced course in Petrology. The optical properties of the rock-forming minerals and the characteristics of the principal rock types are studied with the aid of thin sections and polarizing microscope. Type collections with their corresponding rock sections are available, and the student has the opportunity to supplement field determinations with the exact knowledge gained through the use of the microscope. An elective course designed for those who are inclined toward the geologic side of mining and offered only to graduate and advanced students.

Prerequisite: Geol. 137. Elective; first semester; 4 credits; 2 lectures; 3 laboratory periods. Text: Luquer, Minerals in Rock Section.

154. Dynamic and Structural Geology. A detailed study of the geologic forces and agents and their effects. Structural features likely to be encountered in mining operations and the laws governing them are emphasized. Designed for students specializing in the geological side of mining engineering. The lectures are supplemented by numerous problems of a practical nature, special attention being given to the interpretation of geologic maps.

Prerequisites: Geol. 135 and 137. Elective; second semester; 3 credits; 3 recitations.

155. Historical Geology. Lectures on the origin and history of the earth and the plants and animals that have inhabited it. An outline of invertebrate paleontology is presented, and the student is familiarized with the principles on which is based the determination of the age of fossiliferous rocks by means of "faunal groups," and by the recognition of characteristic species. A part of the scheduled recitation periods is utilized for laboratory work.

Prerequisites: Geol. 135 and 137. Elective; first semester; 2 credits; 3 recitations.

156. Geology of the Igneous Rocks. A course designed for graduate or advanced students dealing with the origin of igneous rock bodies. Such subjects as magnetic differentiation, the mechanism of intrusive and extrusive action are discussed in detail and special attention given to those subjects that have an important technical bearing, contact metamorphism, magmatic waters, gaseous emanations, etc.

Prerequisite: Geol. 139. Elective; second semester; 4 credits; 4 recitations. Text: R. A. Daly, *Igneous Rocks and Their Origin*. Harker, *The Natural History of Igneous Rocks*.

161. Forest Geology. The characteristics of the commoner minerals, rocks, and ores. The more important structural features occurring in earth materials and the criteria for recognizing the various types of ore deposits are studied.

Prerequisites: Chem. 100 and 101. Required in Forestry course; optional in all others; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00.

171. Agricultural Geology. The geologic origin and nature of soils. A study is made of the commoner rocks and their alteration by weathering and decay. Lectures are given on the geology of ground waters, and on rock structures which may influence agricultural operations.

Prerequisites: Chem. 100 and 101. Elective in the Agricultural courses; junior or senior year; first semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$1.00.

181. Mining Geology. The principles of ore deposition. Given in the second semester of the senior year in order that all of the student's previous knowledge of geologic subjects may be brought into use in the study of ore deposits, one of the important phases of the education of the prospective mining engineer. Mode of occurrence, origin, geologic relations, and classification of ore

deposits are studied. The various type deposits as known in important mining camps are discussed. The student is required to write abstracts from the literature bearing on the subject. Considerable importance is attached to the accompanying laboratory work, which consists of mineralogic and petrologic study of rocks and ores from type deposits. A certain amount of time is devoted to a discussion of field methods, mine examination, etc.

Prerequisites: Geol. 135, 137, and 182. Senior year; second semester; 3 credits; 3 recitations; 1 laboratory period. Text: Lindgren, Ore Deposits.

182. Economic Geology of the Non-Metallics. A course intended to give to the student a knowledge of the economically important non-metallic substances such as coal, clay, building stone, etc. Geologic occurrence and origin are carefully studied, particularly those characteristics affecting economic value. The student is required to prepare many abstracts from current literature. Considerable time is devoted to individual industries, such as the manufacture of clay products and of Portland cement. Special attention is given to market conditions and the factors affecting them.

Prerequisites: Geol. 135, 137. Senior year; first semester; 3 credits; 3 recitations; 1 laboratory period.

190. Field Work in Geology and Mining. Two weeks of field work given just before the end of the second semester. A not-too-distant mining district is chosen and students are afforded opportunity to do geologic mapping, mine surveying, and to secure some actual mining practice.

Prerequisite: The completed work of the junior year.

199. Practical Geology. Students in the School of Mines are required, before the senior year, to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course being pursued. Evidence of the nature, quality, and sufficiency of this work will be passed upon by the proper department before credit is given. While the minimum requirement is two months, it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. Insight into the technical subjects studied later, also an appreciation of their application to the conditions met in practice on a commercial scale, are thus gained.

CERAMIC ENGINEERING

IRA ABRAHAM WILLIAMS, Professor

The course of instruction in Ceramic Engineering is designed to prepare young men to make intelligent search for suitable raw materials, to test them properly, and to aid in their economic exploitation and development. At the outset, therefore, ceramic students are required to take substantial courses in the basic sciences, chemistry, mathematics, physics, geology, and the preliminary engineering subjects required of other students in the School of Mines.

Work in the subjects distinctive of the course is confined to the last two years, and includes lectures and laboratory instruction and practice in the processes and methods of manufacture of ceramic wares, including, besides the commoner clay products, pottery and porcelain, and the compounding and application of glazes, enamels, cements, etc. Both the materials used and the finished articles will be studied and tested. The physical and chemical principles on which the production and value of ceramic products are based are presented thoroughly, and the student is shown that successful manufacture depends upon a full knowledge and constant application of these principles.

Equipment. The Ceramic Engineering laboratory occupies a room about 30 by 60 feet in the basement of the Mines building. There are also store and supply rooms contiguous to this laboratory. The equipment for the ceramic engineering work consists of a laboratory for ceramic chemistry and apparatus for making physical tests of clays and other ceramic materials; a complete mechanical outfit for the preparation of clays for the manufacture of brick, tile, terra-cotta, etc., and equipment for the compounding of bodies, glazes and enamels for stone- and iron-ware, and all of the higher grade of pottery and of porcelain products. This outfit includes a combination dry-wet-pan, pug mill, blunger, filter press, ball mills and other grinding machines, rolls, screens, potter's wheel, and an auger machine provided with dies for side- and end-cut brick, hollow block, drain tile, and roofing tile; a hand-power screw press with dies for dry press brick and flat tile; and an electric furnace for high temperature work.

In the ceramic engineering laboratory are two kilns, a down-draft burning crude petroleum, and a Caulkins muffle pottery kiln; a steam dryer in which drying conditions can be accurately con-

trolled; an electric and a radiation pyrometer; Seger volumeter; balances and other necessary apparatus.

A ceramic library, which contains the best works in both English and foreign languages, and a ceramic museum are also important features of the working equipment of the department.

DEGREE COURSE IN CERAMIC ENGINEERING

The freshman and sophomore years are identical with the first two years of the Degree Course in Mining Engineering.

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Hydraulics (I. E. 102).....		3
Electrical Machinery (E. E. 402).....		4
General Metallurgy (Chem. E. 411).....	2½	
General Geology (Geol. 135).....	1½	
Petrology (Geol. 131).....		2
Ceramic Chemistry (Cer. E. 301).....	3	
Ceramic Raw Materials (Cer. E. 303).....	3	
Raw Materials Testing (Cer. E. 310).....		2
Ceramic Calculations (Cer. E. 312).....		1
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/> 17	<hr/> 17

Senior Year		
Technical English (Eng. 141).....	3	
Power equipment (Min. E. 231).....		3
General Engineering Laboratory (Exp. E. 210).....	2	
Economic Geology (Geol. 182).....	3	
Manufacture of Clay Products (Cer. E. 321).....	4	
Clay Products Laboratory (Cer. E. 322).....		3
Limes and Cements (Cer. E. 326).....		3
Glasses, Glazes, and Enamels (Cer. E. 323).....	4	
Ceramic Engineering Laboratory (Cer. E. 324).....		2
Field Work and Report (Cer. E. 328).....		1
Thesis (Cer. E. 330).....		4
	<hr/> 16	<hr/> 16

The following courses are offered:

301. Ceramic Chemistry. Analysis of clays, glasses, glazes, and silicate minerals. Chemical study of fire gases.

Prerequisites: Chemistry 301, 401. Junior year; first semester; 3 credits; 3 laboratory periods. Deposit \$5.00.

303. Ceramic Raw Materials. The occurrence, properties identification, and winning of clays and other ceramic materials.

Prerequisite: Completed work of the freshman and sophomore years. Junior year; first semester; 3 credits; 3 recitations; 3 laboratory periods.

310. Ray Materials Testing. Continuation of the laboratory work of Cer. E. 303. Lectures at intervals as required.

Prerequisites: Cer. E. 303 and Chem. E. 471. Junior year; second semester; 2 credits; 2 laboratory periods.

312. Ceramic Calculations. Calculations involved in the blending of raw materials for pottery bodies, glazes, cements, etc. Practical ceramic problems.

Prerequisites: Cer. E. 303; Chem. E. 471. Junior year; second semester; 1 credit; 1 recitation.

321. Manufacture of Clay Products. Principles of the manufacture of clay wares, and the equipment used in drying and burning.

Prerequisite: Completion of the first three years of the Ceramic Engineering Course. Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods.

322. Clay Products Laboratory. Continuation of the laboratory work of Ceramic Engineering 321. Lectures at intervals as required.

Prerequisite: Cer. E. 321. Senior year; second semester; 3 credits; 3 laboratory periods.

323. Glasses, Glazes, and Enamels. Classification, production, properties, and defects. Methods of application to ceramic wares.

Prerequisites: Cer. E. 303 and 312; Chem. E. 471. Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods. Deposit \$2.00.

324. Ceramic Laboratory. Continuation of the laboratory work of Ceramic Engineering 323. Lectures at intervals as required.

Prerequisite: Cer. E. 323. Senior year; second semester; 2 credits; 2 laboratory periods. Deposit \$5.00.

326. Limes and Cements. Lime, cement, plaster and other cementing materials, and sand-lime products. Production, properties, and uses.

Prerequisites: Chem. 301 and 401. Senior year; second semester; 3 credits; 3 recitations.

328. Field Work and Report. Visits to cement, clay, and other related industrial plants; carefully written reports.

Prerequisites: Cer. E. 322 and 326. Senior year; second semester; 1 credit; 1 laboratory period.

330. Thesis. A careful study of some special ceramic problem.

Prerequisite: Completion of all ceramic courses offered before the second semester of the senior year.

Senior year; second semester; 4 credits; 4 laboratory periods. Deposit \$5.00.

399. Practical Work in Ceramics. For a description of this course, see Min. E. 299.

With the consent of the heads of the departments interested, students may be admitted to the ceramic courses from the other departments in the School of Mines, from the School of Engineering, and the department of Art and Architecture.

CHEMICAL ENGINEERING

WILLIAM HAWES COGHILL, Professor

JOHN FULTON, Professor of General and Analytical Chemistry

The work in Chemical Engineering is given jointly in the School of Mines and department of Chemistry. The course is intended to provide the instruction and training required by young men who desire to engage in the manufacture of those substances involving chemical processes and manipulations in their production.

Industries of this nature are so numerous and various that it is impossible to familiarize a student with all of them. The course is accordingly so presented as to give in the first half a thorough knowledge of all the fundamental engineering subjects and chemical processes, while the latter half is largely elective. This enables a student to specialize along chosen branches of chemical activity.

Throughout the work in this department, special attention is given to those industries that already exist in Oregon, or that must be put into operation if the resources of the State are to be properly developed.

DEGREE COURSES IN CHEMICAL ENGINEERING

Freshman and sophomore years are identical with the freshman and sophomore years of the Degree Course in Mining Engineering.

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Hydraulics (I. E. 102).....		3
Fire Assaying (Chem. E. 401).....	4	
Organic Chemistry (Chem. 201, 202).....	3	3
General Geology (Geol. 135).....	2	
Chemical and Metallurgical Processes (Chem. E. 431).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Fuels, Metallurgy of Iron and Steel (Chem. E. 410).....		2½
	16	16½
Senior Year		
Electrical Machinery (E. E. 403).....	3	
Physical Chemistry (Chem. 410).....	3	
Thermo-Chemistry (Chem. E. 452).....		3
Chemical Technology (Chem. E. 461, 462).....	4	4
Electro-Chemistry (Chem. 407).....	3	
Electro-Metallurgy (Chem. E. 442).....		3
*Approved Electives	3	6
	16	16

401. Fire Assaying. The crushing and sampling of ores and their assay for gold, silver, and lead; also the assay of various metallurgical products such as bullion, matte, etc. Special attention is given to the principles of the subject, which is treated from a scientific and rational point of view, rather than by "rule of thumb." Each student is required to make a large number of assays upon previously sampled and assayed pulps, and to learn to check these within very close limits.

Prerequisites: Chem. 301, 401; Geol. 112. Junior year of Mining Engineering course; first semester; 4 credits; 2 recitations;

* Elective courses may be chosen in the departments of Physics and Chemistry, and the Schools of Engineering, Forestry, and Mines, upon the approval of the Dean of the School of Mines and the heads of the other departments or schools concerned.

2 half days in the laboratory. Text: Fulton, Manual of Fire Assaying. Deposit \$20.00.

410. Fuels, Metallurgy of Iron and Steel. The metallurgical principles and processes involved in the preparation and use of fuels and refractory materials. The art and science of the smelting of iron ore and the manufacture and properties of steel are studied by lectures and use of an approved textbook.

Prerequisites: Chem. 301 and 401; Physics 101 and 102. Junior year; second semester; 2½ credits; 4 recitations.

412. Metallurgy of Lead and Copper. A detailed study of the furnaces, appliances, operations, and materials used in the extraction of these metals from their ores, and in refining them. Particular attention is given to the important principles underlying these processes.

Prerequisite: Chem. E. 401. Senior year of Mining Engineering course; second semester; 2 credits; 3 recitations.

421. Cyanidation of Ores. The cyanide process of extracting gold and silver from ores. The chemical principles involved in solution and precipitation are first mastered; then the operations and many mechanical devices in use are studied. Catalogues of leading manufacturers are freely used to illustrate the latest appliances.

Prerequisites: Chem. 301; Chem. E. 401. Senior year of Mining Engineering course; first semester; 2 credits; 3 recitations.

423. Metallurgical Laboratory. Each student determines by laboratory tests the fitness of a given ore for cyanide treatment; ascertains the percentage of extraction by various methods; and finally, studies costs and selects the process that should give the greatest net returns.

Prerequisite: Must be taken in conjunction with, or after the completion of, Chem. E. 421. Senior year of Mining Engineering course; first semester; 2 credits; 2 laboratory periods. Deposit \$5.00.

431. Chemical and Metallurgical Processes. Lectures supplemented by laboratory study of the general operations common to many industries, such as crushing, grinding, lixivation, filtration, evaporation, distillation, crystallization, etc., as well as the details of the various types of apparatus used for carrying on these processes.

Prerequisites: Chem. 301, 401. Junior year; second semester; 3 credits; 4 recitations; 1 laboratory period.

442. Electro-Metallurgy. A laboratory and lecture course in which are studied the principles and processes involved in those industries which require the use of the electric current in producing and refining metals.

Prerequisite: Chem. 406. Senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

452. Thermo-Chemistry. A continuation of Physical Chemistry in which the influence of temperature upon chemical reaction is studied more specifically than in the earlier course.

Prerequisite: Chem. 410. Senior year; second semester; 3 credits; 4 recitations; 1 laboratory period.

461. Chemical Technology. A lecture and laboratory course in which the more important chemical industries are studied in detail. Various problems connected with such industries are worked out by the student in the laboratory.

Prerequisite: Chem. E. 431. Senior year; first semester; 4 credits; 4 recitations; 2 laboratory periods.

462. Chemical Technology. A continuation of Chem. E. 461.

Prerequisite: Chem. E. 461. Senior year; second semester; 4 credits; 4 recitations; 2 laboratory periods.

499. Practical Work in Chemical Engineering. For a description of this course, see Min. E. 299.

PHARMACY

ADOLPH ZIEFLE, Professor
IRWIN LEONARD BETZEL, Instructor

Success in Pharmacy depends to a great extent on what preparation one makes for his work in the formation of correct habits of economy coupled with industry. The importance of a scientific training in pharmacy cannot be overestimated. This is true both as regards the pharmacist and the public, for the dispenser of medicines must be held responsible for the purity and strength of his preparations. The necessary education for conducting a modern pharmacy cannot be secured in a drug store alone, however valuable the experience gained therein may be. It is clearly evident that suitable preparation for the life-work of the practical pharmacist can only be given to one who has the necessary practical experience, as well as the proper educational training.

State boards of pharmacy, recognizing the importance of scientific pharmaceutical training, are requiring it in addition to a definite amount of practical drug-store experience as a prerequisite for registration.

Of late years the demand for educated pharmacists has been more urgent than ever before, on account of the enactment of State and National Pure Food and Drug Laws, as well as other laws that regulate the sale of medicinal substances. For these reasons, it is necessary that pharmacists adjust themselves to public sentiment, which expects pure drugs and medicines and competent persons to manufacture and dispense them. These requirements can only be attained through pharmaceutical education.

The necessary knowledge of the sciences on which the art of pharmacy is based and the technical skill required to practice that art, are best acquired in a well-equipped school of pharmacy. From the fact that very little teaching is done in drug stores, it becomes necessary for the successful pharmacist to have college training in order accurately to prepare medicines and dispense prescriptions. Aside from this, it often becomes necessary to identify drugs, detect accidental poisoning and to determine whether drugs are fit to be used in prescription work.

It is this kind of training that the department of Pharmacy at the Oregon Agricultural College is prepared to give. The department is conveniently located in Science Hall and the eight rooms that are used for instruction in the strictly pharmacy subjects are

very well equipped to give the proper instruction. The courses in pharmaceutical chemistry are given in the department of Chemistry which is also located in Science Hall.

One of the main objects of all young pharmacists is to pass a creditable examination before the State Board of Pharmacy. Preparation for such examinations is a special feature of the work of the department and its graduates have been most successful. Aside from enabling students to pass the pharmacy examination, however, the aim of the department is to afford an opportunity to obtain a thorough technical training that will equip the student for a life of efficient service in the profession of pharmacy from the practical point of view.

The courses of study meet the highest requirements of pharmaceutical instruction. The facilities for work are such that students who are interested can become most proficient in the manufacture and dispensing of drugs. The time spent in scientific pharmaceutical training will result beneficially for the people and to the profession of medicine in which pharmacy occupies a separate and distinct field.

Since the pharmacy curriculum requires more chemistry than any other course in the College, it is possible for students in pharmacy and special students to major in chemistry by electing the course in preparation for any position they have in mind. Graduates are constantly being sought by retail pharmacists as prescription dispensers, by manufacturing and wholesale druggists, by departments executing Federal and State Pure Food and Drug Laws, where they serve as chemists and inspectors.

Oregon is especially adapted to the cultivation of medicinal plants and it is only a question of time when the growing of drugs will prove to be a commercial enterprise for the State. The department of Pharmacy is especially fortunate in being able to give instruction along the line of drug cultivation. This is one of the features of the course in Pharmacognosy, a course in which students are taught to identify, cultivate, preserve, and understand all vegetable drugs.

A four-years course is academic and professional, leading to the degree of Bachelor of Science (B. S.). This is the most satisfactory course to elect, because it gives a broad collegiate training supplemented with the professional work of the two-years course. This course also includes thorough work in Bacteriology, Zoology, Botany, Food and Drug Chemistry, and Physiological Chemistry.

Many students who have completed the work of this degree have continued their study in schools of medicine. The entrance requirements for the above courses are the same as for other degree courses of the College.

A two-years course leading to the degree of Graduate in Pharmacy (Ph. G.) is offered, comprising the more professional studies of the curriculum. It prepares directly for drug-store and dispensing practice and provides a groundwork in analytical chemistry necessary for the drug business and the various phases of pharmaceutical manufacturing.

In addition to the above courses there is offered, for the benefit of students who are not graduates of a four-years high school, a vocational course in pharmacy. This course contains few strictly cultural subjects, but deals with all phases of Chemistry, Materia Medica, Prescription dispensing, and U. S. Pharmacopoeia. The aim of the course is to give the student the greatest amount of practical training, in the short time allowed, in order to fit him for the examinations of the State Board of Pharmacy, and at the same time assist him in becoming a more expert and efficient pharmacist. The requirements for this course are two years of high school training or its equivalent. This course extends over two years of nine months each. Upon completion of the prescribed work, the student will receive a certificate.

Students not candidates for a degree may enter this department as special students. The admission of special students is permitted after consultation with and upon recommendation of the Registrar or the professor in charge.

Students preparing to study Chemistry, Dentistry or allied subjects will find the course in Pharmacy especially well adapted for entrance to professional schools. Arrangements can be made whereby the student may elect such courses from the curriculum as are necessary to meet certain requirements.

Admission of advanced students: Students entering from collegiate departments of other colleges and universities must bring a certificate of honorable dismissal. Upon presentation of the proper credentials they will receive advanced credit for courses taken in institutions whose entrance requirements and character of work are equivalent to those of this department.

Equipment. The department's lecture rooms and laboratories are in Science Hall, a building which conveniently meets the needs for space, light, and ventilation.

The laboratories and lecture rooms are well equipped with all requirements necessary for practical instruction in pharmaceutical manipulation. Each laboratory is thoroughly equipped for a definite kind of work and the stock of the department is so complete that students have every opportunity to do efficient work. Students have individual desks supplied with a complete set of apparatus. Nearly all stock used by students is found on side shelves directly in the laboratory. All drugs not found on side shelves are obtained from the stock which is in charge of an assistant at all times during laboratory periods. This system for the distribution of drugs and apparatus to students works for the highest efficiency. Much of the student's time is saved thereby.

In addition to the usual permanent fixtures and apparatus for individual students, the department is supplied with a number of pieces of special apparatus for common use, such as pharmaceutical stills, tablet and pill machines, suppository machines, filter presses, and all of the apparatus that is necessary for thorough instruction in pharmacy. The prescription room is really a model drug store, containing accurate balances, capsule fillers, conical molds and such other apparatus as is necessary. The room for commercial pharmacy is equipped for sign-card painting and window dressing. Special tables for frames have been built for the work and each desk is supplied with compressed air for work with the air brush. The pharmacognosy room contains many cabinets filled with crude drugs, active principles, and many preparations. There is also the Eli Lilly & Co. exhibit of authentic crude drugs and preparations.

The pharmacy library contains the leading pharmaceutical journals, which are kept on file and are accessible to students. Students also have access, with certain restrictions, to all standard reference books on materia medica, chemistry, and pharmacy.

DEGREE COURSE IN PHARMACY

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 105, 106).....	5	2
Qualitative Analysis (Chem. 300).....		3
General Zoology (Zool. 101, 102).....	3	3
Pharmaceutical Botany (Bot. 70, 71).....	3	4
Elementary Pharmacy (Phar. 102, 103).....	1	1
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Sophomore Year		
Organic Chemistry (Chem. 201, 202).....	3	3
Quantitative Analysis (Chem. 400).....	4	
Zoology (Zool. 201, 202).....	3	3
Pharmaceutical Latin (Phar. 104).....	2	
Modern Language (French, German or Spanish).....	3	3
Principles of Economics (Com. 210).....		3
Business Law (Com. 311).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Junior Year		
Theoretical Pharmacy (Phar. 116).....	3	
Pharmacy Bacteriology (Bact. 201, 202).....	3	3
Modern Language	3	3
Practical Pharmacy (Phar. 117).....		3
Pharmaceutical Preparations (Phar. 118).....		2
Pharmacognosy (Phar. 130, 131).....	3	2
Inorganic Pharmacy (Phar. 121).....	3	
Alkaloidal Testing, Drug Assaying (Chem. 404, 405).....	2	2
Pharmaceutical Calculations (Phar. 123).....		2
Drill (Military 5, 6).....	1	1
	<hr/> 18	<hr/> 18

	Semester	
	1st	2nd
Senior Year		
Composition of Addresses (Eng. 103, 104).....	2	2
Materia Medica and Toxicology (Phar. 140, 141).....	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115).....	3	3
Food and Drug Analysis (Chem. 304).....	3	
Prescription Lectures (Phar. 150).....	3	
Prescription Incompatibilities (Phar. 151).....		3
Prescription Compounding (Phar. 152).....		2
Manufacturing Pharmacy (Phar. 170).....	2	
Physiological Chemistry (Chem. 409).....		3
	<hr/> 16	<hr/> 16

TWO-YEARS COURSE IN PHARMACY *

First Year		
General Chemistry (Chem. 105, 106).....	5	2
Qualitative Analysis (Chem. 300).....		3
Pharmaceutical Latin (Phar. 104).....	2	
Inorganic Pharmacy (Phar. 121).....	3	
Pharmacognosy (Phar. 130, 131).....	3	2
Theoretical Pharmacy (Phar. 116).....	3	
Practical Pharmacy (Phar. 117).....		3
Pharmaceutical Preparations (Phar. 118).....		2
Pharmaceutical Calculations (Phar. 123).....		2
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	½	½
Elective		2
	<hr/> 17½	<hr/> 17½

* This course leads to the degree of Graduate in Pharmacy. Students entering the course must have completed the full four-years high-school training.

	Semester	
	1st	2nd
Second Year		
Organic Chemistry (Chem. 201, 202).....	3	3
Materia Medica and Toxicology (Phar. 140, 141).....	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115).....	3	3
Prescription Lectures (Phar. 150).....	3	
Prescription Incompatibilities (Phar. 151).....		3
Prescription Compounding (Phar. 152).....		2
Manufacturing Pharmacy (Phar. 170).....	2	
Alkaloidal Testing (Chem. 404).....	2	
Drill (Military 3, 4).....	1	1
Electives		2
	<hr/> 17	<hr/> 17

VOCATIONAL COURSE IN PHARMACY *

First Year		
General Chemistry (Chem. 10, 11).....	3	3
General Pharmacy (Phar. C).....	4	
Inorganic Drugs (Phar. G).....	4	
Elementary Pharmacognosy (Phar. K).....	4	
General Pharmacy (Phar. D).....		4
Pharmaceutical Arithmetic (Phar. I).....		3
Pharmacognosy (Phar. L).....		3
Galenical Pharmacy (Phar. E).....		2
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> $16\frac{1}{2}$	<hr/> $16\frac{1}{2}$

* Entrance to this course requires two years of high-school preparation or its equivalent.

	Second Year	Semester	
		1st	2nd
Organic Chemistry (Chem. 200).....		4	
Pharmacopoeia and National Formulary (Phar. A, B).....		4	3
Therapeutics and Toxicology (Phar. M, N).....		3	3
Prescription Reading and Dispensing (Phar. O).....		3	
Advanced Galenical Preparations (Phar. F).....		2	
Prescription Incompatibilities (Phar. Q).....			3
Commercial Pharmacy (Phar. 160).....			3
Dispensing Pharmacy (Phar. S).....			2
Gymnasium (Phys. Ed. 17, 18).....		1½	1½
Drill (Military 3, 4).....		1	1
Electives			2
		17½	17½

The following descriptions are for the strictly pharmacy subjects, all courses in pharmaceutical chemistry are outlined in the chemistry schedule.

The following courses are offered:

102. Elementary Pharmacy. This course deals with: history of pharmacy and its development, standard pharmaceutical literature, demonstration of apparatus, and other elementary phases of pharmacy. The aim of the course is to give new students an idea of the subject by showing the relation of the various scientific courses in the pharmacy curriculum to each other.

Freshman year; first semester; 1 credit; 1 lecture. Text: Stevens, Pharmacy.

103. Elementary Pharmacy. A continuation of course 102 but deals with more advanced subjects in preparation for the courses in Pharmaceutical Latin and Theoretical Pharmacy.

Prerequisite: Phar. 102. Freshman year; second semester; 1 credit; 1 lecture. Text: Stevens, Pharmacy.

104. Pharmaceutical Latin. Latin is the language of science and all properly trained pharmacists need some knowledge of the principles of Latin etymology and construction in order to understand the use and terminology of pharmacy and medicine. The following subjects are made the basis of systematic study in this course: Latin abbreviations as used by physicians, Latin endings of drugs and medicines, prescription Latin, and English translation of all Latin terms used in pharmacy.

Sophomore year; first semester; 2 credits; 2 recitations. Text: Sturmer, Pharmaceutical Latin.

114. United States Pharmacopoeia and National Formulary. The object of this course is to apply the principles of all fundamental scientific courses such as, chemistry, materia medica, pharmacognosy, etc., to the subject of pharmacy. The Pharmacopoeias, Dispensatories, and National Formulary are the text-books used, and students are required to become very well informed as to the composition, uses, and methods of preparation of all official and unofficial remedies, as well as those newer remedies that are used most frequently. All strictly pharmacy courses are reviewed in preparation for the State Board of Pharmacy examination. Several intermediate examinations will be held, and the instructors will thus be enabled, by returning proper suggestions and directions, to aid students materially in equipping themselves for any pharmacy examination. Typical representative State Board questions will be used as a guide in preparing for the examination. There will be frequent reviews in identification of drugs and their preparations, as well as the careful systematization of all pharmacy subjects to permit of frequent reviews.

Prerequisites: Phar. 117, 118, Chem. 300, 201, 202. Senior year; first semester; 3 credits; 3 recitations. Text: U. S. Pharmacopoeia and National Formulary.

115. United States Pharmacopoeia and National Formulary. This is a continuation of course 114. As a special feature of the work, however, all scientific journals and state bulletins are reviewed, in order to familiarize students with the trend of State and National Pure Food and Drug work, as well as the various laws regarding the sale of drugs. The newer remedies are studied from the point of view of their composition, use, and incompatibilities. Other subjects of equal importance are discussed, the aim of the work being to prepare students for the actual needs in pharmacy.

Prerequisite: Phar. 114. Senior year; second semester; 3 credits; 3 recitations. Texts: U. S. Pharmacopoeia and National Formulary.

116. Theoretical Pharmacy. This course will begin with lectures defining pharmacy and allied sciences, and will embrace a study of the nomenclature of Pharmacopoeias and their importance as standard for drugs. Then will follow in order, lectures and demonstrations dealing with the principal processes employed in operative pharmacy; viz, weights and measures, heat, distillation, sublimation, extraction in its various forms, and other methods used in the manufacture of galenical preparations.

Prerequisites: Registration in Chem. 105 and Phar. 130. Junior year; first semester; 3 credits; 3 recitations. Text: Army, Principles of Pharmacy.

117. Practical Pharmacy. The natural products used in pharmacy are carefully defined and demonstrated. Then follows a study of the various classes of preparations such as: waters, sirups, tinctures, extracts, etc. Each class is defined and the various methods used in their preparation are illustrated and discussed. All preparations of the U. S. Pharmacopoeia are studied, particular attention being given to their constituents, percentage strength, method of preparation and reasons for each step, equations and synonyms.

Prerequisites: Phar. 116, Chem. 105. Junior year; second semester; 3 credits; 3 recitations. Texts: Army, Principles of Pharmacy. Ruddiman, Why's in Pharmacy.

118. Pharmaceutical Preparations. The object of this course is to teach students to put into practice the principles of Theoretical Pharmacy. While the student's work is individual, constant supervision of the instructor prevents inaccuracies and error in conception, and in this way wrong methods can be corrected. The work will embrace the determination of specific gravities by various methods, comparison of weights and measures, standardization of graduates and the tying and wrapping of carefully weighed packages. The main feature of the course, however, is accurately to prepare small amounts of the simpler preparations such as: waters, liquors, emulsions, pills, suppositories, etc.

The galenicals made are carefully inspected and at definite times identification examinations are held, at which time students are required to identify all preparations made and all ingredients used in their manufacture.

Prerequisites: Registration in Phar. 117 and Chem. 105. Junior year; second semester; 2 credits; 2 three-hours laboratory periods. Text: U. S. Pharmacopoeia. National Formulary. Laboratory Notes. Fee \$6.00. Deposit \$1.00.

121. Inorganic Pharmacy. This course deals with a study of official and unofficial inorganic drugs. The lecture work consists of a study of the elements and their compounds that are used in medicine. Their source, method of preparation, formulae, synonyms, physical and chemical characteristics are made the basis of systematic study. In the laboratory representative samples of each type of chemical will be made and samples of all official

inorganic drugs will be supplied to each student for identification study.

Prerequisites: Registration in Phar. 116 and Chem. 105. Junior year; first semester; 3 credits; 2 lectures and 2 two-hours laboratory periods. Text: Army, Principles of Pharmacy. Fee \$4.00.

123. Pharmaceutical Calculations. The various forms of calculations that are common to pharmacy are made the subject of systematic study; viz., equivalents of each system of weights and measures, calculation of proportionate parts of a formula, percentage solutions, specific gravity, alligation, and such chemical calculations as are met with in pharmacy.

Prerequisites: Phar. 116, Chem. 105. Junior year; second semester; 2 credits; 2 recitations. Text: Stevens, Pharmaceutical Arithmetic.

130. Pharmacognosy. This course deals with the macroscopical examination and study of official and unofficial animal and vegetable drugs. All drugs are properly classified in respect to their habitat, botanical order, constituent, synonyms, medicinal uses, and preservation. Frequent identification examinations are given so that students must become thoroughly familiar with the physical characters of drugs as well as their use.

Prerequisites: Registration in Phar. 104, 121, 116. Junior year; first semester; 3 credits; 3 recitations. Texts: Culbreth, Materia Medica. Schlotterbeck, Syllabus. Lilly, Organic Drugs. Fee \$1.00.

131. Pharmacognosy. A continuation of course 130 and the use of typical State Board of Pharmacy questions to supplement the work in preparing to become registered pharmacists. A special feature of the work of this course is the instruction in growing drugs on a commercial scale. Lectures and demonstrations will be given on preparation of soil, planting of seed, the care of drug plants, collection and preparation for market.

Prerequisite: Phar 130. Junior year; second semester; 2 credits; 2 recitations. Texts: Culbreth, Materia Medica. Schlotterbeck, Syllabus. Lilly, Organic Drugs. Fee \$1.00.

140. Materia Medica and Toxicology. Lectures and recitations on the properties, physiological actions, uses, and doses of all chemical, animal, and vegetable drugs, and their preparations. The different types of drugs are studied in groups according to their physiological action. The peculiar terms used to classify drugs according to their action and uses are carefully defined. The

subject of toxicology receives especial attention from the point of view of absorption, elimination, and cumulative action of poisonous substances. The signs and symptoms are studied in each case, and the antidote and medicinal treatment receive attention.

Prerequisites: Phar. 117, 118, and Chem. 201, 202. Senior year; first semester; 3 credits; 3 recitations. Texts: Tyrode, Pharmacology. Stearns, Dose Book. Fee \$1.00.

141. Materia Medica and Toxicology. A continuation of course 140. After the entire subject has been covered, preparation for the State Board of Pharmacy examination and the practical use of the subject follows. Each student will be required to familiarize himself with State pharmacy and drug laws, as well as other laws that regulate the manufacture and sale of drugs. The latter part of the course consists of lectures and laboratory work on First Aid to the Injured. Pharmaceutical jurisprudence is considered from the point of view of the trend of recent legislation affecting pharmacists, legal limits of pharmacy, liability of the seller of drugs, expert witness and all other phases of this subject.

Prerequisite: Phar. 140. Senior year; second semester; 3 credits; 3 recitations. Texts: Tyrode, Pharmacology. Stearns, Dose Book. Fee \$1.00.

150. Prescription Lectures. This course deals with the technical study of all phases of the prescription. It embraces particularly the very important subject of pharmaceutical, chemical, and therapeutical incompatibilities. The aim of the course is to give such theoretical instruction as will enable the student to devise the best method of compounding prescriptions in order that the mixture will be safe and represent what the physician wants. Each class of prescriptions is studied, particular attention being given to the art of preparing elegant remedies. Ambiguous prescriptions are read in class, and the question of overdose of such drugs that might prove to be poisonous is also studied.

Prerequisites: Phar. 117, 118; Chem. 300, 201, 202. Senior year; first semester; 3 credits; 3 recitations. Text: Scoville, Art of Compounding.

151. Prescription Incompatibilities. This is a continuation of course 150, the chief subject being that of incompatibilities. Several hundred different prescriptions are studied from the point of view of compounding the various ingredients of remedies in the best sequence. The literature is carefully abstracted in order that

students may become familiar with the manner of compounding the newer remedies that are not found in Pharmacopoeias. The aim of the work of this course is to teach students to detect dangerous prescriptions and to overcome incompatibilities.

Prerequisite: Phar. 150. Senior year; second semester; 3 credits; 3 recitations. Text: Ruddiman, Incompatibilities in Prescriptions.

152. Prescription Compounding. In this course students are expected to apply the principles of Prescription Lectures to the actual compounding of prescriptions. Many difficult and obscure prescriptions are submitted to students, who are called upon to deal with them as they deem best. In this way their ability as well as their knowledge is tested and if not accurate is corrected at once. The work of this course also deals with all the details of managing the prescription counter. The latter part of the course deals with perfecting of formulas for toilet preparations. Instruction is also given in the repair and making of mirrors, repair of apparatus, and other necessary operations common to a pharmacy.

Prerequisites: Phar. 150, 151; Chem. 201, 202, 300. Senior year; second semester; 2 credits; 2 three-hours laboratory periods. Text: Scoville, Art of Compounding. Fee \$6.00. Deposit \$1.00.

160. Commercial Pharmacy. The aim of this course is to give students an idea of the requirements of an efficient manager of a pharmacy. Regular topics relating to the commercial phase of pharmacy are discussed, such as planning and arrangement of a pharmacy, keeping up stock, salesmanship, window trimming, etc. A special feature of the course is the work in sign-card painting including extensive work with the air brush. For students not registered in the department the work is exclusively sign-card painting.

Elective; first semester; 3 credits; 1 recitation and two laboratory periods. Fee \$3.50.

161. Commercial Pharmacy. A continuation of course 160 with the added feature of taking of inventory, price lists, study of druggists sundries, side lines and air brush work. At definite times during the course successful business men will deliver lectures on the commercial side of pharmacy. For students not registered in the department, the work is exclusively sign-card painting.

Elective; second semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$3.50.

170. Manufacturing Pharmacy. This course is a continuation of the course on Pharmaceutical Preparations and deals with the manufacture of the more difficult pharmaceuticals that involve chemical reactions. The work is most exacting and requires a thorough knowledge of chemistry. As examples of the kind of preparations made, the following are mentioned; viz., spirits of nitrous ether, iodoform, ferrous iodide preparations, etc.

Prerequisites: Phar. 117, 118. Senior year; first semester; 2 credits; 2 three-hours laboratory periods. Text: U. S. Pharmacopoeia. Fee \$6.00. Deposit \$1.00.

VOCATIONAL COURSES

A. Pharmacopoeia and National Formulary. The object of this course is carefully to study all official drugs and preparations as found in the U. S. Pharmacopoeia, as well as all preparation in the National Formulary. Particular attention is given to their source, method of preparation, composition, percentage strength, etc. All work of this course is a review of the application of the principles of pharmacy and chemistry to all important official and unofficial drugs.

Prerequisites: Phar. D, E, and Chem. 11. Second year; first semester; 4 credits; 4 lectures and recitations. Texts: U. S. Pharmacopoeia; National Formulary.

B. Pharmacopoeia and National Formulary. A continuation of course A. As a special feature of this course store management will be made the subject of systematic study. This will include arrangement, location, advertisement, inventory, financing, etc.

Prerequisite: Phar. A. Second year; second semester; 3 credits; 3 recitations. Texts: U. S. Pharmacopoeia; National Formulary.

C. General Pharmacy. This beginning course in pharmacy includes a study of the theoretical phases of the subject. The work will commence with lectures defining Pharmacy and all sciences which contribute information relative to drugs. Then follows a discussion of metrology, heat, comminution, extraction, etc., the object being to give students a thorough training, by lecture and demonstration, of all processes and apparatus used in drug preparation.

Prerequisites: Registration in Phar. G, K, and in Chem. 10. First year; first semester; 4 credits; 4 lectures and recitations. Text: Army, Principles of Pharmacy.

D. General Pharmacy. This course deals with extemporaneous pharmacy or the application of the theory of pharmacy in preparing the various types of galenicals. The first part of the course deals with a study of the natural products used in pharmacy, then follows a study of each class of preparations, particular attention being given to the modes of preparation, preservation, and classification. The latter part of the course is devoted to the study of the official preparations found in the U. S. Pharmacopoeia.

Prerequisites: Phar. C; Chem. 10. First year; second semester; 4 credits; 4 lectures and recitations. Texts: Army, Principles of Pharmacy. Ruddiman, Why's in Pharmacy.

E. Galenical Preparations. The object in view in this course is to teach students to put into practice in the laboratory the principles of pharmaceutical manipulation taught in the lecture room. The course begins with a practice in the use and comparison of the various systems of weights and measures, specific gravity determinations, etc. Then follows the preparation of the simpler official and unofficial preparations. In this course students reach the point where each is competent to prepare such pharmaceutical preparations as are in common use.

Prerequisites: Phar. C, G and Chem. 10. Second year; second semester; 2 credits; 2 laboratory periods. Texts: U. S. Pharmacopoeia. National Formulary. Laboratory Notes. Fee \$6.00. Deposit \$1.00.

F. Advanced Galenical Pharmacy. This is a continuation of the course in galenical preparations and deals with the preparation of the more complicated pharmaceuticals, especially those involving chemical reactions. As a special feature of the work frequent identification examinations will be held on over 1000 different drugs and preparations. This is a decided advantage to the student because he becomes quite familiar with the physical characters of drugs and preparations, especially those of a poisonous nature.

Prerequisites: Phar. E, G and Chem. 11 and 200. Second year; first semester; 2 credits; 2 laboratory periods. Texts: U. S. Pharmacopoeia. National Formulary. Laboratory Notes. Fee \$6.00. Deposit \$1.00.

G. Inorganic Drugs. Lectures and demonstrations on the manufacture, composition, purity rubric, preservation, and identification of all inorganic drugs. In the laboratory representative samples of each compound will be prepared and tested according to the U. S. P. requirements. Each student will be given a sample

of each of the more important inorganic salts for identification purposes.

Prerequisites: Registration in Phar. C and in Chem. 10. First year; first semester; 4 credits; 3 lectures; 2 two-hours laboratory periods. Texts: Arny, Principles of Pharmacy. Laboratory Notes. Fee \$4.00.

I. Pharmaceutical Arithmetic. The various forms of calculations common to pharmacy and chemistry are made the subject of systematic study. Upon completion of this course students are capable of solving all mathematical problems common to a pharmacy.

Prerequisites: Phar. C and Chem. 10. First year; second semester; 3 credits; 3 lectures. Text: Stevens, Pharmaceutical Arithmetic.

K. Elementary Pharmacognosy. Crude vegetable and animal drugs are studied from the point of view of their official definition, constituents, habitat, synonyms, means of identification, etc. The student has access to the crude drug laboratories at all times, where typical specimens of all drugs and preparations are on display. This is an important feature of the work, because the best pharmacist is the one who can recognize the characteristics of crude drugs and preparations and thereby avoid serious error in compounding.

Prerequisites: Registration in Phar. C, G, and in Chem. 10. First year; first semester; 4 credits; 4 lectures. Texts: Lilly, Organic Drugs. Schlotterbeck, Syllabus. Fee \$1.00.

L. Pharmacognosy. A continuation of course K. During the latter part of the course typical State Board of Pharmacy questions will be used in preparation for the State examination in this subject.

Prerequisite: Phar. K. First year; second semester; 3 credits; 3 lectures. Texts: Lilly, Organic Drugs. Schlotterbeck, Syllabus. Fee \$1.00.

M. Therapeutics and Toxicology. A study of the action of chemicals, drugs, and their preparations on the human organism in health and disease, also the physiological action of the various poisons, their antidotes and emergency treatment in cases of poisoning. The peculiar terms used in medicine will be carefully defined.

Prerequisites: Phar. D, E, and Chem. 11. Second year; first semester; 3 credits; 3 lectures and recitations. Texts: Tyrode, Pharmacology. Stearns, Dose Book. Lecture Notes. Fee \$1.00.

N. Therapeutics and Toxicology. A continuation of course M and as a special feature of the course the subject of First Aid to the Injured will be taught by demonstration and actual practice. Typical State Board of Pharmacy questions will also be reviewed in preparation for the State examination in this subject.

Prerequisite: Phar. M. Second year; second semester; 3 credits; 3 lectures and recitations. Texts: Tyrode, Pharmacology. Stearns, Dose Book. Lecture Notes. Fee \$1.00.

O. Prescription Reading and Dispensing. This course involves a technical study of all phases of the prescription, practical exercise at sight reading and in the art of extemporaneous compounding. The nomenclature of the prescription and prescription Latin will receive especial attention.

Prerequisites: Phar. D, E, and registration in Chem. 200. Second year; first semester; 3 credits; 3 lectures and recitations. Text: Scoville, Art of Compounding.

Q. Prescription Incompatibilities. Lectures and recitations on the many forms of incompatibilities with the view of detecting them and thus avoiding incompatibility by scientific combination of the ingredients. Over 500 different kinds of incompatibilities will be discussed, as well as those of the newer synthetic remedies.

Prerequisites: Phar. O and Chem. 200. Second year; second semester; 3 credits; 3 lectures. Text: Ruddiman, Incompatibilities in Prescriptions.

S. Dispensing Pharmacy. This course embraces the methods of compounding the various types of prescriptions in the laboratory. The habit of neatness, accurate checking, correct pricing, and, above all, of precision acquired by students in this work, is of direct and immediate advantage to them in their life work as pharmacists.

Prerequisites: Phar. O, F and Chem. 200. Second year; second semester; 2 credits; 2 laboratory periods. Text: Scoville, Art of Compounding. Laboratory Notes. Fee \$6.00. Deposit \$1.00.

ART AND RURAL ARCHITECTURE

FARLEY DOTY McLOUTH, Professor
LAWRENCE EUGENE ROBINSON, Assistant Professor
EDNA MAY FLARIDA, Instructor
EDITH FREEMAN SHERMAN, Instructor

The department of art offers no regular courses in art with the idea of instruction in the fine arts in view, but only as art education relates to highest ideals in everyday life, and to meet the requirements of art in the industries. Courses in drawing, composition, light and shade and color are planned and given for the purpose of facilitating instruction in the applied arts courses — design, metal work, clay modeling, and the ceramic art; and in the work of such other departments as Agriculture, Domestic Art, and Industrial Arts.

The art courses offered not only develop utilitarian ideas, but they also cultivate an appreciation and love of the beautiful in nature and art.

Equipment. The department occupies three commodious, well-lighted studios on the fourth floor of Agricultural Hall, two draughting rooms on the second floor of Science Hall, a metal-working laboratory and a clay-modeling and pottery studio in Waldo Hall. The studios have north light, are well heated and ventilated and are equipped with suitable studio furniture and accessories, such as casts, still life prints, potter's wheel, tools, and benches. The department is also well supplied with wall drawings, pictures, and port-folios illustrating the different phases of the work.

The College Library has a well-selected and growing reserve in art and architecture, covering all branches of the subjects.

102. Free-Hand Drawing. This course covers the work in representation; still life in line and dark and light; free-hand perspective of circles and linear perspective; some of the principles of composition and design; Egyptian ornaments; the handling of pencil and charcoal.

The degree courses in Home Economics; freshman year; first semester; 2 credits; 2 studio periods of two hours each, and one recitation. Fee \$0.50.

103. Beginning Composition. The study of design principles applied to concrete problems of dress or home decoration; brush and ink, charcoal, and pencil are used as media. Greek design is studied.

Prerequisite: Drawing 102. The degree courses in Home Economics; freshman year; second semester; 2 credits; 2 studio periods of two hours each and one recitation. Fee \$0.50.

204. The Theory and Harmony of Color. This course covers the study of the so-called primary colors, the development of the prismatic colors with their complements, color quality, color values and the various harmonies. Problems in monochromatic, complementary, analogous and dominant harmonies are to be rendered. These problems will be an application of harmonious color schemes as applied to articles of household use, dress, and home interiors.

Prerequisites: Art 102, 103. Degree course in Home Economics; sophomore year; first semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

205. Water Color. The courses in water color are offered as elective cultural subjects and are open to any student who has completed courses 102, 103, and 204, or their equivalent. The work of the first semester will include simple flat washes of geometric casts, and flat color washes of still life subjects of broad area.

First semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

206. Water Color. A continuation of course 205, leaving flat washes and taking up more complex still-life studies, posters, and landscapes.

Prerequisite: Art 205. Second semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

305. Advance Design. An elective offered to give a broader working knowledge of design principles which shall serve as a guide to selection, adaptation, and composition, both structural and decorative, for practical application in interior decoration, costume design, and for articles of personal and household use.

First semester; 2 credits; 3 studio periods of two hours each. **Prerequisites:** Art 102, 103, and 204. Fee \$0.50.

306. Advanced Design. A continuation of course 305.

Prerequisites: Art 102, 103, 204, and 305. Second semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

411. Industrial Arts Drawing. Free-hand perspective and working sketches of wood joints, furniture, and machine parts; and drawing from written descriptions.

The degree course in Industrial Arts; freshman year; second semester; 2 credits; 3 studio periods of two hours. Elective;

M. E. Vocational course; first year; second semester; 1 credit; 3 studio periods of one hour each. Fee \$0.50.

412. Industrial Arts Design. A course in the principles of design suited to the Industrial Arts course. Original design plates of door and cabinet paneling, metal parts, hinges, escutcheons, draw pulls, etc., and furniture, will be required.

The degree course in Industrial Arts; sophomore year; first semester; 1 credit; 3 studio periods of one hour. Fee \$0.50.

413. Clay Modeling and Pottery. The study of the modeling and making of pottery occupies most of the time. Different ways of making and decorating vases will be studied, using the hand work and the potter's wheel. Modeling from nature, tile building, mold and cast making in plaster, firing and glazing.

Prerequisites: Art 102 and 103. Elective; the degree courses in Home Economics; senior year; first semester; 2 credits; 3 studio periods of two hours each. Fee \$2.00.

414. Clay Modeling and Pottery. A continuation of course 413 with more advanced work and more time given to clay modeling.

Prerequisites: Art 102, 103, or their equivalents, and 413. Elective; the degree course in Home Economics; senior year; second semester; 2 credits; 3 studio periods of two hours each. Fee \$2.00.

505. Water Color Rendering. The purpose of this course in water color rendering is to give a knowledge of the handling and use of the brush and color in the expression of landscape gardening subjects, detail, and decoration.

Fee \$0.50.

506. Water Color Rendering. A continuation of course 505, followed by full color drawings of landscape gardening subjects. Later in the semester opportunity is given for out-of-door sketching in color.

Elective; degree course in Landscape Gardening; sophomore year; second semester; 2 credits; 2 studio periods of three hours each.

The following courses are open to other students who have completed courses 102 and 103 or their equivalents and to Industrial Arts students having completed courses 411 and 412 or their equivalents. Fee \$0.50.

600. Jewelry Making. The first semester will be given to work in jewelry-making, using copper and silver, and covering the processes of sawing, hard and soft soldering, stone setting, etching, and repousse.

Prerequisites: Art 102, 103, or their equivalent. Elective; the degree course in Home Economics; or any student having the desired prerequisites; 2 credits; 6 studio periods. Fee \$1.00. Deposit \$2.00.

601. Jewelry Making. A continuation of course 600, with the addition of enameling.

Prerequisites: Art 102, 103, and 600. Elective; the degree course in Home Economics; or any student having the desired prerequisites; second semester; 2 credits; 2 studio periods of three hours each. Fee \$1.00. Deposit \$2.00.

602. Art Metal Work. The work of the first semester will cover the processes of piercing, etching, sinking, sawing, riveting, straight bending and repousse, in the making of such articles as desk sets, book ends, trays, ladles, bag tops, plates, hinges, corners, etc.

Industrial Arts students; 2 credits; 3 two-hours periods. Fee \$1.00. Deposit \$2.00.

603. Art Metal Work. The second semester work will be largely the problems of raising, hard and soft soldering, and soft enameling, in the making of pitchers, vases, etc.

Industrial Arts students; 2 credits; 3 two-hours periods. Fee \$1.00. Deposit \$2.00.

RURAL ARCHITECTURE

The courses in architecture are offered first to students in agriculture who may major in rural architecture or elect subjects pertaining to farm structures; to students in industrial arts who take house planning; to students in landscape gardening who take subjects in landscape architecture; to students in home economics who take house construction and decoration, and to all others who are interested in rural and domestic architecture and are prepared to take the subjects.

The work is especially adapted to meet the utilitarian requirements of the other departments of the College and to serve these departments in an able manner. The courses consist of problems in design and construction and a consideration of building materials.

For students of agriculture the course amounts to agricultural engineering. It is important for men who contemplate this work in agricultural colleges, who intend to develop farm establishments, who favor structural work or who themselves have buildings to erect.

The following courses are offered:

518. Perspective Drawing. A study of mechanical perspective. Elective; sophomore year; second semester; 1 credit; 1 draughting room period. Fee \$0.50. Text: Frederick, Simplified Mechanical Perspective.

533. Agricultural Building Design. This course is for students of agriculture. Design and construction of buildings for the farm are studied. The work is individual; thus each student may elect the particular kind of buildings in which he is especially interested.

Agriculture; elective; first semester; 2 credits; 2 draughting room periods of three hours each. Fee \$0.50. Text: Howe, Agricultural Drafting.

535. Advanced Agricultural Building Design. A continuation of course 533.

Agriculture; elective; second semester; 2 credits; 2 draughting room periods. Fee \$0.50.

536. Farm Plan Drawing. The work of this course is prescribed for students studying farm management. The conventional methods of indicating lines, roads, fields, etc., will be carefully presented.

Agriculture; elective; first semester; 1 credit; 1 draughting room period. Fee \$0.50. Text: Howe, Agricultural Drafting.

537. Farm Structures. Advanced drawing of concrete and frame structures. Details of construction, sanitation, and economic principles as advanced by other departments will receive strict attention. This course is for students who wish to specialize in agricultural engineering or rural architecture.

Prerequisites: Arch. 533 and 535. Agriculture; elective; first semester; 4 credits; 4 draughting room periods. Fee \$1.00.

538. Farm Structures. A continuation of course 537.

Agriculture; elective; second semester; 4 credits; 4 draughting room periods. Fee \$1.00.

601. Elementary Landscape Architectural Drawing. This course takes up lettering and line drawing at the beginning and

develops into the study of the presentation of garden plans. The relation of architecture to the garden will be observed in all drawings and various architectural styles will be noted. Only pen and ink drawings will be presented.

Landscape Gardening; freshman year; first semester; 3 credits; 3 draughting room periods. Fee \$0.75.

602. Advanced Landscape Architectural Drawing. A continuation of course 601, in which drawings will be made using water colors.

Landscape Gardening; freshman year; second semester; 3 credits; 3 draughting room periods. Fee \$0.75.

603. Landscape Architectural Design. Problems in the design of gardens and grounds presented not as working drawings but as rendered sketch drawings showing geometry of plan, color scheme and perspective.

Prerequisites: Arch. 601, 602 and 518. Landscape Gardening; junior year; first semester; 3 credits; 3 draughting room periods. Fee \$1.00.

604. Landscape Architectural Design. A continuation of course 603.

Landscape Gardening; junior year; second semester; 3 credits; 3 draughting room periods. Fee \$0.75.

701. Elementary House Planning. This course consists of practical problems in planning and construction. All drawings will be working-drawings presented on detail paper. The work is prescribed for Industrial Arts students.

Industrial Arts; junior year; first semester; 3 credits; 3 draughting room periods. Fee \$0.75.

702. Advanced House Planning. A continuation of course 701.

Industrial Arts; junior year; second semester; 3 credits; 3 draughting room periods. Fee \$0.75.

D. A. 501. House Construction and Decoration. (See page 304, School of Home Economics.)

Fee \$0.50. Text: Robinson, Domestic Architecture.

D. A. 502. Advanced House Construction. A continuation of D. A. 501.

Domestic Art; elective; second semester; 2 credits; 2 draughting room periods of two hours each. Fee \$0.50. Text: Robinson, Domestic Architecture.

CHEMISTRY

JOHN FULTON, Professor

* HERMAN VANCE TARTAR, Associate Professor

RENTON KIRKWOOD BRODIE, Associate Professor

MILO REASON DAUGHTERS, Assistant Professor

RAYMOND ADAMS DUTCHER, Assistant Professor

MILTON JOHN SEELEY, Instructor

ROBERT ANDREW DUNCAN, Instructor

SYLVESTER BOYER, Instructor

HARRY GEORGE MILLER, Instructor

The beginner's courses, Chemistry 100, 101, and 102, consist essentially of the proof of some of the well-known chemical laws, such as the law of conservation of matter, the law of definite proportions and of multiple proportions, the Law of Boyle, and the Law of Charles. The student attains skill in the manipulation of apparatus, and in the management of equipment in general. From this elementary work he proceeds to qualitative analysis, in the study of which he is taught to separate and identify the different elements composing the mass, and, in the case of metals, to learn of their properties, their use, the different methods of obtaining them from their ores, and the combinations in which they occur in nature.

If he has shown suitable proficiency, he advances to quantitative analysis, which is the determination of the amounts of the ingredients. He is taught both methods of analysis, volumetric, or the method by solution, and the gravimetric, or the method by precipitation and weighing. On completing these courses, the student is fairly well prepared to take up advanced chemistry, which treats of the analysis of soils, manures, cattle foods, dairy products, etc., or he can take up the subject from the inorganic side in the analysis of minerals, fuels, oils, gas, etc., or he can view it from the pharmacist's standpoint, in analyzing drugs.

Equipment. The department of Chemistry occupies nearly the whole of Science Hall, except the fourth floor, which is occupied by the department of Pharmacy, and a few rooms on the third floor that are at present used by the department of Rural Architecture. The Chemical department of the Experiment Station has four rooms on the second floor.

The largest room in the building is the main general laboratory, which will accommodate 550 students in four sections. Adjacent to this laboratory is the general stock room, that in itself is a

* On leave of absence 1917-18.

division of the department. It is well stocked with all the necessary apparatus and chemicals required for all the courses given in the department. One of the greatest improvements in the Chemical department is the new gas machine; this, when working at its full capacity, can supply gas for 800 burners.

The new organic laboratory has been increased in size until it now contains room for 240 students. The equipment is of the best.

The new quantitative analysis room now has accommodations for 96 students in four sections. Its equipment of hot and cold water, gas, pressure pumps, etc., makes it as good as the best.

The qualitative analysis room can accommodate 50 students in three sections. Great pains have been taken to make this room as nearly an actual chemical work room as possible.

In the balance room there are 23 analytical balances.

The main lecture room, which is situated on the third floor, has a seating capacity of 150. It is provided with lecture tables that are supplied with gas, electricity, and water. Adjoining the lecture room is a small preparation room, in which is kept all special apparatus used for lecture demonstration, as well as supplies for the agricultural laboratory. This room is equipped with all the necessary apparatus for the proper elucidation of the principles of this branch of chemistry.

For the work in Quantitative Analysis (advanced), an entire room is set aside. This room is fitted with gas, water, and electricity; condensers for distilled water; batteries; extraction apparatus for fats; nitrometers; Kjeldahl apparatus; hot-water filtering apparatus; grinders for fodders, steam and air baths, calorimeter, polariscope, Westphal and analytical balances; coarse balance for rough work, hot-plates, and minor apparatus.

COURSE IN AGRICULTURAL CHEMISTRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 75 to 77.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Agricultural Chemical Analysis (Chem. 505).....	3	
Organic Synthesis (Chem. 305).....		3
Trigonometry (Math. 11).....	3	
College Algebra (Math. 21).....	2	
Elementary Algebra (Math. 31).....		5
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives	4	7
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Agricultural Analysis (Chem. 507, 508).....	4	4
Elementary Physical Chemistry (Chem. 410).....	3	
Thermo and Electro Chemistry (Chem. 411).....		3
Seminar in Chemistry (Chem. 511, 512).....	1	1
Physiological Chemistry (Chem. 409).....		3
Electives	6	3
	17	17

Electives may be taken in Chemistry, Physics, Botany, Zoology, Plant Physiology, Animal Physiology, Mathematics, Modern Language, Anatomy, Geology, etc.

Graduate Courses. The following courses may be taken by graduate students as major or minor electives with full credit: Chemistry 104, 302 to 316 inclusive, and 502 to 512 inclusive. The department reserves the right to require additional work in certain cases before credit for these courses be awarded toward an advanced degree.

The following courses are offered:

10. General Chemistry. Fundamental principles of the science; non-metallic elements and their compounds.

Prerequisites: Mathematics A and B. Required of all students who have not had elementary chemistry in high school, except those registered in the degree courses in Pharmacy, Mining, Commerce (Elective), and Landscape Gardening. Freshman year; first semester; 3 credits; 1 lecture; 2 recitations; 2 laboratory periods.

Fee \$3.00. Deposit \$2.00. Text: Smith, General Chemistry for College (Revised.)

11. General Chemistry. Non-metallic and metallic elements and their compounds. Conceptions of chemical equilibrium and the modern theory of solutions frequently applied.

Prerequisite: Chemistry 10 or its equivalent. Freshman year; second semester; 3 credits; 1 lecture; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

12. Elementary Household Chemistry. A course arranged for women who do not care to take the full chemical courses leading to the degree in Home Economics. As its name implies, it is a fragmentary elementary course in the application of chemistry to daily life, rather than an exposition of chemical principles.

It treats of such subjects as the relation of combustion to heat, lights and illuminants; commercial soaps; special soaps and scouring powders; general composition of foods; functions of food; textile fibres; bleaching and bluing, etc.

First semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each. Text: Snell, Elementary Household Chemistry.

13. Elementary Household Chemistry. A continuation of 12. Freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each. Fee \$3.00. Deposit \$2.00.

Courses 12 and 13 will not be accepted as substitutes for courses 100 and 101.

100. General Chemistry. Fundamental principles; non-metallic elements and their compounds.

Prerequisite: Elementary High School chemistry. Required of all students having had chemistry in the high school (see note below) registered in the degree courses, except Pharmacy, Mining, Commerce (Elective), and Landscape Gardening. Freshman year; first semester; 3 credits; 2 recitations or lectures; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Smith, General Chemistry for Colleges.

101. General Chemistry. Non-metallic and metallic elements and their compounds. Conceptions of chemical equilibrium and the modern theory of solutions are frequently applied.

Prerequisite: Chemistry 100 or its equivalent. Freshman year; second semester; 3 credits; 2 recitations or lectures; 2 laboratory

NOTE — Students who have had one year of chemistry in a standard high school may be permitted to take an examination for credit in Chemistry 10 and 11 provided their high-school credits are not used as entrance units. This examination will be held one week after the opening of the first semester. Laboratory note books must be presented.

periods. Fee \$3.00. Deposit \$2.00. Text same as for Chemistry 100.

102. General Chemistry. This course is especially arranged for the students of the School of Home Economics.

Freshman year; first semester; 2 recitations; 2 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

103. General Chemistry. A continuation of course 102.

Freshman year; second semester; 2 recitations; 2 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

104. Chemical Calculations. Calorimetric; specific gravity; gas calculations; calculations of atomic weights and formulas; gravimetric analysis; volumetric analysis.

Prerequisite: Quantitative analysis. Elective; junior or senior year; first or second semester; 2 credits; 2 recitations. (Note: A minimum of 5 students required.) Text: Ashley, Chemical Calculations.

105. General Chemistry for Mining, Chemistry, Chemical Engineering, and Pharmacy students especially, but also open to others who desire to complete General Chemistry, and Qualitative Analysis during the first year.

Freshman year; first semester; 5 credits; 3 recitations; 2 laboratory periods of three hours each. Fee \$5.00. Deposit \$2.00.

106. General Chemistry. A continuation of 105, but with this difference, that Qualitative Analysis succeeds the laboratory manual used in the first semester. This course is open to any one having completed 101, or its equivalent.

The general chemistry text is used as the basis of the recitations in this course which is really descriptive chemistry.

Freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods of three hours each. Fee \$5.00. Deposit \$2.00. Text: Baskerville and Curtman, Qualitative Analysis.

200. Elementary Organic Chemistry. A study of fundamental principles and more important compounds; petroleum and its products, alcohols, ethers, aldehydes, fatty acids, oils, soaps.

Prerequisite: Chemistry 11 or 101. Course in Home Economics, and Vocational Pharmacy; sophomore year; first semester; 4 credits; 2 recitations; 3 laboratory periods. Fee \$4.00. Deposit \$2.00. Text: Cohen, Organic Chemistry.

200-a. Elementary Organic Chemistry. A course of lectures in Organic Chemistry for those desiring lectures alone and having no time for laboratory work. This course is designed primarily for

agricultural students, and should be taken before or with Agricultural Chemistry. It may be taken also by students of other departments who wish to extend their chemical studies in this direction.

Prerequisite: Chemistry 101 or 103. Elective; sophomore year; either semester; 2 credits; 2 lectures.

201. Organic Chemistry. Asphaltic compounds; hydrocarbons, alcohols, ethers, esters, aldehydes, acids, fats, ketones, amines, carbohydrates. Preparation and identification of typical and simple compounds.

Prerequisite: Chemistry 11 or 101. Course in Pharmacy; sophomore year; and Chemical Engineering; junior year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Cohen, Organic Chemistry.

202. Organic Chemistry. Aromatic Compounds; cyclic hydrocarbons, nitro derivatives, amines, diazo compounds, phenols, dyes, proteins, alkaloids.

Prerequisite: Chemistry 201. Course in Pharmacy, sophomore year; and Chemical Engineering, junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Cohen, Organic Chemistry.

203. Textile Chemistry. Consists of identification of the different materials used in the textile industries.

Junior year; second semester; 2 credits; 1 lecture; 2 laboratory periods of two hours each. Prerequisite: Chemistry 200. Fee \$2.00. Deposit \$2.00.

300. Qualitative Analysis. This course consists largely of laboratory practice in the ordinary process of separating and identifying ions. It is given in conjunction with 106, and in fact constitutes the laboratory part of the above course.

Freshman year; first semester; 3 credits; 3 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00. Texts: Smith, Chemistry. Baskerville and Curtman, Qualitative Analysis.

301. Qualitative Analysis. A course provided for Mining students who have completed 101, or equivalent.

Freshman year; first semester; 5 credits; 2 recitations and three laboratory periods of three hours each. Fee \$5.00. Deposit \$2.00. Texts: Smith, Chemistry. Baskerville and Curtman, Qualitative Analysis.

301-a. Qualitative Analysis. A general course for all students desiring to complete this number during the first semester.

Prerequisite: Course 100. Three credits; 3 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00.

301-b. Qualitative Analysis. A continuation of 301-a consisting of investigation of the properties of the rarer metals.

Prerequisite: Course 100. Three credits; 1 lecture; 2 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00.

302. Qualitative Analysis. Students in Highway Engineering. Three credits; 1 recitation; 3 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

303. Organic Qualitative Analysis. A course for Pharmacy students.

Elective; second semester; 3 credits; 2 recitations; 2 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00.

304. Food and Drug Analysis. This course affords suitable preparation for the students to hold positions in the Federal Food and Drug Laboratories.

The food and drug products on the market that are subject to the greatest adulteration will be analyzed for preservatives and other added materials.

Prerequisites: Organic Chemistry and Botany. Senior year; 3 credits; 3 laboratory periods. Fee \$3.00. Deposit \$2.00.

305. Organic Synthesis. The synthesis of the more complex organic compounds of both the aliphatic and aromatic series, coupled with such reference work as may be to the advantage of the student. The class work in the course will be in the form of a seminar.

Prerequisites: General, qualitative, quantitative, and beginning organic chemistry. Elective for Agricultural Chemistry, Pharmacy, and other students having sufficient training. Senior year; first semester; 3 credits; one seminar and 2 three-hours laboratory periods. Fee \$3.00. Deposit \$2.00.

400. Quantitative Analysis. A course designed for students in Pharmacy, and consisting of instruction in both gravimetric and volumetric analysis of pharmaceutical products.

Prerequisite: Course 105. Sophomore year; first semester; 4 credits. Fee \$4.00. Deposit \$2.00.

400-a. Elementary Quantitative Analysis. A course designed for all students desiring to extend their chemical studies.

Prerequisite: Chemistry 300 or 301-a. Required of all Agricultural students; sophomore year; first semester; 3 credits; 1 lecture; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

400-b. Elementary Quantitative Analysis. A course along same lines but slightly extended.

Prerequisite: Chemistry 300 or 301 or 301-a. Required of Pharmacy students; sophomore year; first semester; 4 credits; 1 lecture; 3 laboratory periods of three hours each. Fee \$4.00. Deposit \$2.00.

400-c. Elementary Quantitative Analysis. Similar to 400-a and 400-b, but more extended.

Required of all Chemical and Mining Engineering students; sophomore year; first or second semester; 5 credits; 1 lecture; 4 laboratory periods of three hours each. Fee \$5.00. Deposit \$2.00.

401. Quantitative Analysis. This is a course in analysis for Mining students, and consists of gravimetric analysis of limestones, iron, lead, zinc, arsenic, and antimony ores, coal, and as much other work as time will permit.

The course in Mining Engineering; sophomore year; first semester; 5 credits; 1 recitation; 4 laboratory periods. Fee \$5.00. Deposit \$2.00. Text: Frank and Clemens.

402. Chemistry of Foods. A qualitative and quantitative examination of sugars, fats, proteins, leavening agents. Adulteration of foods, with simple methods of detection; food legislation.

Prerequisite: Chem. 200. Required of all students in Home Economics; sophomore year; second semester; 4 credits; 2 recitations; 3 laboratory periods. Texts: Leach, Food Inspection and Analysis. Olsen, Pure Foods. Sherman, Food Products. Sherman, Organic Analysis. U. S. Bul. 107 (revised). Fee \$4.00. Deposit \$2.00.

403. Chemistry of Water. This course is especially for the students in Highway Engineering, and consists of the examination of waters for potability, and for adaptability for industrial purposes. This course is divided into two parts; first, Sanitary Water Analysis, which investigates the methods of analysis applied to water and sewage, as outlined by the American Public Health Association; second, Chemical Studies of Industrial Waters, which includes the examination of various waters with reference to their adaptability to industrial processes such as heating plants, laundries, paper mills, etc.

Junior year; second semester; 2 credits; 2 laboratory periods. Text: Standard Methods of Water Analysis. A. P. H. A. Fee \$2.00. Deposit \$2.00.

404. Alkaloidal Testing. A study of the alkaloids of the drug plants as regards their structure and synthesis. The means of

their identification by the various alkaloidal tests will be studied in the laboratory as well as the means of identifying those organic compounds that enter pharmaceutical preparations. This course will also include the means of detection of the common poisons in the animal body.

Prerequisites: Chemistry 100, 101, 300, and 201. First semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

405. Drug Assaying. The quantitative estimation of the active principles of crude drugs and their preparations, such as solid and fluid extracts, tinctures, pills, etc. The assay of a number of inorganic pharmaceutical preparations will be included in this course.

Methods for the physiological standardization of drugs and drug preparations will be discussed by the instructor.

Prerequisites: Chemistry 100, 101, 300, 201, and 404. Second semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

406. Chemistry of Highway Materials. The course is designed for students in Highway Engineering, and consists of the study of such materials as cement, asphalt, bitumen, mineral oils, tar, and tar products.

The course in Highway Engineering; junior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

407. Applied Electro-Chemistry. Applications of the electric current to analytical operations; electroplating; electrolytic oxidation and reduction; storage batteries; the electric furnace, etc.

Prerequisites: Chemistry 401 or its equivalent and Chemistry 410 and 411 or their equivalent. Chemical Engineering; senior year; first semester; 3 credits; 1 conference; 6 to 8 hours a week in laboratory. Fee \$3.00. Deposit \$2.00. Text: Thompson, Applied Electro-Chemistry. Laboratory Outline of Electro-Analysis.

408. Chemistry for Engineers. This course is particularly for students in Mechanical and Electrical Engineering. It consists of the analysis of coal, oil, gas, and of their calorific powers; also the technical analysis of flue gases.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

409. Physiological Chemistry. Chemical study of the fats, carbohydrates, and proteins; discussion of enzyme action, digestion, absorption, and excretion; analysis of blood, gastric juice, and both normal and pathological urine; and demonstrations and assigned reading.

Prerequisites: General and organic chemistry. Pharmacy, Domestic Science, and Agricultural Chemistry; senior year; second semester; 3 credits; 2 lectures and 2 two-hours laboratory periods. Fee \$2.00. Deposit \$2.00.

410. Elementary Physical Chemistry. Molecular weight determinations; properties of liquids; dilute solutions; solubilities; conductivity of solutions; chemical equilibrium; velocity of reactions.

Prerequisites: Mathematics 31 and Chemistry 401 or their equivalent. Chemical Engineering and Agricultural Chemistry; junior or senior year; 3 credits; 2 lectures and recitations; 1 laboratory period of 4 hours. Fee \$3.00. Deposit \$2.00. Text: Senter, Outlines of Physical Chemistry. Findlay, Practical Physical Chemistry.

411. Principles of Thermo-Chemistry and Electro-Chemistry. Thermochemical measurements; relation of chemical affinity to heat of reaction; conductivity of solutions; electromotive force.

Prerequisite: Chemistry 410. Chemical Engineering and Agricultural Chemistry; junior or senior year; second semester; 3 credits; 1 conference; 6 to 8 hours a week in laboratory. Fee \$3.00. Deposit \$2.00. Texts: Otswold-Luther, Physico-Chemical Messungen. Findlay, Practical Physical Chemistry. Thomsen, Thermochemistry. Leblanc, Electro-chemistry. Senter, Outlines of Physical Chemistry.

412. Metallurgical Analysis. This consists of the analysis of Metallurgical and Engineering materials, such as limestone, cement, coal, iron ore, copper matte, brass, bronze, steel, babbitt metal, water, oil, etc.

The course in Chemical and Mining Engineering; sophomore year; second semester; 3 credits; 3 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Sidener, Quantitative Metallurgical Analysis.

413. Chemical Technology. A course of lectures in the principles of Organic, Analytical, and Technical Chemistry as applied to those industries depending upon chemistry as a basis for their processes.

The course in Chemical Engineering; senior year; first semester; 2 credits. A continuous course; credit will not be awarded until the second semester's work has been completed.

414. Chemical Technology. A continuation of course 413.

The course in Chemical Engineering; senior year; second semester; 2 credits. Text: Thorpe, Industrial Chemistry.

415. Methods of Teaching Chemistry. A course designed for those who expect to teach chemistry in secondary schools. Lectures, reports, discussions. A critical study will be made of laboratory, experiments, equipment, sources of materials, modern textbooks, and manuals.

Prerequisites: Chem. 100, 101, 200, and 402.

416. Food Industries. A critical study of cereals, breakfast foods, beverages, animal foods, milk products, spices and condiments. Illustrated with lantern slides.

Prerequisite: Chemistry 402. Elective; junior or senior year; second semester; 2 credits; 2 recitations. Fee \$2.00. Deposit \$2.00. Text: Vulte and Vanderbilt. Food Industries.

417. Methods in Gas Analysis. Required of all Mining students.

Prerequisite: Chem. 401. Sophomore year; second semester; 1 credit; 1 laboratory period of three hours. Fee \$1.00. Deposit \$2.00.

418. Elementary Glass Blowing and Repairing. A course in the elements of the art of welding, cutting, and grinding glass. For upper classmen only, especially for those who expect to become instructors in science in High Schools.

Junior or senior year; 1 credit; 1 laboratory period of three hours. Fee \$2.00. Each person procuring his own glass and files. Text: Woollatt, Laboratory Arts, or Frary, Glass Blowing.

500. Agricultural Chemistry. A general course consisting of lectures, recitations, and laboratory work, dealing with the more important phases of Chemistry in its relation to Agriculture.

Prerequisite: Chemistry 101. The course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations. Fee \$3.00. Deposit \$2.00. Text: Tartar and Dutcher, Lecture Notes on Chemistry in its Relation to Agriculture.

501. Agricultural Chemistry. A continuation of course 500. The course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

502. Dairy Chemistry. A course consisting of lectures, recitations, and laboratory work dealing with the chemistry of milk, milk powders, condensed milk, butter, oleomargarine, cheese and other dairy products.

Prerequisites: Chemistry 500 and 501. Required of students majoring in Dairy Manufacturing; junior year; second semester;

3 credits; 3 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00. Text: Bulletin 107, U. S. Bureau of Chemistry. Lincoln and Walton, Quantitative Chemical Analysis. Assigned reading.

503. Soil Chemistry. This is a lecture and laboratory course dealing with the constitution and properties of the chemical constituents of soils; the methods of qualitative and quantitative chemical soil analysis; the chemical changes taking place in soils; the soil solution; and chemical soil deficiencies.

Prerequisite: Chemistry 501. Junior year; first semester; 2 to 4 credits; 2 to 4 laboratory periods of three hours each. Fee \$1.00 per credit. Deposit \$2.00.

504. Soil Chemistry. A continuation of course 503.

Junior year; second semester; 2 to 4 credits; 2 to 4 laboratory periods of three hours each. Fee \$1.00 per credit. Deposit \$2.00.

505. Agricultural Analysis. A course in analytical methods applied to agricultural materials, including cereals, fertilizers, soil, water, vinegar, insecticides, fruit juices, feeding stuffs, etc.

Prerequisites: Chemistry 500 and 501. First semester; 2 to 4 credits; 2 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

506. Agricultural Analysis. A continuation of course 505.

Second semester; 2 to 4 credits; 2 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

507. Advanced Agricultural Analysis. This course is special work in the Experiment Station laboratory, or work of the same general description.

Senior year; first semester; 3 to 4 credits; 3 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

508. Advanced Agricultural Analysis. A continuation of course 507.

Senior year; second semester; 3 to 4 credits; 3 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

509. Animal Chemistry. A study of the composition of the animal body and products of the animal body, such as milk, wool, etc. Special emphasis is placed on the chemistry of the fats, proteins, and carbo-hydrates. Enzyme action, digestion of foodstuffs, their absorption and distribution, fate of the foodstuffs in metabolism, metabolic products and their excretion, will be considered. Recent publications bearing on animal nutrition will be read and discussed.

Prerequisite: Chem. 501 or its equivalent. Junior year; first semester; 2 credits; 2 lectures. Fee \$2.00. Deposit \$2.00.

510. Plant Chemistry. Designed for students desiring a fuller consideration of the growth and composition of plants; properties, nature, and classification of plant constituents; chemical analysis; chemical synthesis; enzymes; chemistry of the manufacture of plant products, etc.

Prerequisite: Chemistry 501 or its equivalent. Second semester; 2 credits; 2 lectures. Text: Haas and Hill, Chemistry of Plant and Plant Products. Assigned reading.

511. Seminar. The work will consist of reports and reviews of articles appearing in scientific journals, and experiment station literature. These papers will be prepared under the supervision of the department, although considerable latitude will be allowed in the selection of subjects and manner of presentation. Required of all senior students majoring in Agricultural Chemistry.

Junior or senior year; first semester; 1 credit.

512. Seminar. A continuation of course 511.

Second semester; 1 credit.

Before taking up the subject of chemistry, students are advised to review thoroughly the elementary principles of physics, especially those related to the mechanics of gases, liquids, and solids with reference to their densities, specific gravities, solubilities, rates of diffusion, etc. Excellent summations are given in Black and Davis' Practical Physics, of which a two-weeks review is given before entering upon any of the elementary courses in Chemistry. This review will consist of lectures and demonstrations, and assignments of problems.

A. Elementary Chemistry. Fundamental laws of chemistry; general properties of matter; non-metallic elements and their compounds; special attention to oxidation and reduction.

Vocational students in Mechanic Arts; second year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: McPherson and Henderson, Elementary Chemistry.

B. Elementary Chemistry. Metals; their compounds; alloys; special attention to chemical behavior of metals under shop conditions.

Prerequisite: Chemistry A. Vocational Students in Mechanic Arts; second year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

ENGLISH LANGUAGE AND LITERATURE

FREDERICK BERCHTOLD, Professor
IDA BURNETT CALLAHAN, Associate Professor
SIGURD HARLAN PETERSON, Assistant Professor
LOREN BURTON BALDWIN, Instructor
GERTRUDE EWING McELFRESH, Instructor
GRACE CHRISTINE ROSAEN, Instructor
CHARLES JARVIS McINTOSH, Instructor

It is the aim of this department to teach the student to express with clearness what he thinks with vigor. He is taught that the essential part of any composition, whether oral or written, is thought, well organized and well expressed; that to comprehend clearly and to feel strongly what he has to say are the indispensable conditions of making others comprehend and feel it.

What his textbook helps him to do consciously, familiarity with superior writers should help him to do unconsciously; for we may get good from a master of English by unconscious absorption, just as we acquire good manners by associating with gentlemen and ladies. No mind can fail to be stimulated by contact with greater minds, whether living or dead. Their pages feed the powers of thought and strengthen the power of expression, thus enabling the student to think, talk, and write to more purpose.

In all the collegiate courses in English the work is correlated with that offered in the other departments, to bring it into harmony with the trend or spirit of the institution, which is distinctly technical and industrial in character. Subjects are assigned for presentation and discussion which bear close relation to the work pursued by the students in the different schools, in anticipation of their probable needs and activities in later life. What is sought and insisted on is, earnest, logical, forceful presentation of facts that will compel attention and carry conviction.

The Oregon Agricultural College participates in a number of intercollegiate oratorical contests and debates; and the department offers elective courses in public speaking, designed to give preparation for these contests.

The following courses are offered:

31. **College Rhetoric.** A rapid survey comprehending the work done by the high school in literature, rhetoric, and composition, and involving the preparation of several short essays, with a view to ascertaining the extent of the student's literary appreciation and command of rhetorical principles. Lectures, assignments, and recitations upon the methods of effective discourse. Studies in the

expository and argumentative methods of writing, with analysis of specimens. The paragraph considered as a distinct stage in expository composition; practice writing to exemplify the various methods of developing the topic statement. Plotting of simple briefs, and writing of easy forensics. At every stage of study selections from standard and contemporary authors will be read and discussed, in order that the student may acquire ability to master content, differentiate literary types, and appreciate standards of excellence. Subjects of composition will be those suggested by the student's personal, school, literary, community, and vocational interests. Oral composition supplementing written.

Compositions required: five expository and three argumentative short themes; one expository theme requiring research and accompanied by outline and bibliography; one resume and one criticism; one argumentative long theme, accompanied by brief. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that the student writes in other departments.

Prerequisite: Three years of English in an accredited high school. Courses in Home Economics and Industrial Arts; freshman year; first semester; 3 credits; 3 recitations. Text: Boynton, Principles of Composition.

32. Advanced College Rhetoric. Study of the elements and principles involved in effective discourse, continued. Lectures on the characteristics of the literature of feeling, with rendering of selections for illustration. Discussion of the narrative and descriptive methods of writing. Expository and emotional description differentiated. Examination of the narrative principle in epic forms, in ballad literature, and in the incidents occurring in the drama, in the news letter, and in anecdote. Studies and practice writing in the narrative paragraph and in dialogue. Analysis of two or three of the briefer and less complex short stories of standard authors, for the purpose of gaining an appreciation of the form and function of the short story type.

Written composition, confined, for the most part, to the descriptive and narrative types of discourse, will be similar in character to that of the first semester. Frequent oral delivery.

Prerequisite: Eng. 31. Courses in Home Economics and Industrial Arts; freshman year; second semester; 3 credits; 3 recitations. Text: Boynton, Principles of Composition.

51. The English Essay and Novel. Study of structure of novel and essay. Study of essay and novel as expressions of national life and thought. Emphasizing the growth of the economic, critical, historical, and personal essay, and the larger categories of fiction: the novel of manners, of character, the problem novel, and the romantic novel. Class and individual assignments, lectures, and reports.

Prerequisite: Eng. 32. Course in Home Economics; sophomore year; first semester; 3 credits; 3 recitations. Text: Fulton, *Essays for Use in College Courses*.

52. The English Drama. Study of the structure and technique of the drama as a distinct literary type. A survey of the rise and development of the tragedy, the comedy, and the historical play. Study of setting, plot, and character as they are employed in the drama. Reading of plays in class; collateral readings; reports on assigned topics.

Prerequisite: Eng. 31, 32. Courses in Home Economics; sophomore year; second semester; 3 credits; 3 recitations. Text: Woodbridge, *The Drama: Its Laws and Technique*.

61. The History of English Literature. A general outline course of the history of English literature. This includes a survey of the principal forms of literature as exemplified by the masters in each field. The aim is to cultivate an appreciation of what is excellent in quality and form. Masterpieces representing the best thought and form are studied in class or assigned to students for careful reading and reports. Field of study: English literature from its beginning to the end of the eighteenth century.

Elective in all courses; first semester; 3 credits; 3 recitations. Text: Crawshaw, *The Making of English Literature*.

62. The History of English Literature. A continuation of course 61. A study of the master minds of the nineteenth century. Lectures, readings, and discussions; critical reports on assigned topics required from all the students.

Elective in all courses; second semester; 3 credits; 3 recitations. Text: Crawshaw, *The Making of English Literature*.

71. American Literature. A study of the growth and development of literature in our country. Particular emphasis is placed on the study of writers of the nineteenth century, including such authors as Irving, Cooper, Bryant, Poe, Hawthorne, Longfellow, Holmes, and Lowell, as well as to prominent writers of the present day. Lectures; class study; class reading; reports on assigned topics; essays.

Elective in all courses; senior year; first semester; 3 credits; 3 recitations. Text: Wendell and Greenough, *History of Literature in America*.

72. American Literature. A continuation of course 71. The metropolitan writers; literature in the South; literature in the West; present schools and tendencies; periodical literature. Lectures; class room work; reports; essays.

Elective in all courses; senior year; second semester; 3 credits; 3 recitations. Text: Wendell and Greenough, *History of Literature in America*.

81. Modern English Prose. A study of representative modern prose writers, with special reference to prose as found in such present-day standard periodicals as *The Literary Digest*, *The Independent*, and *The Outlook*. Study of the newspaper paragraph. Practice in reporting lectures. Exercises in the elaboration of field notes. Drills looking to the popularization of technical matters and the results of experiments. Drafting of resolutions; writing of syllabuses; reduction of the article to a single short paragraph and to a single sentence; analytical outlines of expository articles; finding in a disputation article the proposition upheld and its supporting points; interpretation of advertisements. Writing of papers and reports. Theme writing. Oral composition.

Prerequisite: Completion of a four-years high school course. The courses in Agriculture, Mechanical Engineering, Highway Engineering, Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy. Freshman year; first semester; 3 credits; 3 recitations. Texts: Lomer and Ashmun, *The Study and Practice of Writing English*. *The Independent*; *The Outlook*; *The Literary Digest*. Woolley, *Handbook of Composition*.

85. Modern English Prose. A course designed for students in Forestry and Logging Engineering. It includes composition and letter writing, practice in reporting lectures, exercises in the elaboration of field notes, drills looking to the popularization of technical matters, practice in oral delivery and parliamentary procedure, and exercises in elementary Business English with particular application to Forestry and Logging Engineering.

Freshman year; first semester; 2 credits; 1 recitation; 1 laboratory period. Text: Lomer and Ashmun, *The Study and Practice of Writing English*. Collateral reading: *American Forestry*.

86. Modern English Prose. A continuation of English 85.

Prerequisite: Eng. 85. Freshman year; second semester; 2 credits; 1 recitation; 1 laboratory period. Text: Lomer and Ash-

mun, The Study and Practice of Writing English. Collateral reading: American Forestry.

91. Modern English Prose. The frame work of this course is the same as that employed in English 81. In its details, however, constant reference is had to the particular needs of the student in Mining Engineering.

Freshman year; first semester; 2 credits; 2 recitations. Text: Lomer and Ashmun, The Study and Practice of Writing English. Supplement: The Electrical and Mining Engineering Journal.

92. Modern English Prose. A continuation of course 91.

Prerequisite: Eng. 91. The course in Mining Engineering; freshman year; second semester; 1 credit; 1 recitation.

101. Special Composition. If a student, in his work in any department, submits papers notably deficient in English, his Dean, or major professor, will require him to take course 101. It consists wholly of theme work and consultations, and is continued in each case as long as the needs of the student require. This course carries no credits.

All courses; first and second semesters; 2 recitations.

103. Composition of Addresses. This course deals with the composition of the most important kinds of addresses, including the argument, the eulogy, the commemorative address, and various forms of non-forensics. The work consists of lectures, a study of textbooks, analysis of masterpieces, practice in the composition of the various forms, and frequent class-room exercises.

Elective in all courses; junior year; first semester; 2 credits; 2 recitations. Text: Baker, Forms of Public Address.

104. Extempore Speaking. Practice in the presentation of the various forms of addresses. Speeches are prepared on topics of special interest to the students and delivered with the view to making them most effective as means in the advancement of a particular cause. Extensive criticism is offered as to methods of selection, organization and presentation.

Elective in all the courses; junior year; second semester; 3 credits; 3 recitations. Text: Baker, Forms of Public Address.

105. Practical Public Speaking. Practice in the presentation of the various forms of public addresses, voice training, study of gesture, bearing, and the elements of ease, grace, and force in presentation. Practice in the rapid preparation and in the impromptu delivery of speeches on topics of current interest. Designed for those who wish some general training in public speaking. Drill in parliamentary procedure.

Prerequisite: 104. Elective; first semester; 3 credits; 3 recitations. Text: Robinson, *Effective Public Speaking*.

106. Practical Public Speaking. Continuation of course 105.

Prerequisite: Eng. 105. Elective; second semester; 3 credits; 3 recitations. Text: Robinson, *Effective Public Speaking*.

107. Argumentation. Practical work in brief-drawing, the collection and handling of evidence, and debating. Each student will prepare several debates under the direction of the instructor; construct briefs and participate in class room debates. Personal consultation with the instructor on thought, composition, and delivery. This course is a critical and practical study of argumentation. The class is limited in number, and the course can be taken only with the consent of the instructor.

Elective; second semester; 2 credits; 2 recitations. Text: Foster, *Argumentation and Debate*.

108. Oratory. This course is intended as special preparation for those who wish to enter oratorical work. The work consists of lectures on the theory of oratory, the preparation of original orations, class room exercises, and personal conferences and criticism. The course can be taken only with the consent of the instructor.

Elective; first semester; 1 credit; 1 recitation. Text: Shurter, *The Rhetoric of Oratory*.

141. Technical English. The writing which the engineer has to do is almost wholly of the nature of exposition. Indeed, it is only in so far as it is expository that it offers any problems different from those which arise in general composition. In technical English, then, in the engineering courses, attention is centered on exposition of the various types which the engineer has to use, in description, in narration, in directions, in criticism, and in argumentation.

At all times it will be insisted on that whatever facts the student expresses, shall be expressed accurately; that the treatment of the subject shall be complete for the purpose in hand; that the form of presentation shall be logical; and that the expression shall be economical for the reader.

Prerequisite: 6 credits of college English. The courses in Engineering, Soils, and Farm Management; elective in all other courses; junior or senior year; second semester; 2 credits; 2 recitations. Text: Earle, *Theory and Practice of Technical English*.

142. Technical Business English. The preparation of the manuscript and copy for the printer. The study of and extensive

practice in proof-reading. The study of the advertising circular, students being required to plan and complete circulars for various advertising purposes. Practice of writing informal trade agreements, specifications, and other business forms.

Prerequisite: Eng. 143 or its equivalent. The course in Commerce; freshman year; second semester; 3 credits; 3 recitations.

143. Advanced Commercial Correspondence. Review of the essentials of correct and effective English: clearness, interest, proper punctuation, grammatical correctness, effective diction. The business letter in detail, special attention being given to letters of application, letters of inquiry and information, circular letters, letters of complaint, sales letters, follow-up letters, and collection letters. Study of postal regulations.

The course in Commerce; freshman year; first semester; 3 credits; 3 recitations. Text: Lewis, Business English.

191. Story-Telling. The study of children's literature, and the analysis and reproduction of short stories suitable for the primary grades, the kindergarten, and the nursery.

Elective in the course in Home Economics; senior year; first semester; 1 credit; 1 recitation.

192. Story-Telling. A continuation of course 191.

Elective in the course in Home Economics; senior year; second semester; 1 credit; 1 recitation.

206. Expression. Literary interpretation, including analysis, memorizing, and rendering of selected masterpieces of prose and poetry. The aim of this course is to enable the student not only to understand and appreciate the thought and spirit of literature, but to render it naturally and effectively; to correct erroneous habits of speech, and to give freedom, purity, and strength of tone to cultivate the power of expression through imagination; to eliminate artificiality, affectation, and self-consciousness.

Elective; first semester; 2 credits; 2 recitations.

207. Expression. Continuation of course 206.

Elective; second semester; 2 credits; 2 recitations.

208. Dramatic Interpretation. Advanced literary interpretation. Training in delivery of masterpieces of prose and poetry. Interpretative study of Shakespeare and the modern drama; presentation of scenes from plays; bodily expression; impersonation.

Prerequisites: Course 206 and 207. Elective; first semester; 2 credits; 2 recitations.

209. Dramatic Interpretation. Continuation of course 208

Elective; second semester; 2 credits; 2 recitations.

301. Elementary News-Writing. Instruction and training in judging news values, gathering and writing news, and in newspaper correspondence. Writing news technical to Agriculture, Home Economics, Engineering, Commerce, Forestry, etc. Open to students of junior rank and others especially recommended by the professor of English. Required as a condition of eligibility for leading positions on student publication staffs.

Elective in all courses; junior year; both semesters; 2 credits; lecture and laboratory period.

302. Advanced News-Writing. A continuation of course 301, dealing with special technical and feature writing, reporting, copy reading, editorial writing, proof-reading, make-up, and head-writing, with field work in writing specials to various publications.

Prerequisite: English 301 or its equivalent. Elective in all courses; junior or senior year; both semesters; one credit; one lecture.

315. Seminar. Study and review of the recognized masterpieces of European Continental literature in approved translations.

Elective in all courses; first semester; 2 credits; 2 recitations.

316. Seminar. A continuation of course 315.

Elective in all courses; second semester; 2 credits; 2 recitations.

E. Junior Secondary English. The object of offering this course is to afford students not having completed the English work of the third year of the secondary school an opportunity to take that work.

The course contemplates, in part, a survey of English literature, during the first and second semesters. A study is made of the characteristics of literary epochs, attention being especially directed to the shaping influence of contemporary civil events. Study of a typical masterpiece belonging to each epoch. Assigned readings, followed by oral and written reports.

The work in Rhetoric and Composition involves intensive study and practice in the four forms of discourse already studied in the first two years of the secondary school, the aim of such intensive study and practice being the establishment of the student in good usage.

No textbook is prescribed for Rhetoric and Composition; the principles of Rhetoric will be evolved from the written work prepared and presented by members of the class. The subjects of compositions, whether written or oral, will be chosen, as a rule, from the epochs surveyed, the writers studied, and the books read. Those planning to pursue the course are requested to secure, in

order to have at hand a convenient reference, Brooks' two-books course in English Composition, used in the high schools of Oregon.

Prerequisite: Course J or its equivalent. The vocational course; first semester; 3 credits; 3 recitations. Text: Long, English Literature.

F. Junior Secondary English. Continuation of E. The work in written Composition requires several Expository and several Argumentative themes of such length and of such literary quality as shall thoroughly test the student's ability for sustained, consistent thinking, clear expression, and a just literary appreciation. Oral composition supplementing written, will be a feature of each week's class work. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that he writes in other departments.

Prerequisite: Eng. E. or its equivalent. The vocational course; second semester; 3 credits; 3 recitations. Courses in Home Economics and Industrial Arts; freshman year; first semester; 3 credits; 3 recitations. Text: Canby et al, Composition in Theory and Practice.

G. Vocational English. Review of English Grammar. The purpose of the work in English Grammar, as prescribed in Course G and in subsequent Vocational English courses, is such an intensive study of, and persistent drill in, the fundamentals of the subject as shall establish the student in relatively correct usage. The accomplishment of this end is sought by giving the work with such frequency and by such concrete methods as shall tend to create in the student a liking for the subject of English Grammar. Identification and analysis of sentences. Punctuation. Written and oral exercises in spelling. The specific aim of written composition is the development of the sentence sense, the avoidance of the common grammatical errors in expression, and the production of a legible manuscript. Use is made of the letter as a medium for the solution of simple but actual business problems. Written reproduction of short articles. Short narrative themes. Oral composition comprehending the reproduction of articles, the explanation of processes and mechanisms, and the narration of incidents.

The course in written and oral expression is supplemented by a course of reading designed to enable the student, by helping him to acquire a command of language, the more effectively to discharge the duties of his vocation, to create pleasure for himself in

reading good books, and to develop the practice of reading into a habit for life.

The vocational course; first year; first semester; 3 credits; 3 recitations. Text: Baskervill and Sewell, *English Grammar*. Books for reading: Fowler, *Starting in Life*; *Choosing a Career*. Richardson, *The Girl Who Earns Her Own Living*.

H. Vocational English. Special attention is given, in the study of Grammar, to the identification of the parts of speech, the classification and uses of clauses, and the conjugation of the verb. Punctuation, with drill primarily on the uses of the comma. The logical arrangement of thoughts as represented in the outline will be discussed and illustrated. In written composition, the content and mechanics of the letter are given particular consideration. Exposition of concrete objects. Narrative writing. Oral composition will treat current events and subjects listed for written composition.

Prerequisite: Eng. G. Vocational course; first year; second semester; 3 credits; 3 recitations. Text: Huntington, *Elements of English Composition*. Periodical: *Current Events*. Books for reading: Hale, *What Career?* Rollins, *What Can a Young Man Do?* Alden, *Women's Ways of Earning Money*.

I. Advanced Vocational English. Study of the structure and functions of phrases; the correction of the common errors in etymology and syntax. Punctuation. Writing reports on newspaper and magazine articles; writing advertisements; drafting simple specifications. Oral composition comprehending current events, sales talks, and informal debates.

Prerequisite: Eng. I. Vocational course; second year; first semester; 3 credits 3 recitations. Text: Webster, *English for Secondary Schools*. Periodicals: *Youth's Companion*, *Boy's Magazine*, *Popular Mechanics*, *World Magazine*. (The student will subscribe for at least one periodical in the foregoing list.) Books for reading: Shaw, *The Outlook for the Average Man*. Reid, *Careers for the Coming Men*. Abbot, *Women and Industry*.

J. Advanced Vocational English. Modifications of the verb; drill on the sequence of tenses; practice in the detection and the correction of the more elusive forms of false syntax. Review of Punctuation. The aim of the work in written composition is to improve diction, increase vocabulary, and develop greater variety, force, and directness of expression. Reports on articles in books, magazines, and newspapers. Reports on actual business exper-

iences. Letter writing. Oral composition involving conversations on problems in business and actual life.

Prerequisite: Eng. I. Vocational course; second year; second semester; 3 credits; 3 recitations. Text: Gardiner, Kittredge and Arnold, Manual of Composition and Rhetoric. Books for reading: Kaufman, The Efficient Age. MacLean, Wage Earning Women.

M. Elementary Business English. Besides giving a thorough training in the various forms of commercial correspondence, the course aims to ground the student in the vocabulary, forms, and usages peculiar to business and administrative pursuits. There is constant and persistent practice in spelling and punctuation, in composition and letter writing, with a view to imparting to the student's English strength and virility, and to enable him to achieve results.

Two-years Business course; second year; first semester; 3 credits; 3 recitations.

N. Elementary Business English. A continuation of course M. Advanced composition and letter writing; business forms, incidental writing; summaries; advertising; preparation of copy and proof-reading. Good, clear, effective English is at all times insisted upon.

Prerequisite: Eng. M. Two-years Business course; second year; second semester; 3 credits; 3 recitations. Text: Lewis, Business English.

HISTORY

JOHN B. HORNER, Professor

The study of history is fundamental to leadership, there being no line of human investigation that does not depend upon historic knowledge. History is required in Commerce and is offered as an elective in all other schools of the Oregon Agricultural College.

The instruction is largely given by lectures illustrated with lantern views. In the more advanced classes, each student is required to prepare at least one lecture. Although textbooks are required, the work in the various courses in history is done in connection with the college library, which is accessible to students on all week days.

The courses given at present are as follows:

30. European History. Course 30 includes the study of Europe at the time of Louis XIV; reconstruction of Europe at Utrecht; Russia and Prussia become European powers; Wars of Frederick the Great; Struggle between France and England for India; Rivalry of France and England in North America; The Old Regime in Europe; The Spirit of Reform; Enlightened Despots of the Eighteenth Century; The French Revolution; The First French Republic; Europe and Napoleon; The Reconstruction of Europe at the Congress of Vienna.

Elective; first semester; 3 credits; 3 recitations. Text: Robinson and Beard, *The Development of Modern Europe*, Vol. I.

40. Modern Europe. This course comprises a study of the following subjects: Europe after the Congress of Vienna; The Industrial Revolution; Revolution of 1848; Unification of Italy; Formation of the German Empire and the Austro-Hungarian Union; The German Empire; France under the Third Republic; Social and Political Reforms in England; British Empire in the Nineteenth Century; Russian Empire in the Nineteenth Century; Turkey and the Eastern Question; The Expansion of Europe in the Nineteenth Century; Some of the great problems of today.

The course in Commerce; sophomore year; second semester; 3 credits; 3 recitations. Text: Hazen, *Europe Since 1815*.

52. History of the British Empire. A coherent view of the larger factors influencing national development from the earliest times to the British Empire of today. Social, economic, artistic, and intellectual growth is broadly surveyed, and is made to reveal a picture of the changing conditions of the people rather than that

of the king and nobility. Legal and constitutional development is also emphasized by tracing the origin and development of English common law and by discussing the nature and importance of the great statutes. Particular attention is given to such subjects as the Industrial Revolution, Growth of the Power of the House of Commons, the Extension of the Franchise, Remedial Legislation, and Colonial and Imperial Development.

Elective; senior year; first semester; 3 credits; 3 recitations. Text: Green, History of England and Greater Britain.

62. Contemporary American History. The history of the United States from the Discovery of America to the present time. Collateral with the text-books such matters as the negro question, the industrial revolution, capitalism and socialism, free silver, direct government, woman suffrage, the growth of judicial review, the new nationalism, imperialism, the labor movement, the progressive movement, the Panama-Colombia question, present status of the Monroe Doctrine, and our relation with the Latin-American republics, are discussed from the standpoint of history.

Prerequisite: History D or its equivalent. The course in Commerce; freshman year; second semester; 3 credits; 3 recitations. Text: Bassett, History of the United States.

70. History of Oregon. Early explorations. Lewis and Clark expedition. Minor expeditions. Fur trade. Rivalry between companies. Era of immigration. Oregon organized under Hudson Bay Company. Agitation in Congress for military occupation of the Columbia. The Nez Perce Indians ask for the Bible. Response by Methodists and Congregationalists. Doctor Whitman and the Oregon movement. Struggle for the Willamette. Struggle for the Columbia. First transcontinental wagon road. Provisional government. Progress of immigration and missions. Gold excitement. Subdivision of Oregon into territories. Indian wars. Home building. Disposition made of the Indians. Oregon becomes a state. Introduction of improved fruit, grains, and stock. Ships and railways. Select schools, public schools, and higher education. Oregon literature. Industrial training, and introduction of scientific methods. Irrigation; conservation of forests. "The Oregon System" of direct legislation.

The course in Commerce; sophomore year; first semester; elective second semester; 3 credits; 3 recitations. Text: Clarke, Pioneer Days of Oregon History.

80. American Diplomatic History. This course deals with the history of the chief events in American foreign affairs from the beginning of the government to the present time. Its purpose is to show the policies of our government on the same subject at different times, the causes for the changed policies, and the methods employed to work out the policies. An attempt is made to show the changed attitude of governments in their dealings with each other in the course of our national history. Throughout the course considerable attention will be given to character studies of the men leading in our diplomatic work. The ultimate aim is the application of our experience to present problems.

Elective; senior year; second semester; 3 credits; 3 recitations.

100. American Biography. A study in the public careers of typical American statesmen and other men of affairs. It is intended to cover the entire field of American history. The object is to emphasize the personal element in our national development and to become more familiar with the leaders of our economic progress. Students desiring to place especial stress upon any feature of the study may elect not to exceed 20 percent of their allotment of biographical research. (Lectures, assigned reading, and discussion.)

Elective; junior or senior year; first semester; 3 credits; 3 recitations.

110. History of South America. This course includes the history of South America, Central America, and Mexico; hence comprises the discovery, colonization and growth of Latin America. Although the dramatic story of our southern neighbors reads like a romance, the course is designed primarily to meet the requirements of Americans who desire to cultivate deeper interest in our sister republics through a broader knowledge of their political and economic development.

Elective; 3 credits; 3 recitations.

D. United States History. With special attention to the colonial, political, and industrial aspects. A brief course that covers the leading events of our history. Particularly important in Oregon since the introduction of direct legislation and equal suffrage.

Two-years Business course; first year; second semester; 3 credits; 3 recitations. Text: Muzzey, American History.

INDUSTRIAL EDUCATION

EDWIN DEVORE RESSLER, Professor
HELEN BRYCE BROOKS, Professor of Domestic Art
AVA BERTHA MILAM, Professor of Domestic Science
FRANK HENRY SHEPHERD, Assistant Professor
HERBERT TOWNSEND VANCE, Assistant Professor of Stenography and Office Training.
JESSE FRANKLIN BRUMBAUGH, Assistant Professor

The department of Industrial Education offers courses for the preparation of teachers in the subjects of Agriculture, Home Economics, Commerce, and Manual Training. The importance of providing special instruction in the industries for the pupils of the public schools is fully recognized. The material equipment in the way of laboratories, workshops, experimental fields, etc., is easily secured. Specially trained teachers cannot be prepared overnight. There is a real danger that the public will underestimate the scientific and educational significance of the new education. The industrial branches cannot be taught from textbooks nor by teachers without technical training.

There must be special supervisors in each of the industrial branches for the larger schools, where instruction is given to a large number of pupils under both trained and untrained teachers. Supervisors, who will do some regular teaching, are also required where a number of small town and country districts are grouped for industrial instruction. In time, we may expect the grade teachers to have secured through the high and normal schools the technical training that will enable them to teach the industrial branches under direction. Until that time, most of the teaching must be done by the special instructor.

The department of Industrial Education gives the professional training and advises with the students and deans of the various schools in the selection of the technical courses. In conjunction with the other departments concerned, tentative courses of study are prepared in each of the industrial branches, adapted to the age of the pupils and the social demands on the school. The department undertakes to assist teachers in the work of instruction, by general and special suggestions through college and other publications, and by correspondence and visitation. Detailed lists of equipment and apparatus, with cost, suitable for small and large schools, will be furnished on request.

Students electing this course will be registered in the school in which their distinctive subject is given. Thus those who desire to prepare to teach and supervise Agriculture in the high school

and grammar grades will be registered in the School of Agriculture and will receive their degrees in Agriculture on completion of the requirements.

In the same way students desiring to prepare to teach Home Economics and Commerce will be registered in the schools of Home Economics and Commerce. A special degree course in Industrial Arts, described under that heading, has been organized for the preparation of teachers of Manual Training.

Students are advised to consider carefully the selection of teaching as a vocation. Good scholarship, and the ability to speak, spell and write the mother tongue correctly are fundamental essentials. Personality, altruism, enthusiasm, professional aptitude, and above all, moral character, are demanded of the teacher. Positions cannot be guaranteed and none but capable candidates will be recommended.

The Oregon School Law grants a high school teaching certificate to graduates who have taken 15 credits in education. These courses should be taken during the junior and senior years. Students should note the prerequisites as shown below.

The following courses are offered:

101. General Psychology. A study of general psychology by lectures, recitations, and reports; a description of the facts and laws of mental activities with applications to the ordinary affairs of life; demonstrations and experiments showing the relation of mental life to the nervous system; the significance of habit in conduct and character.

Required of all students preparing to teach. Junior year; either semester; 3 credits; 2 recitations; 1 laboratory period.

102. Educational Psychology. The application of the facts and principles of psychology to teaching; a study of the growth of the child mind and the relations of the various periods of educational organization; adaptation of courses of instruction, methods of teaching, discipline, and general school activities to the stages of the pupil's development; lectures, recitations, reports, and simple investigations.

Prerequisite: Ind. Ed. 101. Required of all students preparing to teach. Junior year, second semester; or senior year, first semester; 2 credits; 1 recitation; 1 laboratory period.

120. History of Education. A general review of the growth and development of education and its relation to the civilization of the times; particular attention given to the rise of industrial educa-

tion in Europe and America, and its place in the social and political life of the country.

Sophomore or junior year; either semester; 3 credits; 3 recitations.

125. History and Theory of Vocational Education. Arranged to meet the needs of those preparing to teach any phase of vocational education. Emphasis placed on the present day literature of the subject. History of vocational education; its function in a system of education; development in the United States; present status; attitude of organized labor; demands of manufacturers; rights of society; legislation in different states. Lectures, assigned readings, oral and written reports.

Elective in junior or senior year; first semester; 2 credits; 2 recitations.

132. Principles of Education. An introduction to the study of education, including a discussion of the meaning of education, its significance in the development of the race, its aims, its method, its functions; brief description of present foreign systems and a fuller account of our own; organization of the school, relations and duties of pupils, teachers, supervisors and school boards; problems of school management; conduct of classes and general method; all with particular reference to the special, industrial teacher.

Required of all students preparing to teach; junior year; either semester; 3 credits; 3 recitations.

135. Vocational Guidance. An investigation of the means and methods of assisting the pupils of the upper grammar grades and high school in studying the problem of their future vocations. Factors of individual aptitude, heredity and other personal characteristics; means of discovering these factors through school and other agencies; studies of occupations with essential qualifications for success in leading types; value of "life career" motive in education; survey of state and local resources as guides to choice, etc.

Lectures, reports on the extensive literature of vocational guidance and some practical experience with pupils, under the careful supervision of the instructor.

Elective for juniors and seniors; second semester; 2 credits; 2 recitations.

152. Special Method in Agriculture. A careful, detailed study of the public school course in Agriculture, in its various relations, including the other subjects in the curriculum, preparation for college, farming, community life, etc. Model courses for both elementary and secondary grades are constructed with plans for

all desired equipment for laboratory, library, field work, including cost. Lesson plans on typical subjects, observation and model lessons, practice teaching, and extension work with school children and adults, provide additional opportunities to enable the students to reduce theory to practice.

Prerequisites: Ind. Ed. 101, 132. Required of students majoring in Agriculture for teachers. Junior year, second semester; or senior year, first semester; 2 credits; 2 recitations.

154. Special Method in Agriculture. Continuation of course 152.

Prerequisites: Ind. Ed. 101, 132, 152. Required of seniors majoring in Agriculture for teachers; senior year; either semester; 3 credits; 1 recitation; practice teaching.

164. Special Method in Domestic Art. Same as course 152, applied to the public school course in Domestic Art.

Prerequisites: Ind. Ed. 101, 132. Required of students preparing to teach Domestic Art. Junior year, second semester; or senior year, first semester; 2 credits; 2 recitations; 1 laboratory period. Fee \$0.50.

165. Special Method in Domestic Science. Same as course 152, applied to public school course in Domestic Science.

Prerequisites: Ind. Ed. 101, 132. Required of students preparing to teach Domestic Science; junior year, second semester; or senior year, first semester; 2 credits; 2 recitations; 1 laboratory period. Fee \$1.50.

166. Special Method in Domestic Art. Continuation of course 164.

Prerequisites: Ind. Ed. 101, 132, 164. Required of students preparing to teach Domestic Art; senior year; either semester; 3 credits; 2 recitations; practice teaching. Fee \$0.50.

167. Special Method in Domestic Science. Continuation of course 165.

Prerequisites: Ind. Ed. 101, 132, 165. Required of students preparing to teach Domestic Science; senior year; either semester; 3 credits; 2 recitations; practice teaching. Fee \$1.50.

172. Special Method in Manual Training. Same as course 152, applied to the public school course in Manual Training.

Prerequisites: Ind. Ed. 101, 132. Industrial Arts; junior year, second semester; or senior year, first semester; 2 credits; 2 recitations.

174. Special Method in Manual Training. Continuation of course 172.

Prerequisites: Ind. Ed. 101, 132, 172. Industrial Arts; senior year; first or second semester; 3 credits; 1 recitation; practice teaching.

174. Theory and Practice of Elementary Manual Arts. A course for supervisors who must arrange courses and supervise Industrial Arts in the lower grades. Investigation of the present trend of the manual arts movement; arrangement of a suggestive course of study; plan of equipment; ordering of supplies; etc.; sand table projects, rug weaving, paper folding, thin wood work, and other forms of construction work for the first six grades of the elementary school. Lectures, assigned reading, reports and practical shop work.

Required in Industrial Arts; elective in other courses; junior or senior year; either semester; 2 credits; 1 recitation; 1 laboratory period.

180. Special Method in Commerce. Same as course 152, applied to the public school course in Commerce.

Prerequisites: Com. 102, 402, 412; Ind. Ed. 101, 132. Required of students preparing to teach Commercial branches; senior year; first semester; 2 credits; 2 recitations.

182. Special Method in Commerce. Continuation of course 180.

Prerequisites: Com. 102, 402, 412; Ind. Ed. 101, 132, 180. Senior year; second semester; 3 credits; 1 recitation; practice teaching.

190. School Administration. A discussion and analysis of the American system of education, with an interpretation of the purpose and spirit of each division; problems of administration and teaching in the public schools; the correlation of the industrial branches with the other subjects in the curriculum. Lectures, reading, reports, and studies on the Oregon schools.

Prerequisites: Ind. Ed. 101, 132. Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

191. School Hygiene. A course in the health provisions requisite for the hygienic conduct of education. This includes a discussion of ventilation, heating, light, seating, physical exercise in the school room and on the playground, games, medical inspection, tests for physical defects, disinfection, quarantine, and other similar topics. Oregon laws relating to these matters will be studied, and the regulations of the State Board of Health and other State and local health authorities will be explained in detail. Advanced

investigations in other states will also be presented and comparative studies made. Lectures, reports, and first-hand investigations on town and country school conditions, so far as practicable.

Prerequisites: Ind. Ed. 101, 132. Elective for advanced or graduate students; first semester; 2 credits; 2 recitations.

192. Child Study. This includes the physical and mental characteristics of children and youth as contrasted with those of mature men and women. The relation of physical growth and development to the unfolding of mental powers; the instincts and their relation to the development of individuality, sense of responsibility to others, moral development, etc.; abnormalities; study and treatment of children as individuals and in class groups; and discussion of the social and economic implications as well as the psychological. Lectures, reports, and simple tests and records made by visitation of schools.

Prerequisites: Ind. Ed. 101, 102, 132. Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

200. Research. Advanced or graduate students who are qualified by previous training or experience, may register for extended investigation of some specific problem in industrial education. The studies may be historical, either European or American; administrative; or in the field of method. General government and state reports; publications by special commissions; reports of committees of educational organizations; contributions by departments of colleges and universities; educational and other periodicals; and original investigations into Oregon conditions, compose the material to be used. These studies will be assigned and outlined by the instructor and stated reports made from time to time by the student. Regular hours will be assigned the individual students and credit given according to the amount of work done.

Prerequisites: Ind. Ed. 101, 132. Elective for advanced or graduate students; first semester; 2 credits.

201. Research. Continuation of course 200.

Prerequisites: Ind. Ed. 101, 132, 200. Elective for advanced or graduate students; second semester; 2 credits.

202. Research. As outlined in course 200.

Prerequisites: Ind. Ed. 101, 132. Elective for advanced or graduate students; first semester; 4 credits.

203. Research. Continuation of course 202.

Prerequisites: Ind. Ed. 101, 132, 202. Elective for advanced or graduate students; second semester; 4 credits.

LIBRARY

IDA ANGELINE KIDDER, Librarian
LUCY MAY LEWIS, Assistant Librarian
LILLIAN MABEL GEORGE, In charge Continuations Dept.
BERTHA HERSE, In charge Circulation Dept.
LILA GRACE DOBELL, Assistant
BLANCHE MARIE CLAUSMEYER, Assistant
ETHEL ALLEN, Assistant

Equipment. The Library occupies the second floor of the Administration building and one room on the first floor. The reading and general reference room is large, well lighted, and extends entirely across the building. It is supplied with about six hundred leading magazines and newspapers. Through the courtesy of the editors, a large number of farm, orchard, stock, and home journals, and country newspapers of Oregon are received regularly at the reading room. The book stacks, occupying adjacent rooms, contain 30,000 volumes of standard work of history, biography, engineering, agriculture, natural science, general literature and reference, and about 3000 reports and other publications from the Agricultural Colleges and Experiment Stations of all the states, with 50,000 bulletins and pamphlets. The library is a designated depository of United States Government publications, of which it has about 7,000 volumes. Over 2,000 of these were received as a gift from the library of the late United States Senator Dolph.

Practical use of the books has led to the establishment of small laboratory collections kept in the rooms of the following departments: General Chemistry, Agricultural Chemistry, Animal Husbandry, Agronomy, Horticulture, Botany, Forestry, Bacteriology, Zoology, Pharmacy, Commerce, and Civil, Mechanical, Electrical, and Mining Engineering. Each department library is in charge of the head of that department, to whom application must be made for the use of the books.

All books are classified and catalogued according to the Dewey decimal system. Books may be drawn for home use by all officers and students of the College. Books may be kept by the students for two weeks with the privilege of a renewal, and by officers for any reasonable time. All students have free access to the shelves of the library.

The reference library in the reading room consists of encyclopedias, dictionaries, standard reference books in the different departments of study, together with books designated by professors for collateral reading in the various courses of instruction. A

small collection of books for cultural reading is also kept in the reading room. In the same room, and accessible to all readers, is the card catalogue of the general library, including the books of the department libraries. The catalogue includes both authors and subjects under one alphabet on the dictionary plan; there is also a card catalogue of the publications of the U. S. Department of Agriculture, and a card index to the publications of the State Experiment Stations.

1. Library Practice. This course teaches, by means of lectures and practical problems, the use of catalogues, indexes, and reference books, such as dictionaries, encyclopedias, atlases, handbooks of general information, handbooks of history, statistics, quotations, etc.

All degree courses; freshman year; one semester; $\frac{1}{2}$ credit; 1 lecture; 1 recitation; 1 laboratory period each alternate week.

MATHEMATICS

CHARLES LESLIE JOHNSON, Professor
EDWARD BENJAMIN BEATY, Associate Professor
NICHOLAS TARTAR, Assistant Professor
HARRY LYNDEN BEARD, Instructor

The following courses are offered:

8. Commercial Mathematics. An advanced course in commercial arithmetic, especially for students in the School of Commerce. To do successful work in this course, the student should have a thorough knowledge of all the fundamental operations of arithmetic, including the various phases of percentage and interest. Emphasis is laid on computations of the more difficult problems connected with partnership and corporation settlements, balance sheets and statements, equation of accounts, partial payments, savings bank accounts, compound interest, stocks and bonds, life insurance, and annuities, partly for the information obtained in the various subjects and partly for the drill afforded in the use of figures. Daily drills are given in short methods and rapid calculation.

The course in Commerce; freshman year; first semester; 3 credits; 3 recitations. Text: Van Tuyl, Complete Business Arithmetic.

11. Plane Trigonometry. This course includes functions of acute angles, right angles, functions of any angle, relations between functions, inverse functions, trigonometric equations, and oblique triangles. Considerable time is devoted to the deduction of trigonometric formulae, study of trigonometric identities, and the solution of practical problems.

All Engineering courses; freshman year; first three-fifths first semester; 3 credits; 5 recitations. Text: Wentworth and Smith, Plane Trigonometry.

12. Plane Trigonometry. The course in Industrial Arts, second semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Trigonometry.

14. Trigonometry. A review of algebra, including logarithms, is followed by a course similar in character to 11, except that more time is given to the solution of practical problems.

The course in Forestry; freshman year; first semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Trigonometry.

15. Spherical Trigonometry. The courses in Highway and Irrigation Engineering; freshman year; first semester; one credit;

one recitation. Text: Wentworth and Smith, Spherical Trigonometry.

21. College Algebra. After a brief review of radical expressions, theory of indices, and quadratic equations, graphical representation and mathematical induction are studied.

All Engineering courses; freshman year; last two-fifths of first semester; 2 credits; 5 recitations. Text: Hawkes, Advanced Algebra.

22. Algebra. A course for freshmen in Engineering who show by poor work in courses 11 or 21 that they need further preparation in algebra before continuing their mathematics.

All Engineering courses; freshman year; second semester; 5 credits; 5 recitations. Text: Hawkes, Luby, and Touton, Second Course in Algebra.

25. Practical Agricultural Mathematics. A course on the essentials of Advanced Arithmetic and Trigonometry. The Arithmetic includes a thorough drill in both common and decimal fractions; proportion; percentage, embracing interest, partial payments, discount, etc.; mensuration, including problems necessary for an agriculturist. The Trigonometry includes use and application of logarithms, the solving of problems in both right and oblique triangles, finding angles, distances, areas, etc.

The course in Agriculture; freshman year; either semester; 3 credits; 3 recitations.

31. Elementary Analysis. Under College Algebra are treated the binominal theorem, progressions, complex numbers, and the theory of equations. In analytical geometry the point, straight line, circle, conic sections, and some of the higher plane curves are studied. Considerable time is given to the plotting of curves in both rectangular and polar coordinates.

All Engineering courses; freshman year; second semester; 5 credits; 5 recitations.

34. Elementary Analysis. This course is similar to 31, but shorter. Particular emphasis is given to curve plotting in both rectangular and polar coordinates.

The course in Forestry; freshman year; second semester; 3 credits; 4 recitations. Text: Granville and Smith, Elementary Analysis.

41. Plane Analytic Geometry. Course 41 is offered to students who enter the sophomore year deficient in Analytic Geometry. The topics studied are the point, the straight line, polar coordinates,

transformation of coordinates, the circle, conic sections, tangents, diameter, poles and polars, discussions of general equations of the second degree, problems in loci, and higher plane curves.

All Engineering courses; sophomore year; first semester; 3 credits; 3 recitations.

51. Differential Calculus. Among the subjects presented are: differentiation and applications, evaluation of indeterminate forms, expansion of functions, Taylor's and Maclaurin's theorems, maxima and minima, points of inflection, curvature, change of independent variable, functions of two or more variables, asymptotes, curve tracing, etc.

All Engineering courses; sophomore year. Elective for juniors and seniors in other courses; first semester; 4 credits; 5 recitations. Text: Granville, Differential and Integral Calculus.

52. Integral Calculus. Among the topics considered are: direct integration, definite integrals and applications; integration by parts, integration of trigonometric forms, etc.; applications to finding of lengths and areas of curves, surfaces, and volumes of solids of revolution, etc.; double and triple integration and applications. In this course, as in course 51, great stress is laid upon practical applications, and a large number of practical problems are solved.

All Engineering courses; sophomore year. Elective for juniors and seniors in other courses; second semester; 4 credits; 5 recitations. Text: Granville, Differential and Integral Calculus.

61. Differential Equations. A study of the solution of ordinary and partial differential equations which the Engineering student is likely to encounter.

Prerequisites: Courses 51, 52. Elective; junior year; first semester; 3 credits; 3 recitations. Text: Campbell, Differential Equations.

71. Method of Least Squares.

Prerequisites: Courses 51, 52. Elective; junior year; second semester; 2 credits; 2 recitations. Text: Merriman, Method of Least Squares.

81. Hyperbolic Functions.

Prerequisites: Courses 51, 52, 61. Elective; junior or senior years; second semester; 2 credits; 2 recitations. Text: McMahon, Hyperbolic Functions.

A. Algebra. The work of the course includes a drill in the fundamental operations, use of parentheses, special rules of multi-

plication and division, factoring, highest common factor, lowest common multiple, and fractions.

The Mechanic Arts course; first year; first semester; 5 credits; 5 recitations. Text: Hawkes, Luby, and Touton, First Course in Algebra.

B. Algebra. The topics studied are solution of fractional and literal equations, problems involving linear equations, simultaneous linear equations, involving two or more unknown numbers, problems involving simultaneous linear equations, graphical representation, inequalities, involution, evolution, theory of exponents, radical expression, and imaginary numbers.

The Mechanic Arts course; first year; second semester; 5 credits; 5 recitations. Text: Hawkes, Luby, and Touton, First Course in Algebra.

C. Algebra. Required of freshmen who enter with but one year of Algebra.

Either semester; 3 credits; 3 recitations. Text: Hawkes, Luby, and Touton, First Course in Algebra.

D. Plane Geometry. Course D includes the first two books of Plane Geometry. The constant aim is to develop in the student the power of logical reasoning, and of clearness and accuracy of expression. To this end, many original exercises are studied, and at all times demonstrations and proofs are freely discussed in the class room. Required of freshmen entering deficient in first semester of Plane Geometry.

First semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Geometry.

E. Plane and Solid Geometry. A continuation of course D, arranged for freshmen in Engineering who enter deficient in the second semester of Plane Geometry.

Second semester; 5 credits; 5 recitations. Text: Wentworth and Smith, Plane and Solid Geometry.

F. Solid Geometry. Required of all Engineering freshmen who are deficient in Solid Geometry.

Freshman year; first semester; 2 credits; 3 recitations. Text: Wentworth and Smith, Solid Geometry.

G. Plane Geometry. Courses G and H are arranged for freshmen who enter deficient in the second semester of Plane Geometry, and who desire to use both semesters to make up the condition. The two courses are equivalent to course K.

Freshman year; first semester; $1\frac{1}{2}$ credits; 2 recitations. Text: Wentworth and Smith, Plane Geometry.

H. Plane Geometry. A continuation of course G

Freshman year; second semester; $1\frac{1}{2}$ credits; 2 recitations. Text: Wentworth and Smith, Plane Geometry.

K. Plane Geometry. A continuation of course D, covering the last three books of Plane Geometry. Many original exercises are studied. Required of freshmen, except those in Engineering, who enter deficient in second semester of Plane Geometry

Second semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Geometry.

L. Plane Geometry. A course arranged to meet the needs of students in Mechanic Arts.

The course in Mechanic Arts; second year; second semester; 4 credits; 5 recitations. Text: Wentworth and Smith, Plane Geometry.

M. Commercial Arithmetic. A review of all the essential operations. Special stress is laid on short methods; daily drills in rapid calculation; computation of estimates; partnership settlements, etc.

The two-years Business course; first year; first semester; 3 credits; 5 recitations. Text: Van Tuyl, Essentials of Business Arithmetic.

N. Commercial Arithmetic. A continuation of course M.

The two-years Business course; first year; second semester; 3 credits; 5 recitations; Text: Van Tuyl, Essentials of Business Arithmetic.

O. Shop Arithmetic. A thorough drill in the principles of arithmetic, with special application to shop problems of all sorts.

The course in Mechanic Arts; second year; first semester; 4 credits; 5 recitations. Text: Bolton, Shop Mathematics.

R. Farm Arithmetic. An elective course for students in the vocational course in Agriculture who feel the need of a review of arithmetic. A practical text dealing with problems of the farm will be used.

The vocational course in Agriculture; second semester; 3 credits; 3 recitations. Text: Burkett and Swartzel, Farm Arithmetic.

T. Geometry and Trigonometry.

The course in Mechanic Arts; third year; first semester; 4 credits; 5 recitations.

MILITARY SCIENCE AND TACTICS

VERNON A. CALDWELL, Lieutenant-Colonel, Infantry, U. S. Army, Commandant, Professor of Military Science and Tactics.

RONALD DeVORE JOHNSON, First Lieutenant, Cavalry, U. S. Army, Assistant Commandant, Assistant Professor of Military Science and Tactics.

CYRUS FRANKLIN DUGGER, Post Commissary Sergeant, U. S. Army, Retired, Assistant Commandant, Post Adjutant.

DENIS HAYES, Regimental Sergeant Major, U. S. Army, Retired, Assistant Commandant, Post Quartermaster.

The General Government founded Agricultural and Mechanical Colleges to meet the conditions of both peace and war. The education of the citizen, indeed, to be complete, requires him to be trained for both peace and war. In putting this into practice the General Government has acted on the theory that a college training is a military asset, that college men are training themselves for leadership, and that the training at Agricultural and Mechanical Colleges coordinates closely with military training. The cadet is taught that military training is both mental and physical. That mental military training is: first, to determine the objective; second, to analyze, organize, and systematize action by putting in practice the Five General Tactical Principles that state what lines of action must be followed in gaining any objective, either in peace or war; third, to study and think out the methods — technical or otherwise — that best put into practice the lines of action laid down in the Five General Principles. The mental habits thus formed are as necessary in peace as in war and in this way military training coordinates with and is helpful to the training in other courses. Discipline is based on control; control is based on training; training is based on team work. The cadet is taught that acts of authority as well as acts of obedience are acts to promote team work. This impersonal teaching is of utmost value to the cadet, teaching him that authority has no arrogance and that obedience is not servility. The greater part of the cadets' life will be passed in obeying, or commanding, so this training is for every-day use. The cadet is taught that a poor physical appearance comes from, or is caused by, a poorly or improperly developed physique. Military service has always required a good all-round physique and so from the first military training has been designed to develop and better the physical condition.

The objective of the military course is to train the cadet to be able to perform the duties of an officer in enlisting, feeding, equipping, caring for, drilling, and training a company. His ability as a tactical instructor is the most important factor.

The College, conforming to the spirit of law, has provided an efficient system of military instruction for training cadets to become officers. The Congressional Land Grant Act of 1862 requiring military instruction, was passed during a critical period in the life of the Nation while it was engaged in a civil war. The best of evidence was then at hand showing the need of trained officers for citizen soldiers. The object of the law, therefore, was to provide well-trained officers for citizen soldiers.

The military body of this College consists of one regiment of infantry, a hospital corps, signal corps detachment, and a band of fifty instruments. The drill training and administration are about the same as for officers in the Regular Army.

Instruction in the course is prescribed for all undergraduate male students. The instruction is both practical and theoretical.

The new armory contains a drill room 120x300 feet in extent, ample office room, and suitable rooms for storage of guns and other ordnance.

Eight hundred and forty U. S. magazine rifles, with equipment and ammunition, are furnished by the U. S. Government. Other necessary accoutrements and apparatus for the thorough equipment of the military department are furnished by the College, or the U. S. Government.

Appointment and promotion of officers and non-commissioned officers, and their relative rank in each grade, are determined according to the military standing of the cadets, based upon a careful consideration of the following points: knowledge of drill and other duties, practical application of this knowledge on the drill field, and recommendations of superior officers; zeal, soldierly bearing, and aptitude for command; character; military record; general standing in College.

Commissioned officers are selected from the senior class or from such students as have had three or more years of drill; Sergeants from seniors or juniors, or cadets having two or more years drill; Corporal from juniors or sophomores, or cadets having had one or more years drill. All appointments and promotions of commissioned officers are made by the Commandant, with the approval of the President of the College.

Work in military drill is required of all male students of the institution, including all regular degree students, and all vocational, special, and optional students, except short course Forestry students, four periods a week throughout their undergraduate

course. Senior privates may, however, upon petition approved by the President of the College, be excused.

One credit a semester is allowed for military drill, and grades are reported at the end of each semester the same as in any other subject.

Students physically unable to participate in the regular military drill may be assigned by the Commandant to light duty in the department.

Persons transferring to the Oregon Agricultural College with advanced credits from other educational institutions of equal rank will not be exempt from the military requirements, but will be required to offer an equivalent of credits for the back military credits represented or accumulated.

Persons presenting credentials for military work taken at other educational institutions, or for service in the U. S. Army, may be given credit for such work in so far as it is deemed equivalent to the requirements of this institution.

If for any reason a student is relieved from the military requirements, except as specified above, other credits must be substituted therefor.

Paragraph 24, General Orders No. 70, War Department, November 18, 1913, directs that, "Upon occasions of Military Ceremony, in the execution of drills, guard duty, and when students are receiving any other practical military instruction, they shall appear in the uniform prescribed by the institution. They shall be held strictly accountable for the arms and accoutrements issued to them."

The Commandant has general charge of all matters pertaining to the uniform at all times. The uniform complete, including the regulation tan shoes, costs about \$14.50, (students enrolling in the Reserve Officers' Training Corps are uniformed free by the Government), it is of the regulation olive-drab color adopted by the United States Army, and makes a very neat and serviceable suit. It consists of an olive-drab cap with ornament, an olive-drab blouse with collar ornaments, a pair of olive-drab breeches, a pair of canvas puttee leggings of the new design, a pair of olive-drab gloves, a pair of tan shoes, and an olive-drab shirt. It is not advisable to purchase any of these articles before entering College, as the necessary uniformity in style, material, etc., makes it necessary to insist upon articles that conform to the standard set by the department. All of these articles can be purchased cheaper here than they can at other places on account of special arrangements made.

Students must come prepared to deposit the price of the uniform, for which they will be measured as soon as they learn the position of a soldier.

Proficiency in Military department is a requisite to graduation.

Military Drill 1. Freshman year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 2. Freshman year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 3. Sophomore year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 4. Sophomore year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 5. Junior year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 6. Junior year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 7. Senior year; first semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 8. Senior year; second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 9. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. First semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill 10. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. Second semester; 1 credit; 1 hour of practical drill on each drill day.

Military Drill A. First semester; first year; Vocational course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill B. Second semester; first year; Vocational course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill C. First semester; second year; Vocational course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill D. Second semester; second year; Vocational course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill E. First semester; third year; Vocational course; 1 credit; 1 hour of practical drill on each drill day.

Military Drill F. Second semester; third year; Vocational course; 1 credit; 1 hour of practical drill on each drill day.

Special and optional students will be given credits in military drill as indicated above for undergraduate students. For their first semester's drill work they will be given credits in Military Drill 1. For their second semester's drill work they will be given credit in Military Drill 2. In the following years they will be given credits correspondingly.

THEORETICAL INSTRUCTION

Military Science 1. Junior year; first semester; 1 credit; 1 hour a week, lecture or quiz and tactical problem.

Military Science 2. Junior year; second semester; 1 credit; 1 hour a week, lecture or quiz and tactical problem.

Military Science 3. Elective; senior year; first semester; 1 credit; 1 hour a week on duties pertaining to their office or on tactical problem work.

Military Science 4. Elective; senior year; second semester; 1 credit; 1 hour a week on duties pertaining to their office or on tactical problem work.

The course of training given below is the minimum course for all cadets of the Oregon Agricultural College, except those specializing in some military study or those not physically qualified. It is the Reserve Officers Training Course. Joining the Reserve Officers' Training Corps is optional.

In joining this corps freshmen and sophomores bind themselves to nothing, except proficiency in their year of the course. They are issued, for their military use at the expense of the United States, a complete uniform for which they are responsible.

Juniors and seniors to enter this corps for their years must have completed two academic years of service in this course, (the U. S. has credited this college for the college years 1914-15, and 1915-16, as having been substantially equivalent to the basic course for the Reserve Officers' Training Corps) and have been selected for further training by the President of the institution and by its Professor of military science and tactics, and who have agreed in writing to continue in this corps for the remainder of their course at the institution and to pursue the course in camp training of two summer camps of not over six weeks each as prescribed by the Secretary of War. Cadets so selected and appointed may be furnished by the Government with commutation of rations (about \$10.00 per month) during the remainder of their service in this

corps. For the prescribed summer camps transportation to and from, rations and all necessary expenses are furnished by the U. S. Government free to the cadet. Before being appointed an officer in the Reserve Corps at least one camp must be attended.

COURSE OF TRAINING FOR INFANTRY UNITS OF THE SENIOR DIVISION

Freshmen, Military Art 1 and 2; Sophomores, Military Art 3 and 4; Juniors, Military Art 5 and 6; Seniors, Military Art 7 and 8.

1. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

Physical drill (Manual of Physical Training — Koehler); Infantry drill (U. S. Infantry Drill Regulations), to include the School of the Soldier, Squad and Company, close and extended order. Preliminary instruction sighting position and aiming drills, gallery practice, nomenclature and care of rifle and equipment.

(b) Theoretical. Weight 4.

Theory of target practice, individual and collective (use of landscape targets made up by U. S. Military Disciplinary Barracks, Fort Leavenworth, Kans.); military organization (Tables of Organization); map reading; service of security; personal hygiene.

2. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

Physical drill (Manual of Physical Training — Koehler); Infantry drill (U. S. Infantry Drill Regulations), to include School of Battalion, special attention devoted to fire direction and control; ceremonies; manuals (Part V, Infantry Drill Regulations); bayonet combat; intrenchments (584-595, Infantry Drill Regulations); first-aid instruction; range and gallery practice.

(b) Theoretical. Weight 4.

Lectures, general military policy as shown by military history of United States and military obligations of citizenship; service of information; combat (to be illustrated by small tactical exercises); United States Infantry Drill Regulations, to include School of Company; camp sanitation for small commands.

6. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Same as (a) course 5. Military sketching.

(b) Theoretical. Weight 11.

Minor tactics (continued); map maneuvers. Weight 8.

Elements of international law. Weight 2.

Property accountability; method of obtaining supplies and equipment (Army Regulations). Weight 1.

7. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Duties consistent with rank as cadet officers or noncommissioned officers in connection with the practical work and exercises scheduled for the unit or units. Military sketching.

(b) Theoretical. Weight 11.

Tactical problems, small forces, all arms combined; map maneuvers; court-martial proceedings (Manual for Courts-martial).

International relations of America from discovery to present day; gradual growth of principles of international law embodied in American diplomacy, legislation, and treaties.

Lectures: Psychology of war and kindred subjects.

General principles of strategy only, planned to show the intimate relationship between the statesman and the soldier (not to exceed 5 lectures).

8. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Same as course 7 (a).

(b) Theoretical. Weight 11.

Tactical problems (continued); map maneuvers. (Rifle in war.

Lectures on military history and policy.

MODERN LANGUAGES

LOUIS BACH, Professor
MELISSA MARGARET MARTIN, Instructor
CARL HENNINGER, Instructor

The department of Modern Languages is prepared to offer courses of three years in French, German, and Spanish.

In harmony with all other courses of the College, the final aim of the instruction is practical use for the various spheres of activity and pursuits of life. While the disciplinary and cultural values of language study are duly recognized and emphasized, the predominant purpose, all the time and everywhere, is the development of personal power for social service.

The method of teaching suits the end in view. It is independent, to a great extent, of the text books used, much time being spent on oral drill, and each new point of theory being illustrated by copious examples and conversational exercises. Ear, eye, and tongue are equally trained. The study of grammar, at the same time, is made to serve as a course in applied logic. Learning all about subject, predicate and object, together with their various modifiers, rendering a clear account of the relations that words bear to one another, when put together in sentences, the student necessarily bring order into his reasoning power, substituting definite, fundamental conceptions for vague and hazy fancies. Furthermore, by constantly comparing new words and modes of expression with similar ones in his own language, by applying familiar grammatical principles to a new field of effort, by abundant translating from one idiom into the other, the student is sure to gain a deeper and more comprehensive understanding of modern English than could be obtained in any other way. Appreciation comes through comparison.

A certain amount of specified work in a language is definitely required by some departments. In other departments, German, French, or Spanish may be taken as electives, and when so taken, the student receives full credit for one year's work.

Students who have had two years of high-school German, French, or Spanish, are ready to enter the corresponding second year class in College, one year's work in College being equivalent to two years in the high school. With one year's work in the high school, the student is entitled to enter the second semester of the first year class.

All the courses offered may be taken up at the beginning of either semester.

FRENCH

101. Elementary French. Grammar, oral and written exercises; reading of easy prose.

First semester; 3 credits; 3 recitations.

102. Elementary French. A continuation of course 101.

Prerequisites: Mod. Lang. 101 or one year of high-school French. Second semester; 3 credits; 3 recitations.

103. Intermediate French. Advanced grammar, composition, reading of narrative, description and scientific prose; conversational exercise on all sorts of topics.

Prerequisites: Mod. Lang. 101 and 102, or two years high-school French.

104. Intermediate French. Continued; the same plan of work as course 103.

Prerequisites: Mod. Lang. 101, 102, 103. Second semester; 3 credits; 3 recitations.

107. Advanced French. Selections from the various classes of literature specially suited to the particular needs of the class. Composition and conversational exercises based on the texts in use.

Prerequisites: Mod. Lang. 101, 102, 103, 104. First semester; 2 credits; 2 recitations.

108. Advanced French. Continued on the same plan as course 107.

Prerequisites: Mod. Lang. 101, 102, 103, 104, 107. Second semester; 2 credits; 2 recitations.

GERMAN

201. Elementary German. Grammar, oral and written exercises, reading of easy prose.

First semester; 3 credits; 3 recitations.

202. Elementary German. A continuation of course 201.

Prerequisite: Mod. Lang. 201 or one year high-school German. Second semester; 3 credits; 3 recitations.

203. Intermediate German. Advanced grammar, composition, reading of narrative, descriptive and scientific prose; conversational exercises on all sorts of topics.

Prerequisite: Mod. Lang. 201, 202, or two years high-school German. First semester; 3 credits; 3 recitations.

204. Intermediate German. A continuation of course 203.

Prerequisites: Mod. Lang. 201, 202, 203. Second semester; 3 credits; 3 recitations.

207. Advanced German. Reading of texts from the various classes of literature, composition and conversational exercises on the texts used.

Prerequisites: Mod. Lang. 201, 202, 203, 204. First semester; 2 credits; 2 recitations.

208. Advanced German. A continuation of course 207.

Prerequisites: Mod. Lang. 201, 202, 203, 204, 207. Second semester; 2 credits; 2 recitations.

SPANISH

301. Elementary Spanish. Grammar, oral and written exercises, reading of easy prose.

First semester; 3 credits; 3 recitations.

302. Elementary Spanish. A continuation of course 301.

Prerequisite: Mod. Lang. 301 or one year high-school Spanish. Second semester; 3 credits; 3 recitations.

303. Intermediate Spanish. Advanced grammar; composition; reading of narrative and descriptive texts; conversational exercises on all sorts of topics.

Prerequisites: Mod. Lang. 301, 302, or two years high-school Spanish. First semester; 3 credits; 3 recitations.

304. Intermediate Spanish. A continuation of course 303.

Prerequisites: Mod. Lang. 301, 302, 303. Second semester; 3 credits; 3 recitations.

307. Advanced Spanish. Reading of texts from various classes of literature; composition and conversational exercises based on the texts in use.

Prerequisites: Mod. Lang. 301, 302, 303, 304. First semester; 2 credits; 2 recitations.

308. Advanced Spanish. A continuation of course 307.

Prerequisites: Mod. Lang. 301, 302, 303, 304, 307. Second semester; 2 credits; 2 recitations.

PHYSICAL EDUCATION FOR MEN

ALFRED DAVID BROWNE, Director, Professor of Physical Education

JOSEPH AMOS PIPAL, Professor

JAMES GEORGE ARBUTHNOT, Assistant Professor

THOMAS EVERETT MAY, Instructor

Because physical health determines capacity for efficiently carrying out work which a student prepares for in college, the importance of physical education in the modern educational institution is being emphasized more and more every year. The purpose of this department is:

- (a) To maintain and improve the health of the student.
- (b) To maintain and develop the physical efficiency of the student.
- (c) To provide wholesome physical recreation.
- (d) To develop social and ethical values.

These four aims involve five main lines of activity; namely, (1) Individual Instruction, (2) Intercollegiate Athletics, (3) Intramural Athletics, (4) Gymnasium Classes, and (5) Teachers' Course in Physical Training.

Individual Instruction. This is given in the form of advice based upon the health examination of the student. Health examinations are given during the freshman and sophomore years. The examinations are utilized for the purpose of finding defects whose proper treatment may add to the health efficiency of the student. Advice given at this time is recorded and when a student reports for conference the advice on file is followed up. Students found with remedial physical defects are given special work of such a nature as the condition demands.

Physical Training. All students may elect any one of the three divisions in physical training.

Intercollegiate Athletics. All intercollegiate athletic contests are under the jurisdiction of the Board of Control composed of three members of the faculty, four members of the student body, and one alumnus. The department is responsible to the Board of Control for conducting varsity athletics. Representative teams are organized for baseball, basketball, cross-country running, football, soccer, tennis, track, and wrestling. Participation during the whole season of sport is accepted for one semester credit in physical training.

Intramural Athletics. The division of Intramural Athletics is supervised by a council consisting of the Director of Physical

Education, Colonel of the Cadet Regiments, President of the Student Body, Editor of the Student Barometer, and a representative elected by each group of the Fraternities, Clubs, and Independents.

The department has organized this division so that every student who is physically fit to take part in athletic contests has the opportunity to participate in competitive scheduled sports. "Every O. A. C. man an athlete" is the slogan of the College.

For credit, attendance of two hours each week is required of all freshmen and sophomores who elect this subject. This division includes: **fall sports**; football, soccer, cross country running, field events, swimming, tennis, fall baseball; **winter sports**; basketball, track and field events, wrestling, boxing, hand ball, volley ball, swimming, and advanced gymnastics; **spring sports**; baseball, track and field events, tennis, swimming, and cross country running.

Gymnasium Classes. Individual and class instruction. Students who are unfit (determined by examination and tests) for work in the intercollegiate or intramural divisions, are assigned to the gymnasium classes, in which the students are given work for correcting defects, and for developing physical efficiency and muscular power.

Attendance of two hours each week is required of all freshmen and sophomores assigned to this division.

Teachers' Course in Physical Training. Many students expect to take up the profession of teaching after graduation from college. A general knowledge of the theories of physical education and methods of gymnastics and athletic instruction is often of material assistance in securing important teaching positions.

A special Teacher's Course in Physical Training is therefore offered as a minor in this department. The course is designed for those students who are looking forward to positions as teachers of physical training or as coaches of athletic teams.

The subjects treated are:

Physical Diagnosis.

Organization and Administration, and Physical Department Methods.

Aid to the Injured.

School Hygiene and Sanitation.

Program of Class Room, Gymnasium and Playground Exercise and games.

Methods of teaching: Football, Baseball, Track, Basketball, Wrestling and Advanced Gymnastics.

Equipment. The new Men's Gymnasium, two units of which have been completed, is equipped with all modern gymnastic apparatus and facilities for properly carrying on the work of physical education and recreation. The main floor, 90x150 feet in dimensions, furnishes ample space for the most efficient type of gymnasium and indoor athletic work.

Features of the new gymnasium are: the large floor space providing for three regulation basketball courts, the large lobby for receptions, locker rooms and lockers to accommodate the men students, and shower bath and dressing rooms, rooms for accommodating the varsity and varsity teams. The new east wing provides an auxiliary gymnasium for apparatus work, three hand ball courts, two wrestling and boxing rooms, and one large room for volley ball.

The O. A. C. field for athletics comprises a new quarter-mile track, varsity football field with bleachers for seating eight thousand spectators, one varsity baseball field, and six football, soccer, and baseball fields for intramural athletics.

Four tennis courts are now being constructed and will be completed this spring.

The Armory, one of the largest of its kind in the United States, provides fine facilities for winter training during inclement weather in football, track, baseball, and various other sports. An indoor clay track, banked at the turns, which is but eight laps to the mile, and the extension clay floor space and high dome roof furnish facilities for conducting large winter track and field meets.

The swimming pool in the Y. M. C. A. building is under the direction of the department and is supervised by an instructor.

The Treasurer's receipt for the \$1.50 physical-training fee entitles the holder to registration for full privileges of the department including: health examination, strength tests, locker, use of shower rooms, towels and soap, athletic fields, gymnasium, etc.

COURSES IN PHYSICAL EDUCATION FOR MEN

The following courses are offered:

11. First year Vocational, physical training; first semester; 2 periods; $\frac{1}{2}$ credit.

12. First year Vocational, physical training; second semester; 2 periods; $\frac{1}{2}$ credit.

13. Second year Vocational, physical training; first semester; 2 periods; $\frac{1}{2}$ credit.

14. Second year Vocational, physical training, second semester; 2 periods; $\frac{1}{2}$ credit.

15. Freshman year; physical training; first semester; 2 periods; $\frac{1}{2}$ credit.

16. Freshman year, physical training; second semester; 2 periods; $\frac{1}{2}$ credit.

17. Sophomore year, physical training; first semester; 2 periods; $\frac{1}{2}$ credit.

18. Sophomore year, physical training; second semester; 2 periods; $\frac{1}{2}$ credit.

19. **Hygiene.** This course consists of a series of lectures on personal and impersonal hygiene, sources and modes of infectious diseases, immunity, industrial and occupational diseases, etc.; $\frac{1}{2}$ credit.

21. First semester, Teachers' Course in Physical Training; 1 credit.

22. Second semester, Teachers' Course in Physical Training; 1 credit.

23. First semester, First aid to the injured — Red Cross certificate; 2 periods.

24. Second semester, First aid to the injured — Red Cross certificate; 2 periods.

PHYSICAL EDUCATION FOR WOMEN

MIRIAM THAYER-SEELEY, Professor of Physical Education
for Women.

CHARLOTTE LEWIS NELSON, Instructor

IRENE TELFORD, Instructor

LAURA CAMPBELL, Instructor

Purpose. The aim of this department is to bring each student to her best possible physical condition, and by a careful system of gymnastic training to correct faulty posture, to aid in the formation of habits of hygienic living, to establish a normal condition in the circulatory and respiratory systems, to secure bodily vigor, and to attain a healthy and symmetrical development, rather than the greatest increase in mere muscular power.

Special Corrective and Medical Gymnastics. Students who are shown by their physical examinations to be unfit for the work of the regular classes in gymnastics and sports, or to have physical defects, will be assigned to corrective classes where the work is light and the emphasis is laid on correct breathing and posture, relaxation and rest; or, whenever necessary, students will be given private work in medical or corrective gymnastics according to their individual needs. Thus the physical condition of each student is carefully diagnosed and supervised. The instructors encourage conferences concerning matters of health and personal hygiene and cooperate with the resident physician in all cases.

Requirements. Work in physical education is required of all women four periods a week in all full-years, special, optional, music and vocational courses, regardless of the student's course or classification. One credit a semester is granted for this work. For juniors and seniors who have completed courses 5, 6, 7, and 8, (two years regular work) the courses will be made elective or optional for women who pass a satisfactory physical examination and have a correct posture and carriage. Corrective gymnastics will be prescribed for all others, credit being allowed on the basis indicated above. At least four credits are required in Physical Education toward graduation.

Persons presenting credentials of work in physical education taken elsewhere may be given credit for such work in so far as it is equivalent to the requirements of this institution.

Costumes. In order that the gymnasium costumes be hygienic and uniform, a regulation suit and shoes are required of all students. The shoes, orthopedic, are sold by the local dealers, subject to the approval of the director; price \$3.50. The suits should be ordered at the gymnasium office, immediately upon arrival at the

College. Good second-hand uniforms of outgoing girls will be for sale at about \$4.00, while the new uniforms cost \$5.00.

The Women's Gymnasium is equipped with lockers and dressing rooms and has accommodations for every College woman. A room for corrective gymnastics and a rest room, on the ground floor, are adequately equipped for their respective purposes. In the shower-bath room, hot and cold water is available throughout the year, and free towels are furnished to the students. The floor of the gymnasium is surrounded by a balcony running-track, and a capital playing space is provided for basketball and other indoor games.

The equipment includes horizontal bars, vaulting horses and bucks, parallel bars, swinging rings, traveling rings, Swedish box, stall bars, climbing ropes, ladders, dumb-bells, Indian clubs, and wands.

The girls' athletic field provides facilities for such games as out-door basketball, field hockey, soccer, tennis, baseball, and cross-ball.

All women pay the fee of \$1.50 per semester for which they are given use of all equipment, lockers, baths; are furnished with towels, medical supplies for injuries, and are given first aid, massage and physical examinations.

COURSES IN PHYSICAL EDUCATION FOR WOMEN

The following courses are offered:

A. Required Courses. In the regular courses in Practical Gymnastics a variety of work is taught. Both the Swedish and German systems of gymnastics are used, and the best in both is adapted to the needs of the classes. Much emphasis is laid on correct posture and breathing. During her first two years of college work each student, irrespective of classification, if not required to take corrective gymnastics, must be enrolled in courses 5, 6, 7 and 8, in which the practical work in Physical Education is divided as follows:

Two periods a week in practical gymnastics, plus two periods a week in elective courses. (These may be chosen according to needs or desire of students, from the list of elective courses described below.)

5. Practical Gymnastics (and Electives).

Required of all students; first semester; first year; four hours a week; 1 credit.

6. Practical Gymnastics (and Electives).

Required of all students; second semester; first year; four hours a week; 1 credit. Prerequisite: Course 5.

7. Practical Gymnastics (and Electives).

Required of all students; first semester; second year; four hours a week; 1 credit. Prerequisites: Courses 5 and 6.

8. Practical Gymnastics (and Electives).

Required of all students; second semester; second year; four hours a week; 1 credit. Prerequisites: Courses 5, 6 and 7.

26. Corrective Gymnastics. Special attention is given to those having spinal curvature, round shoulders, narrow chests, forward heads, weak backs, pronated ankles, and other physical defects or weaknesses.

Required of all students who have need of remedial work.

10. Hygiene.

Required of all freshmen. One lecture a week; $\frac{1}{2}$ credit.

B. Elective Courses.**I. Practice**

Credit in these elective courses is given according to the number of periods taken each week, $\frac{1}{4}$ credit being given for each period.

27. Outdoor Sports. Soccer, playground ball, cross ball, base crick, track athletics, etc. Open to all students.

28. Basket Ball. Open to all students physically qualified.

29. Soccer. Open to all students.

30. Baseball. Open to all students.

31. Indoor Baseball. Open to all students.

32. Hockey. Open to all students.

33. Advanced Gymnastics (and Electives). Open to specials in Physical Education and, by permission, to such other students as are qualified.

Prerequisites: Courses 5, 6, 7, and 8.

34. Tennis. Open to all students.

35. Swimming. Open to all students.

36. Fencing. Open to all students who have satisfactorily completed courses 5 and 6.

37. Indian Clubs. Open to all students.

38. Aesthetic Dancing. (Elementary.) Open to all students. The purpose of this course is to develop grace and freedom of movement. Greek dancing, now considered one of the most important phases of gymnastic exercise, is emphasized.

39. Aesthetic Dancing. (Intermediate.) Open to all students who have completed course 38.

40. Folk Dancing. Open to all students. In this course are taught a variety of peasant and national dances suitable for recreation or teaching.

44. Archery. Open to all students.

II. Theory

41, 42. Theory of Gymnastics. (Open to students who contemplate teaching gymnastics.) Lectures, recitation and practice teaching. (School hygiene is included in this course.)

Two periods a week; 41 first semester, 42 second semester; 2 credits each semester.

43. Play and Playground Games. Open to all Summer School students.

Five periods a week for summer session; 2 credits.

This course is designed for public school teachers or students interested in playground work, or wishing to specialize in Physical Education. The psychology of play, adaptation of play to varying ages, necessity of supervision of play, simple equipment for school playgrounds, organization of games, will be given briefly. The greater part of the time, however, will be given to the practice of various playground games and simple folk dances.

45. History of Physical Education. This is planned for students specializing in Physical Education and is supplementary to the History of Education.

1 credit; 1 semester.

47, 48. Massage. Theory and practice.

One lecture; one laboratory period; 1 credit each semester; 47 first semester, 48 second semester. Prerequisites: Anatomy and Physiology.

57, 58. Massage and Medical Gymnastics. Practical work in Corrective Clinic.

Prerequisites: Courses 47 and 48. Three periods a week; 1 credit each semester; 57 first semester, 58 second semester.

49, 50. Physical Examination and Prescription of Exercises. Open to students specializing in Physical Education. (Personal and Sex Hygiene are included in this course.)

One lecture; one laboratory period; 1 credit each semester; 49 first semester, 50 second semester. Prerequisites: Anatomy and Physiology.

51, 52. Methods and Practice Teaching. Open to students specializing in Physical Education.

Lectures, recitations, and teaching.

Prerequisites: Courses 41 and 42. Two periods a week; 2 credits each semester; 53 first semester, 54 second semester.

61, 62. Special Methods in Physical Education. Lectures, recitations, and advanced teaching.

Prerequisites: Courses 41, 42, 51, 52. Two periods a week; 2 credits each semester; 61 first semester, 62 second semester.

53, 54. Organization and Administration of Playgrounds. Open to students desiring to teach Physical Education.

Two periods a week; 2 credits each semester; 53 first semester, 54 second semester.

SPECIAL WORK IN PHYSICAL EDUCATION

An arrangement of courses will be made for women desiring to specialize in Physical Education as a minor, either with the purpose of teaching it in connection with their Home Economics or other courses in the schools of the State; or with the desire of securing a thorough foundation for continuation of this line of study.

There are two distinct kinds of courses necessary for the special study of Physical Education: I. Theory; II. Practice.

I. Theory

High-school preparation advised: Physiology, Physics, Chemistry, Latin, German.

College courses recommended: Zoology (101, 102), Physiology and Anatomy (201, 202), English (31, 32), Expression (206, 207), German (three years, or a knowledge sufficient to study scientific and medical works), Theory of Gymnastics (41, 42), Embryology and Histology (104, 105), Neuro-Physiology (209), General Psychology (101), Educational Psychology (102), Dramatic Interpretation (208, 209), Story Telling (191, 192), American Literature (71, 72), Home Nursing (511), Massage (47, 48), Physical Examination and Prescription (49, 50), Organization and Administration of Playgrounds (53, 54), Basketry, Methods and Practice Teaching (Phys. Ed. 51, 52), Sociology (250), Education (131).

II. Practice

Practical Gymnastics (5, 6, 7, 8), Advanced Gymnastics (33), Corrective Gymnastics (26), Aesthetic and Folk Dancing (Elementary and Advanced), Fencing (Elementary and Advanced), Swimming (Elementary and Advanced), Archery, Sports of all kinds.

PHYSICS

WILLIAM BALLANTYNE ANDERSON, Professor
WILLIAM ALFRED BEVAN, Assistant Professor
GILBERT BRUCE BLAIR, Instructor
JOHN HARRISON BELKNAP, Instructor

An endeavor is made to adapt each course to the needs of those taking it. The Engineering students use a text which seems to be the best available for their needs; while the text used by the Agricultural students was written especially for such students. The "Physics of the Household" was likewise written especially for students of Home Economics.

In all courses the practical side of the subject is emphasized both in lecture and in laboratory work. At the same time the theory of the subject, in so far as it deals with the fundamental principles of Physics, receives the attention that its importance demands.

Since Physics and Chemistry are the two basic sciences, it would seem that every College graduate should have had at least a general course in each of these subjects. The department, accordingly, urges that at least all College students who have not had Physics in high school elect some work in Physics after consultation with the head of the Department of Physics. Those expecting to teach Physics in the high schools should by all means take several courses in College Physics.

Equipment. The physical laboratory has a good working equipment for the study of general physics, the apparatus being such as to allow a qualitative or quantitative verification of the most important laws of physics by the student in the laboratory, and by the instructor in the lecture room. In addition to the general laboratory, the department has two special laboratories, one equipped for electrical measurements and the other for photometry. A partial list of the apparatus found in these follows: standard cells, shunts, capacities and inductances; secohmeter; Leeds and Northrup potentiometer; Siemens and Halske standard ammeters, voltmeter, and portable testing set; Paul unipivot testing set; storage cells of large current capacity for ammeter and wattmeter calibrations; 10½-inch spark coil; Gaede pump; large Tesla coil; Leeds and Northrup photometer fitted with lamp rotator, rotating sector, Lummer-Brodhum screen, and Bechstein flicker photometer.

In the General Library will be found many recent Physics texts and allied works, as well as several Physics Periodicals, which are available to all.

The following courses are offered:

1. **General Physics.** A course in general physics, descriptive rather than mathematical in character, covering the subjects of mechanics and heat.

Prerequisite: Geometry. The courses in Agriculture and Electrical Engineering; freshman year; the courses in Forestry and in Industrial Arts, sophomore year; elective in the course in Commerce, freshman year; first semester; repeated second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Anderson, Physics, Vol. I.

General Physics. A continuation of course 1 covering the subjects of sound, light, electricity, and magnetism.

Prerequisite: Physics 1. Required as listed under course 1; second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Anderson, Physics, Vol. II.

101. **Engineering Physics.** A course in mechanics and heat.

Prerequisite: Trigonometry. The course in Highway Engineering, Logging Engineering, Mechanical Engineering, and Mining Engineering; sophomore year; first semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period. Fee \$2.00. Text: Reed and Guthe, Physics.

102. **Engineering Physics.** A continuation of course 101, covering the subjects of electricity and magnetism, sound and radiation.

Prerequisite: Physics 101. Sophomore year; second semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period. Fee \$2.00. Text: Reed and Guthe, Physics.

105. **Electrical Physics.** An advanced course in general physics.

Prerequisites: Physics 1 and 2; trigonometry. The course in Electrical Engineering; sophomore year; first semester; 3 credits; 1 lecture; 2 recitations; 1 laboratory period. Fee \$2.00.

106. **Electrical Measurements.** A continuation of course 105, in which the study and use of electrical measurements is emphasized.

Prerequisite: Physics 105. The course in Electrical Engineering; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 1 three-hours laboratory period. Fee \$2.00.

133. **Household Physics.** A brief descriptive course with such applications as are of greatest interest to students in Home Economics extending over subjects of mechanics and heat.

The course in Home Economics; sophomore year; first semester;

2 credits; 1 lecture; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Lynde, Household Physics.

134. Household Physics. A continuation of course 133 and extending over subjects of electricity, light and sound.

The course in Home Economics; sophomore year; second semester; 2 credits; 1 lecture; 1 recitation; 1 laboratory period. Text: Lynde, Household Physics. Fee \$2.00.

201. Electrical and Magnetic Measurements. A laboratory course in the exact determination of electrical and magnetic quantities, calibration of instruments, etc.

The course in Electrical Engineering; junior year; first semester; 2 credits; 1 three-hours laboratory period. The course will be repeated during the second semester, as an elective, should a sufficient number of students apply. Fee \$2.00.

202. Electricity and Magnetism. An advanced course, taking up the theory of electrical measuring instruments, etc., with suitable practice in the laboratory.

Elective; credit to depend on work done. Fee \$2.00.

211. Heat and Light. An advanced course, taking up the phenomena of heat and light in detail, including recent discoveries.

Elective; credit to depend on work done. Fee \$2.00.

220. Descriptive Astronomy. A brief elementary course in astronomy designed to acquaint the student with the most important facts relating to the heavenly bodies. The object of the course is to make the student an intelligent observer of the more common astronomical phenomena. Descriptive rather than mathematical in character.

Elective; second semester; 2 credits; 2 recitations or equivalent in lectures and observation work, depending upon weather conditions.

222. Wireless Telegraphy. A study of electric waves, their measurement, and their application to practical wireless telegraphy.

Prerequisites: Math. 51, 52; E. E. 101. The course in Electrical Engineering; junior or senior year; elective; second semester; 3 credits. Fee \$2.00.

A. Elementary Physics. An elementary or high school course in physics.

The vocational course in Mechanic Arts; third year; first semester; 3 credits; 3 recitations; 1 laboratory period. Fee \$2.00.

B. Elementary Physics. A continuation of course A.

Second semester; 3 credits; 3 recitations; 1 laboratory period. Fee \$2.00.

SUMMER SESSION

The chief purpose of the Summer School is to afford an opportunity for study to those unable to attend during the academic year. The courses are arranged for elementary and secondary teachers interested in Agriculture, Commercial branches, Home Economics and Manual Training; for credit in regular college subjects, as well as for prospective students deficient in entrance credit; for those interested in music and art; and for those desiring practical instruction in agriculture, household economics, and woodwork.

During the session, a two-weeks course in Agriculture and Home Economics is given for boys and girls of the upper grammar grades and high school. Most of those attending are winners of local, county, or state prizes in the School Industrial Club contests. A limited number of boys and girls not prize winners is also admitted. A special bulletin gives particulars.

A large faculty, chiefly regular College instructors, supplemented by a number of specialists from other institutions and from other states, the extensive equipment in class rooms, laboratories, libraries, shops, and experimental fields, are at the service of the students.

RAILROAD RATES

To those attending the summer school, the transportation companies grant a special rate of one and a third fare for the round trip, on the certificate plan. In order to receive the benefit of the reduction, the purchaser must pay full fare to Corvallis, **securing a receipt from the ticket agent** at the time of purchase. This receipt must be countersigned by the College secretary at Corvallis, and on presentation to the ticket agent at Corvallis will secure rate of one-third for the return. This special rate takes effect three or four days before the opening date of the summer session and remains in force until the same length of time after the closing date. Tickets on this plan may be secured at any time while the school is in session, and are also good for return at any time.

ADMISSION AND EXPENSES

There are no entrance examinations or other educational tests for admission. Students desiring College credit must do the required work and pass satisfactory examinations at the close of the session. The registration fee of five dollars entitles the student

to admission to as many courses as he cares to attend during the entire session. Private, individual lessons in music will be given at the regular price charged during the school year; students taking music only, will not pay the College registration fee.

The College dormitories, Waldo for women and Cauthorn for men, will accommodate about three hundred students with board and lodging. A charge of six dollars will be made to cover the cost of heat, light, use of laundry, etc. The rooms are provided with bed, mattress, table, and chairs. Each room has closet, hot and cold water, and electric light. Each student who desires to occupy one of these rooms must bring pillows, pillow-cases, sheets, blankets or comfort, bed-spread, towels, napkins, and soap. The laundry room will be open for the use of students at Waldo Hall without extra charge.

Table board will be furnished at Waldo Hall at four and one-half dollars a week. Lists of private lodging and boarding places will also be provided and every assistance rendered in finding satisfactory accommodations. Furnished rooms for light housekeeping may also be had.

Allowing \$33.00 for board and room, \$5.00 registration fee, and \$1.00 for drayage on baggage, \$11.00 for laundry and incidentals, the minimum cost for the entire six weeks need not exceed \$50.00, exclusive of railroad fare. Those who take courses requiring textbooks and laboratory fees must make some additional allowance.

SOCIAL AND OTHER FEATURES

The informal and recreation diversions from the class and study routine have not only a social but an educational value as well. These are so controlled and directed as to be inexpensive and unobtrusive. Opportunity for students to become acquainted with each other and with the instructors outside the class room may be had each evening at Waldo Hall, during the informal social hour and at the formal receptions and parties each week.

The College numbers among its faculty some of the best known popular lecturers in the State. Several will be heard in illustrated stereopticon addresses on interesting phases of Oregon's industrial development. At least once each week an evening will be given up to entertainment, either in the form of a lecture of general interest, or a musical concert.

The tennis courts, baseball field, gymnasium, and other recreational resources of the institution may be used by the students and

instructors, free of charge. Boating on the Willamette and Mary's rivers, picnics and excursions to various points of interest, including Mary's Peak, and week-end trips to the ocean at Newport, will also be available for those who desire to indulge in these recreations. The social features of the Summer School are given careful attention, so they may not come in conflict with the regular work, but at the same time be full of pleasure and interest.

SPECIAL ILLUSTRATED BULLETIN

Each spring, special circulars are issued, giving complete description of the various courses offered, statement in detail of living and other expenses, list of instructors, directions for registration, and other matters. These bulletins are illustrated with interesting views of the College campus. Copies may be obtained by addressing the Oregon Agricultural College, Corvallis, Oregon.

WINTER SHORT COURSES

For many years the Oregon Agricultural College has offered each winter one or more courses of lectures and demonstrations which have been known as Winter Short Courses. These courses have been so generally successful and have called forth so many expressions of approval from those in attendance, that the work has expanded until several courses are given in each of the following schools:

School of Agriculture.

School of Home Economics.

School of Forestry.

School of Engineering.

School of Commerce.

Each of these courses, except the one in Industrial Arts, which will consist entirely of practical work in the shops or in the draughting room, will consist of a series of lectures supplemented by demonstrations, and by practical exercises in the dairy, the orchard, and the various laboratories. The work is so arranged that each hour of the day, from 8 until 5, may be filled with lectures and laboratory or field demonstrations. The work offered will be adapted to the various needs of farmers, fruit growers, dairy-men, mechanics, or of women in the home.

The various courses are so planned as to provide the largest amount of practical information in the short time available. The subjects to be discussed are those in which every farmer should be interested, and the aim will be to present them in the most practical manner possible. The laboratory and collections, the shops, the creamery, the orchards, the College farm, the cutting, fitting, and sewing rooms; the dining rooms and kitchens—all offer facilities for demonstration or for practical exercises by the students attending these courses. A pleasing and profitable feature of these courses will be a series of lectures by prominent men who are qualified by successful experience to speak upon some particular phase of Agriculture.

Special lessons in Music may be taken by short course students at the regular rates listed under the School of Music.

Students should report to the Registrar for registration and for assignment to the various classes. The inclusive dates of the short courses are as follows: Winter Short Courses, January 7 to February 1; Forestry Short Course, November 5 to April 12.

Special short courses on particular subjects may be announced from time to time. A list of boarding and lodging places may be consulted at the office of the Y. M. C. A.

No entrance examination or other educational test will be required; but no one will be received who is less than sixteen years of age.

There will be no fees whatever for attending the exercises of Farmers' Week. Those who attend the other courses will be expected to pay a registration fee of \$1.00. In addition, students who elect certain courses will be expected to pay small fees, to cover the cost of materials used.

Board and lodging may be had in Corvallis at \$4.50 to \$6.00 a week.

Railroad Rates. The railroad companies grant a rate of one and one-third fare for the round trip on the usual certificate plan.

A circular descriptive of all Short Course work will be issued about November 1, and may be obtained by addressing the Oregon Agricultural College, Corvallis, Oregon.

AGRICULTURE

The School of Agriculture offers to its Short Course students instruction in the following courses; viz., Farm Crops, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Horticulture, and Crop Pests. In addition to these courses, students are advised to take advantage of the courses in Rural Economics which are offered in the School of Commerce, as well as the course in Rural Highways, in the School of Engineering. For more detailed information regarding these courses, write for descriptive circular mentioned above.

COMMERCE

Commercial Lecture Course. To meet the demand for a short, practical business course, the work outlined below will be offered in a series of lectures under the same conditions and entrance requirements as other winter courses.

Bookkeeping. This course will embrace the fundamental principles of double entry bookkeeping. It will be made strictly practical and only sufficient theory will be introduced to give the student a firm foundation for his work. The basis of the work will be a study of a model general store equipped with the latest labor-saving methods of bookkeeping and office practice. Eight lectures and demonstrations.

Business Law. The course in Business Law will begin with the thought that there are certain fundamental principles of commercial law with which everyone should be familiar, and will include the following important subjects: property, contracts, negotiable instruments, interest and usury, bailment, agency and partnership, and real estate. Eight lectures.

Business Forms and Letter Writing. The purpose of this course will be to familiarize the student with various forms used in general business practice. Exercises will be required illustrating both principle and practice in a clear, simple understandable manner. In the work of letter writing the correct form, wording, and general arrangement of the business letter will be taken up. Original letters, received from the most important manufacturing concerns and business houses of the United States, will be studied. Eight lectures.

Penmanship. The work in penmanship will embrace the study and practice of the best forms and style of practical business writing. The primary aim of the course will be to develop an easy, rapid, legible business hand. Eight lectures a week.

Typewriting and Office Methods. The work in typewriting will be outlined to suit the requirements of the individual student. The beginner will be taught the correct method of fingering, the uses of the various parts of the machine, the care of the machine, manifold, and the correct arrangement of the typewritten letter or form.

Farm Accounting. A complete analysis of farm accounts by different methods, in which simplicity, accuracy, and labor-saving are emphasized; household and personal accounts; cost accounting and special records; cost of production; special cost records; labor records; milk records; poultry records; etc.; the farm plot; office methods; business organizations; business correspondence and business forms. Eight lectures and demonstrations.

Rural Law. The general principles of common and statutory law are discussed and explained; special phases of law affecting the farm, such as titles to real estate, deeds, mortgages, county records, etc.; landlord and tenant; eminent domain, and right-of-way; water rights and boundaries; laws governing shipping, insurance, banking, etc.; court procedure. Eight lectures.

Rural Economics. The fundamental principles of production, distribution, and exchange with special reference to rural life.

Rural labor problems, farm finance, legislative problems affecting rural life, cooperative organizations, marketing products, advertising, the economics of machinery, transportation, etc. Eight lectures.

HOME ECONOMICS

These courses are designed for all women who are interested in the practical and scientific working out of household problems, and who are unable to avail themselves of a regular course in Home Economics. Many agricultural men and their sons yearly take advantage of the Short Courses which deal with the problems of the farm, such as feeding of cattle, judging of corn, study of soils, etc. It is to meet the demand of Oregon women who are interested in the correct feeding of the family, the judging and selection of materials used in the home, the making of suitable and attractive clothing, and a study of sanitary conditions which lead to the health, comfort, and happiness of the family, that this course has been established, and is to be carried on.

The courses outlined below are essentially those that are usually sought by patrons of the Short Course. Some variation, to meet the special needs of each session or to conform to the teaching program of the School of Home Economics, will doubtless be advisable. Consult the special circular and program of courses issued each year for the Winter Short Course.

Food Preparation. This course deals with the subject of foods and food preparation in its scientific and economic aspect. It is the study of the nutritive principles as they are found in various foods, and the method of cooking foods to retain those principles in a form most completely and easily digested; serving of food in simple and attractive form; economy of money, time, and labor being the watchword.

Special Food Preparation. This course consists of the selection and preparation of foods for children of different ages, adults in active life, the aged, and invalids.

Household Management.

General health and welfare of the home.

- (a) Economy of time, labor, and income.
- (b) Sanitation of the home.
- (c) Home nursing.

Note.—These courses have been planned to meet the needs of those who have had previous work, as well as those who are entering for the first time.

Plain Sewing. This course is planned for those women wishing instruction in the economical purchasing and making of household linens and underwear; the mending and renovating of old garments usually found in all households; the draughting of patterns for underwear to the student's own measurements, together with the practice of interpreting and using purchased patterns.

All women are eligible to this course.

Dressmaking. This course offers instruction in the principles of dressmaking; the taking of accurate measurements; the draughting and use of patterns; the choosing and economical cutting of materials; the making of at least one dress, with special emphasis on artistic color combinations and suitable design.

Tests will be made showing the adulterations of textiles; and simple methods of detecting the adulterations in dress materials will be given.

This course is given for the women who have had experience in sewing and dressmaking.

Advanced Dressmaking. Students who have previously taken one winter's short course will be given instruction in advanced dressmaking, if they so desire.

Millinery. This work will be given by lectures and demonstrations only. No practice work will be given to the students.

Basketry. This course will be given three times each week.

Care of Children. Three lectures each week will be given on the care of children. Only mature women will be admitted to this class.

Camp Cookery. The course in Camp Cookery consists of two laboratory lessons each week. It is especially designed for men, but women are admitted if the class is not already full. Only twenty students can enter these classes.

ENGINEERING AND INDUSTRIAL ARTS

It is the purpose to teach the subjects offered in a straightforward, practical manner, which can be readily grasped and understood by farmers, mechanics, and others who have had only the advantage of a common school education.

Woodworking. Considerable latitude will be allowed in choosing the particular line of work desired in this department as set forth under the following headings:

(a) A course for those not familiar with the care and handling of tools. This course affords instruction in the correct methods

of using, sharpening, and caring for the tools of the carpenter's bench. The work is exemplified by exercises in planing, sawing, chiseling, and the construction of useful articles of furniture.

(b) The Steel Square and Its Use. This work includes laying out rafters, braces, stairs, and other work with the steel square. Lectures will be given on the use of the square, after which the actual construction of work will be undertaken by the student.

(c) Instruction in the use of paints, stains, and varnishes.

Blacksmithing. Two lines of work are offered in blacksmithing:

(a) Students with no previous knowledge of blacksmithing are taught how to build and manage a forge fire; how to draw, bend, upset, forge, and weld iron; how to make chains, clevises, hooks, gate-hinges, whiffletrees and neckyoke irons, and other useful articles.

(b) A course in working and welding steel for those with some general knowledge of blacksmithing. This course includes a study of the different grades of steel; the effect of heat treatment on the quality and temper of steel; the use of the color scale in tempering; and finally the forging, dressing, and tempering of steel tools.

Road Building and Maintenance. A course of lectures on practical road construction and maintenance. This course will consist of three or more lectures each week during the short course on the fundamental principles of road construction and maintenance, and will include lectures on the following subjects: Alignment; grade; drainage; the road census and the interpretation of its results; selection of type of roads; maintenance of different types of roads; the road drag; road machinery; culverts and small bridges, etc.

Special laboratory work will be arranged for those desiring to study the physical properties of road building materials.

Concrete. A course of lectures will be given on the theory of concrete and on its practical application to farm and highway structures, walks, etc. In this course proper proportioning for different classes of work, proper aggregate, causes of failure, costs, and methods will be discussed.

THE SCHOOL OF MUSIC

The School of Music is a self-supporting department of the Oregon State Agricultural College, organized in 1908 under the present management by authorization of the Board of Regents, in response to insistent demand therefor from the student body.

The School of Music serves the State as efficiently as possible at no greater expense to students than is necessary, rates of tuition being no greater than in other similar standard colleges and universities.

The studious atmosphere, wholesome discipline, adequate modern musical equipment, and attractive environment of Oregon State Agricultural College are favorable alike to those just beginning music study and to advanced students, all of whom may enter at any time and advance to graduation as rapidly as consistent with creditable scholarship.

The time required for completion of the various courses offered is somewhat dependent upon the age, temperament, talent, ability, and character of work of each student.

The members of the faculty are accomplished performers. As instructors they are skilled in the psychology, and experienced in the practice of teaching. In undertaking these courses students may confidently anticipate maximum gain in musical efficiency at minimum expenditure of time and money.

FACULTY

DEPARTMENT OF VOICE

WILLIAM FREDERIC GASKINS, Mus. Bach.

Director of the School of Music.

Professor of Music.

Professor of Voice Culture, Singing, Conducting, Music History.

Graduate student Hillsdale College Conservatory; Graduate

student American Conservatory; Graduate student of

Karlton Hackett, Chicago; J. D. Mehan, New

York, F. X. Arens, New York.

GENEVIEVE BAUM-GASKINS

Instructor in Voice Culture and Singing.

Graduate American Conservatory, Chicago; Student of William

Nelson Buritt, New York; Karlton Hackett, Chicago; William

Frederic Gaskins, Chicago; John Dennis Mehan, New York.

DEPARTMENT OF PIANO
GENEVIEVE BAUM-GASKINS

Instructor.

Student of John J. Hattseadt, Chicago; Graduate American Conservatory, Chicago.

MAY BABBITT-RESSLER

Instructor.

Student of Arthur Foote, Boston; Leschetizky method studied with Jeanne Marie Mattoon, New York.

CORINNE BLOUNT *

Instructor.

Student of Emil Liebling, Chicago; Victor Garwood, American Conservatory, Chicago; Oliver Willard Pierce, Indianapolis.

GUSTAV DUNKELBERGER, Mus. Bach.

Instructor.

Graduate of Bethel College Conservatory; Graduate student of American Conservatory, Chicago; student of Heniot Levy, Arthur Oluf Anderson, Adolph Weidig, Chicago.

DEPARTMENT OF ORGAN
GENEVIEVE BAUM-GASKINS

Instructor.

Student of Wilhelm Middleschulte, Chicago.

DEPARTMENT OF STRING INSTRUMENTS

ANDREAS GOETTEL

Instructor.

Student of Albert Kuenzlein, Conrad Becker, and William Berwald, of Syracuse University Conservatory, New York

DEPARTMENT OF THEORY

WILLIAM FREDERIC GASKINS, Mus. Bach.

Theory of Music. History of Music.

GUSTAV DUNKELBERGER, CORINNE BLOUNT *

Harmony, Counterpoint, Harmonic Analysis, Composition

ANDREAS GOETTEL

Orchestration.

DEPARTMENT OF BAND INSTRUMENTS

HARRY LYNDEN BEARD

Student of Herbert L. Clarke of Sousa's Band.

Instructor in Theory and Art of Playing Band Instruments.

Band Conducting.

* On leave of absence while continuing advanced study in Leschetizky methods of pianoforte playing with Oliver Willard Pierce, Indianapolis.

COURSES IN MUSIC

In these courses the following subjects are included: elements of music, history of music, interpretation, languages, music form and analysis, music pedagogics, song singing, oratorio singing, opera singing, choral singing, organ playing, organ structure, piano playing, piano structure, sight reading, stage deportment, stringed instrument playing, wind instrument playing, brass instrument playing, theory, harmony, counterpoint, composition, voice culture.

The following courses are offered:

1. **Voice.** Exercises will be given for correct breath control; purity of tone production; freedom of action and blending of registers; articulation and correct pronunciation and enunciation of vowels and consonants; elements of phrasing and style. Students must appear on programs if requested, singing from memory, and attend all rehearsals and recitals unless otherwise instructed by the Director.

Required: Two lessons a week in voice, practice with instrument one hour daily; harmony, courses 10 and 11; and history of music, two hours a week each; choir and chorus practice. Physical education.

2. **Voice.** This course consists of exercises for tone placing; phrasing and style; legato, marcato, and portamento delivery. Physiology of the vocal mechanism. First year German, Italian, or French, at student's option unless otherwise advised by the Director. Songs and exercises of medium grade of difficulty. Attendance and performance at recitals and rehearsals required, unless otherwise instructed by the Director.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; harmony, courses 12 and 13; two hours a week each; German, Italian, or French; physical education.

Prerequisite: Course 1 or its equivalent.

3. **Voice.** This course includes the study of tone color, agility, the trill, messa di voce, recitation, declamation, phrasing, style; songs in English, German, French, Italian; the regular second year study of one of the above foreign languages at the student's option, in the department of Modern Languages, unless otherwise advised by the Director. Attendance and performance at recitals and rehearsals required unless otherwise directed as above, singing from memory on programs of the School of Music when so required.

Required: Two lessons a week in voice; two lessons a week each in harmony, courses 14, 15, and 16; German, French, or Italian, at student's option, second year study as required in department of Modern Languages; choir and chorus practice; physical education.

Prerequisite: Course 2 or its equivalent.

4. Voice. This course includes advanced study of vocal technique by means of difficult exercises, songs, oratorios, operatic arias, declamation. Advanced composition throughout the year. Orchestration, course 18. Attendance at rehearsals required in preparation for public appearances, and at recitals, singing from memory. For graduation a public recital must be given as arranged by the Director, unless he may specify to the contrary. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 3 or its equivalent.

5. Piano Preparatory Course. For beginners. Training of the hand, fingers, wrist, and arm. Extended preparation for scales and arpeggios. Easy studies by Bertini, Duvernoy, Loeschhorn, and others. Selections from easier works of Clementi, Haydn, Beethoven, and other easy appropriate compositions.

Required: Two lessons a week in piano; practice with instrument, one to three hours daily.

6. Piano. Scales and arpeggios. Exercises for endurance, speed, accent, and rhythm. Etudes from Czerny, Cramer, Moszkowski, and others. Easy sonatas of Haydn, Mozart, and Beethoven. Easy compositions of Mendelssohn, Schubert, Schumann, Grieg, and others.

Required: Two lessons a week in piano; two lessons a week in harmony, course 10; two lessons a week in music history for thirty-six weeks; practice with instrument, two to four hours daily. Physical education.

Prerequisite: Course 5 or its equivalent.

7. Piano. Scales in various forms and technical exercises adapted to the particular needs of the student. Etudes of Czerny, Cramer, Ruthardt, and others. Suites and inventions by Bach. Mozart, Beethoven, and Weber sonatas of moderate difficulty. More difficult selections from Mendelssohn, Schumann, Chopin, Liszt, and others. Transposition of easy hymns, sight reading, and memory training.

Required: Two lessons a week in piano; two lessons a week in harmony, course 11; two lessons a week in ear-training, course

13; practice with instrument, three to five hours daily. German or French. Physical education.

Prerequisite: Course 6 or its equivalent.

To complete this course satisfactorily the student must fulfill the requirements above outlined and perform in public when requested by the instructor and approved by the Director.

8. Piano. Exercises based on the technical difficulties in compositions studied in this course. A limited number of etudes by Rubinstein, Henselt, Harberbier, and others. Well-tempered clavier. The more difficult sonatas of Beethoven and solos by Mendelssohn, Chopin, Schumann, Grieg, Liszt, Brahms, and others. Concertos by Mozart, Mendelssohn, Beethoven, and Moscheles.

Required: Two lessons a week in piano; two lessons a week in harmony, course 12; two lessons a week in piano; two lessons a week in harmony, course 12; two lessons a week in counterpoint, course 14. German or French. Physical education.

Prerequisite: Course 7 or its equivalent.

To complete this course satisfactorily the student must fulfill the requirements above outlined and perform in public when requested by the instructor and approved by the Director.

9. Piano. Comprehensive study of the principal classic and romantic composers. Etudes by Chopin and Moszkowski. Solo works of modern composers. Concertos by Schumann, Chopin, Rubinstein, and others.

Required; two lessons a week in piano; two lessons a week each in harmonic analysis, course 16, composition, course 17, and orchestration, course 18; practice with instrument, three to five hours daily. Public performances under conditions approved by the Director.

Prerequisite: Course 8 or its equivalent.

For graduation, students are required to perform publicly under the direction of the School of Music, playing a program not less than one hour in length, arranged by the instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Theory. The courses in theory will comprise systematic and progressive study in the science of music. Consideration will be given to the theories of acoustics, to notation, scales, keys, modes, sight reading, intervals, melodic progression, tempo, dynamics, rhythm, and ear training. Advanced theory will embrace harmony,

counterpoint and subdivisions thereof, music history, concluding with form, composition, and orchestration.

10. Harmony. Consideration will be given to the theories of acoustics, the formation of the diatonic scale, to intervals, chord construction, the relative importance of triads within one key, connection of primary triads, rhythm, the elements of melodic construction, and part writing. Harmonization of melodies and unfigured basses. Original periods.

11. Harmony. Key relations. Chords of the seventh. Direct and extraneous modulation. Altered and mixed chords.

Prerequisite: Course 10.

12. Harmony. Inharmonic tones. Accompaniment. Original work. Study of the various modern harmonic theories.

Prerequisite: Course 11.

13. Ear-training. Aural recognition of intervals demonstrated orally and in writing. Singing of diatonic and chromatic intervals from given tones. Writing at dictation of moderately difficult melodies and harmonic progressions.

14. Counterpoint. Simple counterpoint in five species employing from two to eight parts. Original exercises. Contrapuntal chorale elaborations.

Prerequisite: Course 11 or its equivalent.

15. Counterpoint. Double, triple, and quadruple counterpoint. The canon, invention, and the various species of fugue, single and double.

Prerequisites: Courses 12, 13, and 14.

16. Harmonic Analysis. Detailed analysis of representative works of the masters and other compositions. Harmonic memorizing of moderately difficult selections.

Prerequisites: Courses 12 and 13.

17. Composition. The application of harmonic material in original exercises in the various forms of composition, including the primary forms, the vocal song, theme with variations, etude, rondo forms, sonatina and sonata.

Prerequisites: Courses 12, 13, and 14.

18. Orchestration. The arrangement of music for orchestra. The theoretical study of orchestral instruments and their functions.

19. Violin. This course is preparatory, and designed to develop correct fingering, free bowing, and accuracy as to pitch and rhythm and intonation.

Studies. Sevcik School, Greenberg, major scales, minor scales in the first position; studies by Hohman, Kayser, and others, elementary solos; special sight reading duos by Mazas and Dancla. Other appropriate studies may be substituted for the above, if approved by the Director, as acceptable equivalents, the same to be satisfactorily performed before entering course 20.

Students must appear in public recitals when required by the Director, playing from memory.

Required: Two lessons a week, harmony, music history, as in courses 10 and 11.

20. Studies by Kayser, Wohlfahrt, Schradieck, Mazas, Dont, and Kreutzer. Scales by Hrimaly and Schradieck or acceptable equivalents. Suitable solos, concertos, sonatas, etc. Students must appear in performance at public recitals when required by the Director, playing from memory.

Required: Two lessons a week, harmony, courses 11 and 12, and Counterpoint, course 14.

Prerequisite: Course 19.

21. This course consists of advanced studies by Dancla, Fiorilo, Singer, Rode, Gavinies, Paganini; solos by Dvorak, Brahms, Vieutemps, Rovelli, Spohr, De Beriot, Viotti, Wieniawski, or other acceptable equivalents. Students must appear in public recitals when requested, playing from memory.

Required: Two lessons a week, harmonic analysis, composition, German or French, as in course 8. As a qualification for graduation students are required to perform publicly, under the direction of the School of Music, a program not less than an hour in length, arranged by the Instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 12.

The Orchestra. Students of string instruments in attendance at the College, who are sufficiently advanced, may be admitted to membership in the College Orchestra by arrangement with the Conductor on such terms as may be approved by the Director. It is the intention of the management to encourage in every reasonable manner the development and maintenance of a good orchestra under competent progressive leadership. Students are invited to investigate these opportunities for excellent training in orchestra routine and solo playing. Such experience and thorough drill are of great educational and cultural value. No student able to play fairly well should fail to avail himself of this training.

The Orchestra library consists of works by the following composers: Dvorak, Brahms, Tschaikowsky, Grieg, Grounor, Verdi, Mendelssohn, Beethoven, Elgar, Wagner, Offenbach, Strauss, and others.

Ensemble: Sonatas for violin and piano; string trios; quartettes for two violins, viola, and 'cello; and for four violins, will be studied. All students in the above classes, or registered in any of the above courses, must perform from memory in public when requested by the Director. Membership in the ensemble classes is free, and instruction is to be given by the principal violin instructor.

BAND INSTRUMENTS

Instruction will be given by the regular College band leader in the use of brass, wood-wind, and percussion instruments.

To become a member of the College Band, a student must pass a satisfactory examination in the elements of music and ability to perform on his instrument.

Members are required to attend rehearsals each school day, and a reasonable amount of individual practice is expected.

There is no charge for instruction in the band. Each member must furnish his own instrument and music stand, except basses, baritones, altos, and drums, whose instruments are furnished by the College.

Any student desiring to enter the band should see that his instrument is in low pitch.

The courses for the various band instruments are as follows:

22. **Cornet.** Methods by Arbon; characteristic studies by St. Jacome.

23. **Clarinet.** Methods by Dieppo; studies by Dieppo and Blume.

24. **French Horn.** Methods by Franz; studies by Franz and Hayffman.

25. In all other band instruments, including the oboe, bassoon, saxophone, alto, and bass clarinets, drummer's trapps, xylophone, and orchestra bells, the courses will be similar to those given above.

The work in theory required to complete these courses is that outlined for piano courses 6 and 7.

Any student in the Oregon Agricultural College with a satisfactory record in scholarship in his major course may take at least one hour a day in music.

The authority to register and assign all applicants for music instruction is vested solely in the Director, who must first be consulted for the arrangement of details of registration, or at any time when information is required that pertains to study in the various departments of the School of Music.

Students in the School of Music may enter classes in the several departments of the College; and in order to enhance their general culture are encouraged to take at least one study throughout the school year other than the work required in the regular music courses.

Applicants for instruction may take complete or part courses. Those registering for the former are classified as "regular music," while the others are classified as "special music."

"Special Music" students have the option of selecting such music studies as they desire by registering for the same with the Director in the regular manner and at the catalogue rate of tuition.

Non-resident young women are required to live in the dormitories, where their conduct is subject to the approval of the Preceptress. Outside rooming and boarding places may be obtained, subject to the approval of the College authorities. The rates for board and room are listed elsewhere in detail.

Students registered for study in the regular courses of the Oregon Agricultural College School of Music are subject to the same rules and regulations as all regular students in other courses.

No student is permitted to omit lessons or practice without sufficient excuse, and no refund will be made for absence from lessons or practice or for discontinuance, except in cases of severe personal illness; for such unavoidable absence, lessons may be made up only by appointment, and before the expiration of the term.

Lessons falling on legal holidays, or on special holidays petitioned for by the student body or by special student organizations, which may be granted by the College authorities, will not be made up.

Students will not be permitted to transfer tuition accounts to others, nor to receive credit for tuition fees beyond the assigned registration period, except in cases of severe personal illness, attested by a physician, or similar extreme necessity, and then only by making suitable arrangements with the Director.

The College year in the School of Music consists of thirty-six weeks, divided into terms of about twelve weeks each, the first term beginning at the opening of the College on September 17, 1917.

Tuition. Private individual instruction is given in lessons of thirty minutes each, in all departments of the School of Music. Class instruction in theoretical branches is required of candidates for graduation, as specified in the preceding outlines of courses. Terms for instruction are as follows:

Voice Culture and Singing — Professor Gaskins, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Organ — Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....	\$24.00
Two lessons a week, a term.....	48.00

Piano — Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Piano — May Babbit-Ressler, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Piano — Instructor Corinne Blount, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Piano — Instructor Dunkelberger, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Violin, Violoncello, Viola — Instructor Goettel, private instruction:

One half-hour lesson a week, a term.....	\$15.00
Two half-hour lessons a week, a term.....	30.00

Mandolin, Banjo, Guitar — Instructor Goettel, private instruction:

One half-hour lesson a week, a term.....	\$15.00
Two half-hour lessons a week, a term.....	30.00

Band Instruments — Instructor Beard, private instruction:

One lesson a week, a term.....	\$10.00
Two lessons a week, a term.....	20.00

Music History — Professor Gaskins, class instruction:

Two hours a week, one term.....	\$ 3.00
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Theory—Courses 10 to 18 inclusive, Instructors Dunkelberger, Blount, Goettel, as assigned by the Director; each course, a term.....

\$ 7.50

PRACTICE

Rooms located in one of the College buildings have been suitably furnished for the use of students wishing to practice in private. These rooms may be rented for about one-third the cost of using pianos located in private houses, and without any of the disadvantages in connection therewith. They have steam heat, good ventilation, electric light for night practice, and good janitor service and are furnished with good pianos, kept in tune by the College. Students living in the College dormitories are required to practice upon these pianos. Students living away from the campus may arrange with the Director for practice on the same terms and conditions, as follows:

Piano—

Term of twelve weeks, one hour a day.....	\$ 5.00
Two hours	7.50
Three hours	10.00
Four hours	12.50
Five hours	15.00

Organ—

Term of twelve weeks, one hour a day.....	\$12.00
Two hours	18.00

The pipe organ is a new, modern Kimball two manual, concave pedal board instrument of beautiful tone.

For additional information address William Frederic Gaskins, Director, Room 30, Administration Building, Oregon Agricultural College, Corvallis, Oregon.

THE EXPERIMENT STATION

ARTHUR BURTON CORDLEY, Director
CLAUDE ISAAC LEWIS, Vice Director

The Agricultural Experiment Station bears an important relation to the College, as the scientific investigations conducted by the staff strongly support the instruction given in the class room and through the extension service. Aside from the original investigations of economic significance to agriculture, the work of the Station affords daily object lessons in modern farm methods.

About 650 acres of land are available for the use of the College and Station workers. This land is utilized by the various departments represented in Station organization, including the departments of Chemistry, Drainage and Irrigation, Farm Crops, Farm Mechanics, Soils and Farm Management, Horticulture, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Entomology, Bacteriology, Pharmacy, and Botany and Plant Pathology. Each department is actively engaged in the scientific investigation of problems presented by the different branches of agriculture.

In addition to the experimental work carried on by the departments of the School of Agriculture, experimental work is also conducted by the School of Engineering, the School of Home Economics, and the department of Pharmacy.

The value of such work, as an object lesson to the students in the various fields of study, can hardly be overestimated. Its value to the State, from the point of view of economic progress, has been greater, in the estimation of many careful observers, than the entire cost of the College to the people.

As an illustration of the comprehensive character of the investigational work carried on by the Station, the following brief summaries of projects, by departments, is presented:

Agricultural Chemistry. This department, either independently or in cooperation with other departments of the College, has under way a considerable number of experiments that are of wide significance both to the economic interests of the State and Nation and to the cause of science. Experiments with arsenical sprays, that represent a total annual expenditure throughout the country of six to eight million dollars, are directed to the object, first, of determining exactly how the efficiency of these arsenicals is best conserved, and second, how a less expensive form of a similar insecticide may be developed. The first object has been partly accomplished, with

promise of conclusive results, and the second, through the use of arsenate calcium, seems also within reach of fulfillment. Soil investigations conducted in cooperation with the department of Bacteriology are directed to the determination of how nitrogenous organic matter in the soil is made available, through ammonification and nitrification, for plant food, and how nitrogenous substances, present in the soil in forms unavailable for plant food, may be broken down and rendered soluble and available for use of growing plants. In cooperation with the Southern Oregon Branch Experiment Station, at Talent, the department has made a complete chemical survey of the soils of the Rogue River Valley, with a view to determining the deficiencies to be supplied by fertilizers. Sulfur is found to be the element, which, when added to certain of these soils, increases the production of alfalfa and other legumes by percentages running into the hundreds. These fertilizer experiments promise some very striking and valuable results. Incubation experiments, now reaching completion after several years of laborious and painstaking study, go to show that varying the conditions of incubation varies also the quality of the chicks produced. Limited experiments with loganberry juice have been conducted to determine what jelly-making acids are present in the juice, what modifications appear in the juice of the second pressing, and what use may be made of the pulp. Soil analyses conducted in connection with the reclamation service have comprehended one-half million acres of land. Routine analyses of commercial fertilizers, especially of limestone, have shown the need of caution in the use of these fertilizers at current prices unless the quality is high. Analyses of all insecticides on the market are on file at the Chemist's office, where information concerning any of them may be had, free of charge, on application.

Animal Husbandry. Experiments in Animal Husbandry, which comprehend tests with horses, beef cattle, sheep, and swine, are conducted partly at the Corvallis Station and partly at the Eastern Oregon Branch Station. Experiments with horses are directed to determine the cost of horse power for various types of farm and other work; the amount of work that may reasonably be expected from a horse; the cost of keep, etc. Experiments with beef cattle, conducted chiefly at Union, have shown striking results in the use of grain with alfalfa hay and pasture. Experiments with sheep, chiefly at the home Station, have been directed to determine the cost of production, the carrying capacity of different types of pas-

ture, methods of fattening sheep, and methods of rearing and marketing lambs for meat purposes. Experiments with hogs involve the cost of production, including rapidity of gain; and comparison of different feeding rations and methods of feeding, including use of pasture.

Bacteriology. Experimental work in Bacteriology is chiefly concerned with soil analyses, with dairy manufacturing, sanitation, and diseases of poultry. Three experimental projects of economic importance that are now under way are the following: (1) The effect of lime and landplaster on the growth of soil bacteria and therefore on the crop; (2) The effect of dryness and varying degrees of soil acidity on the growth of legume bacteria; (3) The facts concerning the prevalence, transmission, and means of control of chicken diseases such as tuberculosis and white diarrhoea.

Botany and Plant Pathology. Experimental work in this department is devoted chiefly to six projects; namely, (1) The life-history and control of brown-rot diseases of fruits and twigs; (2) Bacterial gummosis of cherries and other stone fruits; methods of communication and control; (3) Diseases of potatoes; (4) Wilt diseases of clovers and alfalfa; (5) Bacterial blight of filberts; (6) Spraying for orchard diseases. The gummosis investigations, which have now been under way for several years, have yielded striking results, and promise to lead to effective methods of controlling this most devastating disease of the chief varieties of commercial cherries in Oregon.

Dairy Husbandry. Experiments in this department are directed to standardizing the color of butter and to determining the amount of coloring matter to be added to cream of a certain test, by sample, in order to bring it to standard color, or "June shade;" to determine whether or not to use "starter" in churning butter; to determine the keeping quality of butter made from cream of different degrees of acidity, neutralized, pasteurized, and churned; to determine, by testing the different factors in the handling of milk, what are the essentials in reducing the bacterial count of milk for market; to determine the function of the so-called milk veins and their bearing on milk production; to determine the factors influencing the percentage of butter fat content in milk; to determine the feeding value of alfalfa meal as a substitute for the usual grain feeds; to determine the value of kale as compared with silage as a succulent feed.

Drainage and Irrigation. Five specific projects of considerable breadth and importance are under investigation by this department. Following is a brief outline of the projects and their aim. (1) Irrigation and Soil Moisture Investigations in Western Oregon. These are four-years rotations to measure the value of irrigation, rotation, and manure in increasing crop yields and lessening water requirement. In connection with these investigations three-years rotations on white lands are being conducted cooperatively to determine the effect of this rotation treatment on bacterial activity and chemical composition of the soil. (2) Duty of Water Investigations. This work is conducted cooperatively with the U. S. Office of Irrigation Investigations. It is State-wide in scope, with agencies at Paisley and Burns in Eastern Oregon. The aim is to determine the right amount of water for the chief soil types and leading crops under the main types of farming in the principal irrigated valleys of the State. (3) Drainage Experiments. This work, which is conducted on a nine-acres tiled tract of the College farm, is directed to determining the efficiency of drains spaced at intervals of 25 to 100 feet. The ten-years trials indicate that on this type of clay soil 50 feet is the most efficient distance for spacing drains. (4) Experiments in Drainage to determine the most efficient depth for placing drains in soils of different types, and for testing the efficiency of bedding drains in straw and gravel. Since there are one-half million acres of marsh land in the State and three million acres of land periodically wet, the value of these investigations is obvious. If efficient drainage added to the value of the land the average determined for this work in the Middle West, the reclamation of the State's wet soils would add at least \$10 an acre to the value of these millions of acres.

Entomology. Experiments in Entomology include tests to determine the toxicity of various insecticides with three objects in view: (1) To discover new and cheaper insecticides; (2) To discover possible combinations of sprays that will reduce the number of necessary applications; (3) To determine the actual amount of poison necessary to kill a given insect. Experiments also include tests to determine possible means of control for root borers and other root-infesting insects that carry plant diseases; a systematic and economic study of insects attacking Douglas fir; and a study of the economic slugs of the Pacific Northwest.

Farm Crops. This department has in hand four specific experimental projects of chief importance; namely, (1) Variety tests

of wheat, oats, barley, flax, vetch, potatoes, and corn; (2) Cultural tests on miscellaneous crops such as sudan grass, sunflowers, mustard, soy beans, and cow peas; (3) Seeding experiments on the time, rate, and date of seeding cereals and legumes; (4) Selection and breeding work with cereals and legumes.

Horticulture. Experiments in Horticulture comprise the following types of investigations: (1) The pollination of the Pomaceous Fruits, including the Gross Morphology of the Apple, Fruit Bud Development of the Apple; Variation of the Internal Structure of Apple Varieties, etc. (2) Irrigation work with apples and pears, (3) Experiments with stocks of both apples and pears, (4) Problems of both winter and summer pruning, (5) A study of critical temperatures, (6) Strawberry variety tests, (7) Cover-crop investigations, (8) Fertilizer investigations, (9) Breeding investigations with cherries, apples, prunes, and strawberries, (10) Investigations in orchard economics, (11) Vegetable gardening investigations with greenhouse tomatoes, onions, and type selection for canning, (12) Investigations with by-products of loganberries and other fruits; (13) Investigations in the relation of depth of planting to mortality of trees.

Poultry Husbandry. Experiments in poultry husbandry are chiefly concerned with problems of incubation and with breeding fowls for high average egg production, and for a combination of egg production and meat value. Results in both fields of experimentation have already been remarkable and promise still greater progress toward the objects desired. A new breed, the Oregon, seems to be established with the attributes sought.

Soils and Farm Management. This department is concerned with the following different lines of investigation: (1) Soil Fertility Investigations, including, (a) Fertilizer trials on Willamette Valley clay loam; on Willamette Valley white lands; on Willamette Valley fine sandy loam; (b) Cooperative trials on Willamette Valley clay loam; on Eastern Oregon silt loam; on Central Oregon sandy loam; (c) Cooperative fertilizer trials in Marion, Yamhill, Benton, Coos, and Josephine counties; (2) Agricultural lime investigations, (3) Dry-farming tillage investigations, (4) Soil moisture investigations, (5) Pumice soil investigations, (6) Adobe soil investigations, (7) Soil surveys of irrigation projects, (8) Farm Management surveys, (9) Cost of Production Investigations.

Veterinary Medicine. The experimental work of this department has been devoted chiefly to finding means for prevention of sterility in cattle.

EXTENSION SERVICE

RALPH DORN HETZEL, Director

The Extension Service of the Oregon Agricultural College represents one of the three main divisions of the college activities; namely, college instruction, experiment station, and college extension. It includes in its present form the following distinct lines of work: (1) Publication of bulletins. (2) Correspondence courses. (3) Farmers courses and meetings. (4) All exhibits made at fairs and upon special occasions. (5) Class work and lectures at local chautauquas. (6) Movable schools of from two to six days duration. (7) Individual advisory work with the farmers of the State. (8) Officiating and judging at fairs. (9) Conducting Farmers' and Home Makers' Weeks of from one to two weeks' duration — one at the College, one in Eastern Oregon, and one in Southern Oregon. (10) The supervision and direction of the boys' and girls' industrial club work in cooperation with the Superintendent of Public Instruction. (11) Special field dairy work and assistance in dairy organizations. (12) The supervision and direction of county agent work. (13) Farm management demonstrations. (14) Assisting in rural organization and in the marketing of farm products. (15) Personal advisory work by correspondence.

Extension Subjects. Extension teaching is concerned with all instruction given by the College which is not classified as a part of the regular resident work. The subjects which are included in the extension work are, therefore, all the subjects taught at the College which are of such nature as to lend themselves to extension methods. While the College, in the past, has been exclusively concerned with agricultural and home economics extension, it has now provided for extension work in all lines of instructional effort.

In addition to the instruction offered in the various branches of agriculture, home economics, commerce, and engineering which is specifically outlined in the pages following, extension instruction is also being given in forestry, mining engineering, mechanical engineering, electrical engineering, commerce, highway engineering, education and other scientific and industrial subjects. While it is clearly impossible to attempt to give complete and full courses in the great majority of these lines of work, there is much that is practical, usable, and valuable that can be taught through extension methods. It is, then, only such branches of the College work as can be effectively taught without residence requirement, that will come within the scope of extension work.

SUMMARY OF ALL EXTENSION STAFF ACTIVITIES OTHER THAN
COUNTY AGENT WORK

	1915-1916	
	No.	No. People reached through this service
Lecture Work (one lecture to two-day engagements arranged by requests from communities)	649	58,357
Club Work (lecture engagements).....	481	44,393
Demonstrations by Specialists.....	543	30,297
Farmers' and Home Makers' Week.....	1	1,283
Demonstration Train	1	3,220
Movable Schools (three- to five-day engagements)	16	11,155
Fair (Exhibitions and Judging).....	44	35,040
Conferences	1,579	7,632
Farms visited for personal advisory work.....	1,498	3,756
Letters written	33,397	33,397
Press articles prepared	1,106	\$221,200
Correspondence courses	19	23
Publications—		
New Bulletins	12	
Number pages	194	
Number issued	110,500	\$221,000
Reprints	9	
Number pages	55	
Number issued	29,000	\$58,000
Barn and silo blueprints.....	2	37
Miles traveled—		
By rail	146,028	
Otherwise	32,172	
Total number people reached—		
Directly		228,590
Indirectly		\$500,200

Importance of Extension Work in Oregon. The magnitude of the problem of College extension in Oregon can be fully realized only by keeping in mind that the State has a population of nearly 800,000 distributed over a total area of 95,600 square miles—a territory greater than the combined areas of Illinois and Indiana and almost as great as the combined areas of New York, New Jersey, and Pennsylvania. The State, moreover, has few railroads, and in certain sections is very sparsely settled. The people who are to be reached by extension methods represent the greatest extremes in age, capacity, education, and in experience with the climate and the country. Oregon's great diversity in elevation, precipitation, temperature, soil, and climatic conditions, still further complicates the problem of extension service, and makes it important in proportion to its complexity.

How to Apply. All persons or communities in the State wishing assistance in any of the lines indicated, should communicate with their County Agent, should there be one in the county in which the work is desired, or with the Extension Service, Oregon Agricultural College, Corvallis, Oregon, as far as possible in advance of the time the appointment is desired. Short-notice requests may

not find the College in position to render the best service. If a Movable School is desired, be sure to give all particulars pertaining to the time, the nature of the subjects in which the community will be interested, the number of speakers desired, and the plans for the meeting. If a single lecture or demonstration or exhibit is wanted, be equally prompt and explicit.

It must be remembered that while the College is willing at all times to help all who apply, its staff, facilities, and funds are limited. On this account, the Extension Service is sometimes unable to give aid where it would like most to give it. Requests for instruction or other assistance, however, should not be withheld; since the great majority of the State's needs have been, and generally can be, cheerfully and efficiently met.

Any county desiring to organize under the provisions of the law for agricultural field and demonstration work and the support of a county agriculturist should communicate with R. D. Hetzel, Director of Extension Service at the Agricultural College, in order to determine the best methods of procedure.

ADMINISTRATIVE

RALPH DORN HETZEL, Director
HAZZLITT VICKERS, Secretary

The administrative work of the Extension Service is vested in a director, secretary, and heads of the various departments. The administrative duties consist of planning and coordinating the several lines of Extension work, dividing and assigning funds, planning the Extension campaigns, meetings, schools, conferences, demonstrations, etc., authorizing all Extension publications, planning and arranging exhibits, and supervising the prosecution of all phases of the work. Reports are required covering all lines of Extension Service and periodical reports are made to College officials and other cooperating agencies.

AGRONOMY

JOHN ELMER LARSON, Extension Specialist in Agronomy

Extension Agronomy embraces several distinct lines of work: soils, crops, drainage, irrigation, farm management, and farm mechanics.

The lecture work covers the composition and physical properties of soils, soil fertility, and farm manures. Drainage includes the soil management subsequent to installing drains as well as the

drainage construction work. Irrigation includes the economic use of water, removal of alkali by drainage, etc. The crop work covers crop rotation, cultural methods, housing and storing, farm management, or the business side of farming. Farm mechanics comprehends farm structures, wood and concrete, and care of farm machinery.

The demonstrations include classifications and properties of soils, judging of corn and potatoes and their selection for seed, germination of seeds, operation of farm machinery, and applied principles of drainage.

ANIMAL HUSBANDRY

* EDWARD BLODGETT FITTS
Extension Specialist in Animal Husbandry

Extension Animal Husbandry takes up the different breeds of live stock, the principles of breeding, different feeds and methods of feeding, and the general care and management of beef cattle, horses, swine, sheep, and goats. With beef cattle, special stress is laid upon the use of better sires and better care to obtain best results. Emphasis has been laid upon the unsoundnesses of horses, and the need for the exercise of great care in the selection of sound, pure-bred sires. The results of a large number of pig-feeding experiments at our Experiment Station, showing the most profitable feeds and methods of feeding, have been given the farmer. Better care and management of sheep, the use of better sires, together with improved methods of handling the wool clip, have been urged upon the sheep men. The general aim is to assist the stock raisers in producing better animals at less cost.

BOYS' AND GIRLS' CLUB WORK

HARRY CASE SEYMOUR, State Leader
HELEN JULIA COWGILL, Assistant State Leader
LEONARD JOHN ALLEN, Assistant State Leader, Pig Club Work

The Junior Extension activities of the Oregon Agricultural College take the form of club and contest work among the boys and girls. Those who are, or can be, interested in the basic farm and home enterprises, such as the growing of plants, the rearing of animals, or the work in home economics, are encouraged to enroll for one or more club projects.

The club project, which is to be worked out at home, may take the form of growing 1-16 acre or more of corn, potatoes, vege-

* Half time devoted to Dairy Husbandry work.

tables, etc., the management of a brood sow and litter, or a single pig; raising a flock of chickens; keeping a milk and feed record on a herd of dairy cows; the completion of ten lessons in sewing, baking, or canning — 12 different projects in all.

Assistance is rendered, enthusiasm aroused, and interest sustained in the work by means of Club meetings, circulars and bulletins, and personal visitation by local, county, and State Club leaders.

Prizes are offered to the winners in Club projects at the local, county, and State Club festivals and fairs. The Club members are made to see, however, that the most worth while prizes are the knowledge, skill, and profit that each may derive from the work.

Club work in Oregon is maintained and supervised by the Oregon Agricultural College Extension Service in cooperation with the U. S. Department of Agriculture, and the State Department of Education. The activities of all these agencies are focalized in a State Leader of Club work, who is a member of the Extension Service staff, and to whom all inquiries regarding Club work should be addressed.

CO-OPERATIVE FARM DEMONSTRATION WORK

PAUL VESTAL MARIS, State Leader
Assistant State Leader

The largest department in the Extension Service at the present time is the Farm Demonstration department which includes the county agent work. In charge of this department is a State Leader and an Assistant State Leader. Prosecuting the work throughout the State are the various county agents. At the present time there are fifteen of these men in the Service, located in the counties which have made an initial appropriation for the work. They are charged with the development of the agricultural interests of their respective counties.

For the most effective accomplishment of this purpose the following plan of work has been adopted in Oregon:

Whenever possible the county agent allies himself with and works through existing farmers' organizations which have for their aim the betterment of agricultural conditions. He seeks to have formed a county-wide agricultural council made up of one member of the County Court and one representative from each of these existing organizations. Unorganized communities upon perfecting an organization may elect a member to the aforesaid council. The

county agent, acting with this agricultural council or body of leading farmers, representing the various agricultural interests of the county, decides upon a program of work for the year. This program may include the formation of marketing organizations, such as poultry and egg circles, cattle shippers' associations, potato growers' associations, etc., the organization of drainage districts, conducting practical farm demonstrations pertaining to the management of soils, crops, live stock and orchards, or the control of insect pests and contagious animal diseases.

The county agent, in short, establishes a center of local agricultural interests. He maintains a central office in which is assembled information pertaining to the agriculture of his community. He is the representative of the United States Department of Agriculture, the State Agricultural College, and the county in which he is located, and through the union of these forces he is able to apply the fullest measure of practical and scientific knowledge to the solution of problems and the improvement of country life conditions.

While the county agent renders valuable service to individual farmers, he is obliged to work largely through groups. His greatest service is rendered in dealing with the larger problems of a community, in organizing and directing the farmers in movements for self help, in securing for the county the services of specialists when specialists are needed.

How to Secure a County Agent

Under Section 3 of Chapter 110 of the session laws of 1913 provision is made whereby county courts in counties with areas of less than 5,000 square miles, may appropriate a sum up to \$2000 for the employment of a county agent and maintenance of his office. Larger counties may appropriate up to twice that amount. It is further provided that there shall be available from state funds an amount equal to that appropriated by the county for the support of the work. The government also gives actual financial assistance by contributing to the salaries of administrative officers, granting the franking privilege to the county agents, providing certain supplies, etc. The government, state and county therefore jointly finance the work.

The law of Oregon specifies that the funds for county agent work shall be expended under the direct supervision of the Oregon Agricultural College. The responsibility for the success of the work in each county, therefore, rests largely with this institution.

In order that a county may avail itself of the services of a county agent it is only necessary, from the legal standpoint, that the county court make the necessary appropriation and request the Agricultural College to install and supervise the work. Experience has shown, however, that unless a considerable number of the farmers of the county understand the work and desire it, it is not advisable to introduce it. When the plan of the work and its value to a county are understood, the general experience in Oregon and the country at large is that farmers strongly favor it. In view of these facts, the following plan has been adopted for the introduction of work in counties in Oregon that do not have county agents:

Upon the receipt of a request from a sufficient number of individuals or organizations within a county to indicate an interest, the College, through the Extension Service, will cooperate with these individuals or organizations in carrying on a county-wide campaign of education regarding county-agent work. The local people of the county will be expected to arrange for a series of meetings at which the farmers of the community will be brought together. The College will provide a speaker for these meetings who will, at the same time, prepare explanatory articles for the newspapers of the county. If, after the work has been thoroughly explained in this manner, twenty-five percent or more of the farmers of the county will request the work by petition and agree to aid in organization of an agricultural council to cooperate with the county agent, and provided further that the county court will make the appropriation, the College will then introduce and supervise county agent work in the county.

DAIRYING

* EDWARD BLODGETT FITTS, Extension Specialist in Dairy Husbandry
EDGAR LeROY WESTOVER, Dairy Husbandman
FRANK WALTER KEHRLI, Dairy Husbandman

Extension Dairying carries throughout the State, and helps to put into effective use, information regarding all branches of the dairy industry, such as care and management of the herd, the raising of the calf, the construction of buildings, the breeding and feeding of cattle, the treatment of diseases, the care of milk and cream, and the manufacture of dairy products. Special emphasis and aid is given toward effecting dairy cooperative organizations, such as Cow Testing Associations, Breeders' Associations, Bull

* Half time spent in Animal Husbandry work.

Associations, Farmers' Cooperative Creameries, Farmers' Cooperative Cheese Factories, and Farmers' Cooperative Cream Selling Agencies.

FARM MANAGEMENT DEMONSTRATIONS

WALLACE LA DUE KADDERLY, Farm Management Demonstrator

The purpose of the department of Farm Management Demonstrations is to demonstrate to farmers, in connection with their own farms, a practical and efficient method of summarizing and analyzing a farm business as a means of measuring the profit or loss incurred in conducting it and of deciding upon readjustments that promise to increase its net income.

In a farm management demonstration the business of each farm in a community is analyzed from an economic standpoint and then compared with the others to determine some of the changes which should be made in its organization to make it more profitable.

HIGHWAY ENGINEERING

GORDON VERNON SKELTON,
Extension Specialist in Highway Engineering

Extension Highway Engineering offers its assistance to the county courts, road officials, and citizens of the State generally in attaining a higher standard in road construction and maintenance.

Lectures and demonstrations are given before meetings of county road officials and citizens' organizations on construction and maintenance of all the ordinary types of roads in common use, including consideration of drainage, alignment, and approved methods of construction.

Personal examinations, laboratory tests, and reports on road building materials are also features of the work done.

HOME ECONOMICS

ANNA MAE TURLEY, Extension Specialist in Home Economics

Home Economics Extension offers a means by which the homemakers of the State may call upon the College for assistance in solving their special problems. This work is planned, first, to meet the demand of Oregon women who are interested in all subjects related to the home and better living conditions; and second, to create a greater interest in these subjects concerning the vital problems, three of which are:

1. The food — selection, preparation, and use.
2. The house — its arrangement, decoration, and conveniences.
3. The clothing — methods of removing stains, simple tests for wool, cotton, linen, and silks, selection, preparation, and use.

HORTICULTURE

WALTER SHELDON BROWN, Extension Specialist in Horticulture

Extension Horticulture covers the whole subject of orchard operations including cultivation, pruning, spraying, thinning, harvesting and marketing, laying especial emphasis upon the vital question of reducing the cost of producing and handling fruits.

Small fruits and vegetables will have their share of attention and the improvement of the surroundings of our farm homes will be emphasized as a matter of great importance.

Improvement in the quality of the exhibits of county and community fairs, better arrangements of such exhibits, and a clearer and more uniform method of classification of exhibits is a subject that will be given considerable attention.

Special emphasis will be laid upon two series of projects or farm schools — one for pruning and one for spraying. This work contemplates having the operations of pruning and spraying, under field conditions, performed by members of the classes enrolled under the direction of the Extension Horticulturist.

ORGANIZATION AND MARKETS

HECTOR MACPHERSON, Extension Specialist in Organization and Markets
GUILFORD LANSING HURD, Field Organizer

The Extension Service Bureau of Organization and Markets takes up the investigation and marketing problems which are confronting the farmers of the State. One man is in the field constantly, working with the farmers who are attempting, through organization, to better their conditions. Other members of the staff are sent out on definite organization projects, such as creamery and cheese factory organization, and the establishment of egg circles for the marketing of poultry products. It is the aim of this department to help farmers organizations to get started in such a way as to accomplish the most good with the least possible risk and outlay.

Systematic instruction is being carried on through extension lectures and press bulletins, covering the whole field of marketing and rural credits.

POULTRY HUSBANDRY

CHARLES CHAUNCEY LAMB
Extension Specialist in Poultry Husbandry

Extension Poultry Husbandry involves all phases of the poultry industry as they should be applied on the farm.

The subjects, which are handled in the most practical way possible, are as follows: Breeds and Breeding; Feeding and Management of Growing Stock; Laying Hens and Market Fowls; Natural and Artificial Incubation and Brooding; and Care and Marketing of Poultry and Eggs.

PRESS SERVICE

CHARLES JARVIS McINTOSH, Editor Press Bulletin

The Extension press service assists in getting the valuable information developed by the research specialist out to the farms, factories, offices, homes, and schools where it is most needed. The monthly "Extension News" containing seasonal information in popular language is sent to the entire Extension mailing list consisting of some 20,000 names and to all newspapers and other periodicals of Oregon, and to a select list of about four hundred publications in the Northwest and other parts of North America. This information reminds farmers and other operators of the need of certain practice, and instructs them in the best methods of applying it. The department sends stenciled stories to all the dailies of the State once a week, a College News letter weekly to many of the leading metropolitan dailies of the United States, many specials to the newspapers in Portland as well as other places in the State, and comprehensive articles of technical nature to hundreds of class publications. The department also supervises student special correspondence. Special announcements of field work are furnished newspapers of the communities visited by field specialists.

CORRESPONDENCE COURSES

The aim of the Extension Service of the Oregon Agricultural College in offering correspondence courses is to reach those who cannot be reached otherwise, but who are seeking special information along some line of work which can be taught through correspondence. Courses are offered only in such subjects as will prove of practical benefit to those who are working, or who are interested, in the special lines of work taken up.

It is assumed in most of the courses offered that the student has only a general acquaintance with the subject taken up and that he desires a practical working knowledge of it. Subjects, therefore, will be presented in simple and direct language.

The following courses are offered:

1. Farm Accounting
2. Rural Law
3. Rural Economics
4. Advertising and Selling
5. Cooperative Accounting and Management
6. Business Organization and Management
7. Business Management for Women
8. Business Law
9. Bookkeeping
10. Accounting
11. Farm Arithmetic
12. Gas Engines
13. Concrete Construction on the Farm
14. Shop Arithmetic
15. Shop Drawing
16. Electricity and Magnetism
17. Heat and Its Mechanical Transformation
18. Farm Irrigation Practices
19. Farm Drainage

Additional courses in other subjects will be added from time to time as demands are made for them.

General Information

Student may begin correspondence courses at any time during the year.

No preliminary examination is required for enrollment.

Students desiring to enroll in any courses offered, should fill out the attached application blank and return to the Extension Service, Oregon Agricultural College, Corvallis, Oregon, with remittance required for the course.

Upon receipt of the enrollment blank and the remittance, enough assignments will be sent to the student to enable him to begin his work and continue it without interruption. Whenever a recitation is submitted by the students, one or more assignments will be sent to him. In this way the student always has on hand sufficient material for study.

Accompanying each assignment is a set of recitation questions or exercises. After completing the study of an assignment the student is required to answer the recitation questions or to work out the exercises and send them to the instructor in charge of his work. The recitation or exercise will be carefully examined by his instructor; errors corrected; necessary explanation made; all questions answered; the paper graded and returned to the student.

Remittance for fees, text-books, and notes should be made payable to Business Office, Oregon Agricultural College, and inclosed with application for the course.

The charges for the various courses are to defray, in part, the expense of providing texts, mimeographed notes, plates, postage or other material furnished, and in some cases the expense of an instructor where it is necessary for the instructor to meet with the class.

For specific information regarding correspondence courses write to the Extension Service for special circular.

ROSTER OF OFFICERS

and Non-Commissioned Officers, Military
Department, 1916-17.

COMMANDANT OF CADETS

Lieutenant Colonel VERNON A. CALDWELL, Infantry, U. S. Army

ASSISTANT COMMANDANTS OF CADETS

First Lieutenant RONALD D. JOHNSON, Cavalry, U. S. Army.

Post Commissary Sergeant CYRUS F. DUGGER, U. S. Army,
Retired.

Regimental Sergeant Major DENIS HAYES, U. S. Army, Retired.

CADET OFFICERS

Field Staff and Special Assigned

L. D. YATES, Colonel

C. A. FERTIG, Lieutenant Colonel.

P. R. SESSIONS, Captain and Adjutant.

T. C. VAN ORSDEL, Captain and Quartermaster.

A. D. HURLEY, Captain and Commissary.

A. G. SKELTON, Captain, Inspector of Competitive Drills.

P. E. CLARK, Captain, Asst. Instructor of Engineering.

F. H. CRANE, Lieutenant and Range Officer.

HEADQUARTERS COMPANY

P. R. Sessions, Captain

SUPPLY COMPANY

T. C. Van Orsdel, Captain

R. Gardner, Lieutenant

MACHINE GUN COMPANY

W. H. Ball, Captain

C. W. Meyers, Lieutenant

W. S. Caldwell, Lieutenant

FIRST BATTALION

Field and Staff

D. P. Spalding, Major

W. S. Zimmerman

Captains

F. A. Hayes, Co. "A"

H. M. Reynolds, Co. "B"

F. B. Brown, Co. "C"

N. C. Carnie, Co. "D"

Lieutenants

G. W. Vilas, Co. "A"

H. V. Levage, Co. "B"

E. E. Grubbe, Co. "C"

H. W. Cooper, Co. "D"

W. W. Boon, Co. "A"

I. French, Co. "B"

C. A. McCullum, Co. "C"

R. F. Shaw, Co. "D"

J. E. Proebstel, Co. "A"

SECOND BATTALION

Field and Staff

W. P. Arens, Major
D. M. Mayne, Lieut. and Adjt.

Captains

W. V. Clark, Co. "E"
F. W. Walton, Co. "F"
H. H. Hilton, Co. "G"
J. B. Wilson, Co. "H"

Lieutenants

J. M. Franklin, Co. "E"
H. Fellows, Co. "F"
H. E. Thomas, Co. "G"
W. Anderson, Co. "H"
C. G. Tanner, Co. "E"
C. R. Noles, Co. "F"
V. I. Basler, Co. "G"
L. S. Leavell, Co. "H"
L. C. Boldenweck, Co. "F"

THIRD BATTALION

Field and Staff

O. A. Mulkey, Major
W. H. Averill, Lieut. and Adjt.

Captains

C. L. Meyers, Co. "I"
J. D. McKay, Co. "K"
A. G. Seiberts, Co. "L"
W. A. Bailey, Co. "M"

Lieutenants

W. Wootan, Co. "I"
G. L. Kane, Co. "L"
C. A. Thompson, Co. "M"
W. L. Powell, Co. "I"
W. D. Brown, Co. "K"
G. M. Gragg, Co. "L"
J. T. Stephens, Co. "M"

NON-COMMISSIONED STAFF

Regimental Sergeant Major, Joseph Supple
Regimental Quartermaster Sergeant, L. W. Coleman
Regimental Commissary Sergeant, C. R. Hazeltine
Regimental Supply Sergeant, C. Shankland
Regimental Color Sergeant, L. C. Paine
Regimental Color Sergeant, R. Selph
Battalion Sergeant Major, V. Ramsdell
Battalion Sergeant Major, C. T. Gammon
Battalion Sergeant Major, D. F. McEwen

Company "A"

Sergeants

1st, H. H. Taylor
G. Estell (clerk)
L. K. Couch
C. L. Atwood
F. H. Benham
E. V. Storm

Corporals

W. H. Lankenau
E. G. Kirkwood
C. Steusloff
A. Friedenthal

Company "B"

Sergeants

1st, J. H. Clark
D. J. Bates
T. P. Cramer
W. J. Kocken
A. O. Leech
G. S. Strome

Corporals

W. W. Ball
L. G. Lyman
A. Ostrander
R. M. Bond
H. S. Christensen

Company "C"

Sergeants

1st, J. M. Underwood
M. O. Kurtz
R. K. Wilmot

Corporals

O. L. Byers
M. A. Davis
C. M. Moist

Company "D"**Sergeants**

1st, G. L. Jessup
D. A. Burleigh
F. M. Curry
E. A. Coe
A. C. L. Jetley
H. W. Thomas
J. Wilson

Corporals

J. O. Bettis
E. P. Frink
C. L. Palmer
J. B. Lorence
B. Holker

Company "E"**Sergeants**

1st, T. J. Porter
C. DuRette
E. Englund
A. Woodcock
S.H. Meyers

Corporals

D. W. Dye
P. E. English
F. Entermille
F. H. Nichols
J. H. Owens
M. S. Wright
F. B. Flannery
W. F. Lucas

Company "F"**Sergeants**

1st, L. T. Chellis
W. Johnson
W. S. Carpenter
F. S. Cramer
L. R. Guthrie
A. W. Oliver

Corporals

A. E. McClain
E. P. Hammond
W. H. Tuhlesing
A. M. Roseman
T. M. Walker
F. A. Roehrig
M. H. Ellisted

Company "G"**Sergeants**

1st, E. Porter
W. E. Gurkey
G. B. Sommers

Corporals

C. L. Annawalt
W. Dettering
F. A. Gilfilan
R. T. Kruzey
C. S. Nesbit

Company "H"**Sergeants**

1st, L. Happold
L. C. Chapman
H. F. Godel
C. O. Harris
C. H. Keil
J. G. Paul
E. C. Willey

Corporals

A. C. Brandes
R. C. Bodine
C. W. Grenfell
E. E. Hayslip
J. L. Holden
H. Mason
F. L. Reed
M. Wharton

Company "I"**Sergeants**

1st, W. D. Pine
H. W. Ferguson
C. F. Beatie
M. Newman

Corporals

R. A. Boss
J. D. Moberg
E. E. Radcliff
G. W. Thomas
O. E. Hartman
H. C. Ray

Company "K"**Sergeants**

1st, O. E. Osborn
A. O. Muen
S. W. Hanns
H. E. Ohara
H. E. Wheeler
A. G. Schoth

Corporals

J. S. Gloman
J. A. Thayer
E. Hunter
A. Hoffard
E. Chapman
H. Humfeld
A. T. Anderson

Company "L"**Sergeants**

1st, W. H. Gordon
A. H. Davidson
N. Firestone
C. McMIndes
S. C. Richey
J. Watson

Corporals

W. Bellingham
E. C. McKissick
R. I. Nichols
B. Reardon
E. G. Ricketts
G. N. Setterlee
L. Williams

Company "M"

1st, N. W. Reese
L. H. Bissett
Glen Corey
E. F. McCormack
C. E. Fullerton

Corporals

A. P. Agosti
G. Alexander
J. R. Beck
O. P. Dadman
E. C. Jory
L. A. Moss
A. P. Paroni
R. W. Russell

CATALOGUE OF STUDENTS

(The following abbreviations are used to indicate the course in which the student is registered and the classification within the course: Agri., Agriculture; C. E., Civil Engineering; Com., Commerce; H. E., Home Economics; E. E., Electrical Engineering; For., Forestry; L. E., Logging Engineering; Hi. E., Highway Engineering; I. E., Irrigation Engineering; I. A., Industrial Arts; M. A., Mechanic Arts; M. E., Mechanical Engineering; Min., Mining Engineering; Phar., Pharmacy; Fr., Freshman; Soph., Sophomore; Jr., Junior; Sr., Senior; Voc., Vocational; Opt., Optional; Spec., Special.)

GRADUATE STUDENTS

Name	Course	Home Address
Abell, Tracy (Montana State College)	Agri.....	Corvallis
Ahern, Merrie Ierne (Oregon Agricultural College)	Chem.....	Hugo
Allworth, Edward (Oregon Agricultural College)	Opt.....	Crawford, Wash.
Alverson, Vida (University of Washington)	Opt.....	Corvallis
Blackden, Ralph Silsby (Oregon Agricultural College)	Opt.....	Medford
Butler, Owen (Purdue University)	Agri.....	Culver, Indiana
Carey, Charles (Pennsylvania State College)	Agri.....	Lancaster, Penn.
Cooter, John Edward (Oregon Agricultural College)	Agri.....	Corvallis
Corbett, Ruth (Oregon Agricultural College)	H. E.....	Corvallis
Curry, Joseph Edmond (Oregon Agricultural College)	Agri.....	Olympia, Wash.
Dietsch, Frank John (Oregon Agricultural College)	Agri.....	Days Creek
Dobell, Lila Grace (Oregon Agricultural College)	H. E.....	Monmouth
Doolittle, Lydia (Oregon Agricultural College)	H. E.....	Dodge City, Kansas
Ferguson, Oscar Earl (Oregon Agricultural College)	Agri.....	Helix
Finch, Arthur William (Oregon Agricultural College)	Agri.....	Gardena, Calif.
Gibson, Vane (Oregon Agricultural College)	Agri.....	Little Rock, Ark.
Gilbert, Henry (Oregon Agricultural College)	Agri.....	Salem
Hanson, Manette (Oregon Agricultural College)	Opt.....	Corvallis
Haverstick, Russell Noah (Oregon Agricultural College)	Agri.....	Cashmere, Wash.

Name	Course	Home Address
Hawkins, Leon Abbott..... (New Hampshire College)	Agri.....	Holderness, N. H.
Howell, Herbert..... (Oregon Agricultural College)	Agri.....	Portland
Johnson, Anna Marie..... (Oregon Agricultural College)	H. E.....	Albany
Kadderly, Wallace La Due..... (Oregon Agricultural College)	Agri.....	Portland
Kelly, Glenn..... (Oregon Agricultural College)	Agri.....	Portland
Kimmell, Walter..... (University of Oregon)	Ind. Arts.....	Lebanon
King, Charles Allen..... (Oregon Agricultural College)	Ind. Arts.....	Ashland
McCormick, Andrew Cameron..... (Oregon Agricultural College)	Agri.....	Lebanon
McDonald, John Yates..... (University of Virginia)	Agri.....	Shenandoah Junction, W. Va.
Maris, Homer..... (University of Oregon)	Agri.....	Portland
Miller, Eva..... (Oregon Agricultural College)	Opt.....	Fillmore, Ill.
Miller, Fred Wilhelm..... (Ohio State University)	Agri.....	Girard, Ohio
Mix, Ira Delbert..... (Oregon Agricultural College)	Com.....	Independence
Montell, Edgar Whitney..... (Maryland State College)	Agri.....	Cantonsville, Md.
Moore, Merle..... (Oregon Agricultural College)	M. E.....	Corvallis
Olsen, Ruby Irene..... (Oregon Agricultural College)	Opt.....	Corvallis
Parpala, Tainie Armas..... (Oregon Agricultural College)	Agri.....	Astoria
Pavey, R. M..... (Ohio State University)	Agri.....	Columbus, Ohio
Peaslee, Willis Dhu Aine..... (Stanford University)	E. E.....	Grass Valley, Calif.
Reichart, Emanuel Henry..... (Oregon Agricultural College)	Opt.....	Corvallis
Seggel, Louis William..... (Oregon Agricultural College)	Opt.....	Jersey City, N. Y.
Selby, Halbert..... (Oregon Agricultural College)	Agri.....	Bellingham, Wash.
Shattuck, Obil..... (Oregon Agricultural College)	Agri.....	Corvallis
Smith, Ralph Henry..... (Kansas Agricultural College)	Agri.....	Corvallis
Steusloff, Dorathea Emily..... (Oregon Agricultural College)	H. E.....	Salem

UNDERGRADUATE STUDENTS

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Name	Course	Home Address
Stillinger, Charles Roy (University of Idaho)	Agri.....	Moscow, Idaho
Storz, Charles (Oregon Agricultural College)	Chem. Eng.....	Portland
Tillery, Genevieve (Oregon Agricultural College)	Opt.....	Corvallis
True, Mrs. Elsie Gay (Oregon Agricultural College)	Opt.....	Corvallis
Tufts, Miriam Olive (University of California)	H. E.....	Portland
Tulley, Stewart Wendell (Oregon Agricultural College)	Opt.....	Wallowa
Tweed, Robert (Oregon Agricultural College)	Agri.....	Corvallis
White, Samuel (Iowa State College)	Agri.....	Corvallis
Wight, Howard Marshall (Bates College)	Agri.....	Harrison, Maine
Woods, Lee Roy (Oregon Agricultural College)	For.....	Cottage Grove
Uyei, Nao (Oregon Agricultural College)	Agri.....	Oyodo, Japan

UNDERGRADUATE STUDENTS

Name	Course	Rank	Home Address
Abbott, Christine Gordon.....	H. E.	Soph.....	Roseburg
Abegg, Fred Auton.....	Agri.	Fr.....	Portland
Absher, Albert.....	Agri.	Fr.....	Mt. Grove, Mo.
Acheson, Fanny.....	Com.	Fr.....	Chehalis, Wash.
Acree, Louis Carlton.....	Agri.	Sr.....	Berkeley Ca.,
Adams, Belva Lee.....	Agri.	Soph.....	Hardman
Adams, Floyd Nelson.....	Agri.	Fr.....	Hardman
Adams, Herbert Gerald.....	Agri.	Fr.....	Portland
Agosti, Alfred.....	Hi. E.	Soph.....	Portland
Ahlson, Charles Boone.....	Agri.	Soph.....	Hillsdale
Akers, Robert.....	Agri.	Sr.....	Jacksonville, Ill.
Alcorn, William Vernon.....	Min.	Soph.....	Corvallis
Alderman, Clifford.....	Min.	Soph.....	McMinnville
Aldrich, Frederick.....	Com.	Fr.....	Albany
Alexander, Constance.....	H. E.	Fr.....	Portland
Alexander, Ethel Marjorie.....	H. E.	Fr.....	Salem
Alexander, Geo. Max.....	Agri.	Soph.....	Salem
Alexander, Harry James.....	Agri.	Fr.....	Chehalis, Wash.
Alicante, Marcos.....	Agri.	Fr.....	Svensen
Allan, Alex.....	Agri.	Soph.....	Dundee
Allen, Frederick John.....	Agri.	Sr.....	Portland
Allen, William Lester.....	M. E.	Spec.....	Sumpter
Allen, Rea.....	Opt.	Fr.....	Corvallis
Alpi, Rudolph.....	M. A.	Voc.....	Pasadena, Cal.

Name	Course	Rank	Home Address
Altimus, Otis Ellsworth.....	Hi. E.	Fr.....	Central Point
Altstadt, George John.....	For.	Fr.....	Portland
Alverson, Calvin.....	Agri.	Spec.....	Corvallis
Ament, Charles Wana.....	Min.	Soph.....	Grants Pass
Amerige, Violette Ann.....	Opt.	Voc.....	Boston, Mass.
Amerman, Warren Neuton.....	Agri.	Fr.....	Mt. Vernon, Wash.
Amis, Albert Hope.....	Agri.	Jr.....	Shandon, Cal.
Amort, Alvina Marie.....	H. E.	Fr.....	Corvallis
Anawalt, Clinton La Verne.....	Agri.	Soph.....	Jordan Valley
Anawalt, Elena.....	H. E.	Voc.....	Jordan Valley
Anderson, Albert Thomas.....	L. E.	Jr.....	Astoria
Anderson, Beverly.....	Agri.	Fr.....	Long Beach, Cal.
Anderson, Ellen Caroline.....	H. E.	Fr.....	Portland
Anderson, Harold Randolph.....	M. A.	Voc.....	Salem
Anderson, Henry.....	E. E.	Spec.....	Aberdeen, Wash.
Anderson, Howard Bradly.....	Com.	Voc.....	Midvale, Idaho
Anderson, Juliette Norma.....	Agri.	Jr.....	Portland
Anderson, Olof Ewart.....	Hi. E.	Spec.....	Astoria
Anderson, Otto Erwin.....	Agri.	Spec.....	Ilwaco, Wash.
Anderson, Virge Ingrid.....	H. E.	Sr.....	Aurora
Anderson, William.....	C. E.	Sr.....	Portland
Anderton, Edwin Cadwell.....	Agri.	Soph.....	Corvallis
Andrews, Abby.....	H. E.	Fr.....	Corvallis
Andrews, James.....	Com.	Spec.....	Myrtle Creek
Andrews, Winfield.....	Agri.	Sr.....	San Luis, Obispo, Cal.
Anttila, John.....	M. A.	Voc.....	Uleaborg, Finland
Archibald, John Raymond.....	Hi. E.	Soph.....	Albany
Arens, Winfried Bernard.....	Com.	Sr.....	New York, N. Y.
Ariess, Dorothy Crosfield.....	H. E.	Fr.....	Portland
Armitstead, Amy Isabella.....	H. E.	Soph.....	Portland
Armstrong, Fay.....	H. E.	Jr.....	Corvallis
Armstrong, Samuel Walter.....	M. E.	Fr.....	Bandon
Asbahr, Katherine.....	H. E.	Jr.....	Cornelius
Ascher, Felix George.....	I. A.	Fr.....	Birnamwod, Wis.
Ash, Minna Carolyn.....	Com.	Fr.....	La Grande
Atwood, Alice Lillian.....	H. E.	Fr.....	Corvallis
Atwood, Cyrus Leslie.....	Com.	Jr.....	Corvallis
Atwood, Ralph Guile.....	Agri.	Sr.....	Corvallis
Aumiller, Mildred.....	Agri.	Spec., North Yakima, Wash.	
Auterson, Jane Elizabeth.....	H. E.	Soph.....	Portland
Averill, William.....	Agri.	Sr.....	Corvallis
Axtell, Edward.....	Agri.	Sr.....	Corvallis
Axtell, Frances Joy.....	Opt.		Corvallis
Back, Carl Iver.....	Hi. E.	Fr.....	Marshfield
Bacon, Runa Elizabeth.....	Com.	Soph.....	La Grande
Bagley, Ferris.....	For.	Fr.....	Corvallis
Ba Htwa, Murgean.....	Agri.	Spec.....	Los Angeles, Calif.
Bailey, Willis Arthur.....	Agri.	Sr.....	Canada
Bailiff, Boyd.....	Com.	Fr.....	Corvallis
Bailiff, Edith Dorothy.....	Com.	Fr.....	Corvallis

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Bain, Walter Marion.....	Min.	Fr.	Portland
Baker, Alice Marie.....	H. E.	Fr.	Salem
Baker, Charles Eugene.....	Agri.	Fr.	Los Angeles, Calif.
Baker, Claude.....	Agri.	Spec.	Pilot Rock
Baker, Rufus William.....	M. E.	Fr.	Oregon City
Balderree, Elmer Wendall.....	L. E.	Fr.	Dallas
Baldwin, James Daniel.....	Agri.	Jr.	Blue Lake, Calif.
Ball, Harold.....	Agri.	Jr.	National City, Calif.
Ball, Waldo Whitney.....	Phar.	Spec.	Corvallis
Ball, Wilbur Herbert.....	M. E.	Sr.	Portland
Banks, Reno Parkman.....	Agri.	Spec.	Brookline, Mass.
Barta, Glenn.....	Agri.	Jr.	Selah, Wash.
Barker, Alice Cary.....	H. E.	Fr.	Athens, Maine
Barker, Guy Edwin.....	Com.	Fr.	Cove
Barker, Mary Elizabeth.....	H. E.	Jr.	Oakland, Calif.
Barklow, Ervin Earl.....	Agri.	Fr.	Norway
Barnard, Laurence.....	Agri.	Soph.	Tehachapi, Calif.
Barnes, Cecile Frances.....	H. E.	Spec.	Goldendale, Wah.
Barnett, Hollis Benjamin.....	Agri.	Voc.	Florence
Barratt, Marjorie Marian.....	H. E.	Soph.	Portland
Barrett, Gerald Joseph.....	Min.	Soph.	Portland
Bartness, Marie Louise.....	Opt.		Hood River
Barton, Bess.....	H. E.	Jr.	Puyallup, Wash.
Bartruff, Elmer Walter.....	Agri.	Sr.	Salem
Bartu, Frank.....	M. E.	Soph.	Crabtree
Barzee, Faye.....	Com.	Sr.	Corvallis
Bashor, Binnie Lowen.....	H. E.	Voc.	Corvallis
Basler, Vernon.....	Agri.	Sr.	Grants Pass
Bass, Chester Allan.....	Agri.	Sr.	Portland
Bates, Douglas Ivan.....	E. E.	Jr.	Portland
Baum, Francis Hutchins.....	Agri.	Jr.	Shoshone, Idaho
Bayley, Ralph Olaf.....	Agri.	Sr.	Pittsworth, Australia
Bayly, Carrie Margaret.....	Com.	Spec.	Eugene
Bayliss, Edwin John Charles.....	Agri.	Sr.	Carlton
Beagle, Glenn Elwood.....	Agri.	Fr.	Holland
Beall, Malcolm John.....	Agri.	Fr.	Portland
Beals, Erma Elizabeth.....	H. E.	Fr.	Corvallis
Beals, Oliver Kenneth.....	Agri.	Fr.	Corvallis
Beatie, Charles Fountain.....	Min.	Soph.	Oregon City
Bechen, Carl George.....	Agri.	Soph.	Hillsboro
Bechen, Ella.....	Com.	Soph.	Hillsboro
Bechen, Esther.....	Com.	Fr.	Hillsboro
Bechen, Martha Henrietta.....	H. E.	Sr.	Hillsboro
Beck, John George.....	Min.	Spec.	Astoria
Beck, James Ralph.....	Agri.	Soph.	Corvallis
Beckwith, Naomi.....	H. E.	Spec.	Portland
Beebe, Sadie Elizabeth.....	Com.	Fr.	Central Point
Beers, Ruby Evangeline.....	H. E.	Sr.	Corvallis
Behnke, Carl Henry.....	Agri.	Soph.	Sunnyside, Wash.
Bell, Fayne Cleora.....	Com.	Soph.	The Dalles

Name	Course	Rank	Home Address
Bellinger, Gordon Vankeuran	I. A.	Spec.	Moscow, Idaho
Bellinger, Wilbur Moore	Agri.	Soph.	Moscow, Idaho
Belt, Walter Kipling	Agri.	Fr.	Newport
Bendler, Georgina Bertha	H. E.	Soph.	Cornelius
Benham, Frank Norman	Agri.	Jr.	Seattle, Wash.
Benson, Otto Ingward	Phar.	Spec.	Everett, Wash.
Berchtold, Florence	H. E.	Soph.	Corvallis
Berg, Clifford John	Com.	Fr.	Walla Walla, Wash.
Berven, Edmund Sigurd	Min.	Jr.	Portland
Bettis, James Oliver	Agri.	Jr.	Corvallis
Bianco, Robert	Com.	Voc.	Roslyn, Wash.
Biles, George Albert	Hi. E.	Fr.	Portland
Billeter, Paul Edward	Com.	Fr.	Portland
Birch, Gracia Delle	H. E.	Sr.	Corvallis
Bishop, Leon	Min.	Soph.	Walla Walla, Wash.
Bissell, Rex Ide	I. A.	Soph.	Corvallis
Bissell, Ross Elder	Hi. E.	Jr.	Corvallis
Bissett, Lee Henry	Agri.	Jr.	Hebo
Bixby, Clarence Wilson	Com.	Sr.	Paulina
Bixby, John Snell	Agri.	Fr.	Freewater
Black, Emerson Perry	Agri.	Jr.	North Yakima, Wash.
Black, Kathleen	H. E.	Soph.	Medford
Blackman, Harold	M. E.	Fr.	Hood River
Blagg, Henry	E. E.	Sr.	Hood River
Blake, Marjorie Elizabeth	H. E.	Fr.	Salem
Blakely, Violet Rose	Com.	Voc.	Roseburg
Blanchard, Paul	M. E.	Fr.	Portland
Blomquist, Ruth	H. E.	Fr.	Shelley, Idaho
Boardman, Lucius Woodward	Agri.	Fr.	Chicago, Ill.
Bodine, Roger Campbell	L. E.	Soph.	Pasadena, Calif.
Bodle, Orval McKinley	E. E.	Fr.	Bay City
Boehmer, Karl	L. E.	Fr.	Portland
Boettcher, Lois Ione	H. E.	Voc.	Dorena
Bogard, Troy	Agri.	Jr.	Woodburn
Boggess, John	I. A.	Soph.	Veneta
Bohanon, Harvey Lee	I. E.	Fr.	San Diego, Calif.
Boies, Etta	H. E.	Sr.	Corvallis
Boldenweck, Louis Charles	Agri.	Spec.	Portland
Bolin, Frank Gerald	Agri.	Sr.	Portland
Bollen, Walter Beno	Agri.	Fr.	Portland
Bond, Mona	H. E.	Spec.	Halsey
Bond, Ruel	Agri.	Spec.	Corvallis
Bones, John William	C. E.	Sr.	Carlton
Bonner, George	Agri.	Soph.	London, England
Bonsel, Miriam	Opt.		Fresno, Calif.
Boon, Walter William	Agri.	Jr.	Portland
Boone, Earle	M. E.	Sr.	Toledo, Wash.
Boone, John	M. E.	Sr.	Toledo, Wash.
Boss, Reuben	Agri.	Soph.	Moxee City, Wash.
Both, Julius	Agri.	Sr.	Rainier
Bower, Eva Louisa	Com.	Spec.	Warrenton

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Name	Course	Rank	Home Address
Bowes, Mary Jane.....	H. E.	Voc.	Aberdeen, Wash.
Bowie, William Purley.....	Hi. E.	Fr.	Roslyn, Wash.
Boyd, Russell James.....	Min.	Fr.	Bethel, Alaska
Boyer, Will.....	Min.	Sr.	Portland
Brach, August Theodore.....	Agri.	Fr.	Astoria
Bracher, Karl.....	For.	Spec.	Portland
Bracons, Enola.....	H. E.	Fr.	Portland
Bradbury, Harold Gardner.....	Agri.	Fr.	Port Angeles, Wash.
Bradford, Gordon M.....	Agri.	Fr.	Grants Pass
Bradley, Mrs. Pearl Rawson.....	H. E.	Fr.	Corvallis
Bragg, Clarence Harvey.....	Agri.	Soph.	Corvallis
Brainard, Edward Sherman.....	Agri.	Fr.	Long Beach, Calif.
Brandes, Alan Carl.....	Min.	Soph.	Portland
Branstetter, Myrtle Esther.....	Phar.	Fr.	Echo
Branthoover, Lester Lee.....	Com.	Sr.	Payette, Idaho
Braun, Elsie.....	H. E.	Fr.	Portland
Breese, Roy Arthur.....	Agri.	Fr.	Red Bluff, Calif.
Breithaupt, Alva.....	Agri.	Soph.	Portland
Brennan, Andrew Frank.....	For.	Soph.	Boise, Idaho
Brewer, Loulin.....	Agri.	Fr.	Chemawa
Brewer, Ruth.....	H. E.	Fr.	Chemawa
Briggs, Louis Merle.....	Agri.	Soph.	Corvallis
Brinckerhoff, Ethel Anita.....	H. E.	Jr.	Piedmont, Calif.
Brittan, Joe Moore.....	Agri.	Fr.	Wilson, Mont.
Brogden, Cecil Myra.....	H. E.	Sr.	Hillsboro
Brokaw, Harold Hazzard.....	Agri.	Soph.	Whittier, Calif.
Brong, Paul.....	Min.	Fr.	Portland
Brooke, John Rutter.....	Min.	Jr.	Vancouver, Wash.
Brookhouse, Anna Bell.....	Com.	Spec.	Portland
Brown, Edward Guy.....	Com.	Soph.	New York City, N. Y.
Brown, Ellis Oliver.....	Agri.	Fr.	Drewsey
Brown, Francis Bolden.....	Agri.	Sr.	Crystal
Brown, Frances Roberta.....	H. E.	Voc.	Haines
Brown, Frank Kimball.....	Agri.	Fr.	Salem
Brown, Harrington.....	Agri.	Jr.	Los Angeles, Calif.
Brown, Joseph Willard.....	Agri.	Voc.	Shedd
Brown, Lark Olof.....	Agri.	Spec.	Warrenton
Brown, Walter.....	Com.	Soph.	Medford
Bryan, Elaine.....	H. E.	Fr.	Portland
Bryan, Leon Horan.....	Agri.	Fr.	Fort Jones, Calif.
Brye, Irene Anna.....	H. E.	Fr.	Auburn, Calif.
Buchanan, Raymond Dean.....	Com.	Fr.	Halfway
Budelier, Clarence.....	L. E.	Sr.	Rock Island, Ill.
Buell, Chester Albert.....	Com.	Fr.	Forest Grove
Bullis, Deloss Everett.....	Min.	Sr.	Payette, Idaho
Burk, Clifford Glenn.....	Hi. E.	Fr.	Bonanza
Burk, Earl Wager.....	Agri.	Fr.	Oregon City
Burke, Hazel.....	Com.	Voc.	Cambridge, Idaho
Burkhart, George Lake.....	I. A.	Spec.	Goldfield, Nevada
Burleigh, Donald Miller.....	M. E.	Jr.	Redmond

Name	Course	Rank	Home Address
Burley, Stephen Brace.....	M. A.	Voc.	La Grande
Burnap, Florence De Ette.....	H. E.	Fr.	Corvallis
Burnside, Julian Bates.....	Agri.	Jr.	Seattle
Busch, George.....	Agri.	Fr.	Portland
Bush, Zetta Zeretta.....	H. E.	Soph.	Hoskins
Buttervich, Vincent Floyd.....	Com.	Voc.	Fairbanks, Alaska
Byers, Oscar.....	For.	Jr.	Portland
Bysack, Bhupendra Nath.....	Com.	Fr.	Calcutta, India
Cady, Allen.....	Phar.	Soph.	Corvallis
Caldwell, Harold.....	I. A.	Fr.	Pomona, Calif.
Caldwell, Ruth Florence.....	H. E.	Soph.	Bend
Caldwell, Wally Strain.....	Hi. E.	Jr.	Pomona, Calif.
Calkins, Claude Clark.....	Agri.	Sr.	Dallas
Calvert, Donald Lee.....	Min.	Fr.	Grants Pass
Campbell, Cora Alice.....	H. E.	Soph.	Roseburg
Campbell, Donald Neil.....	Com.	Soph.	Portland
Campbell, Fannie Marie.....	Com.	Jr.	Roseburg
Campbell, Johnnie Luther.....	For.	Voc.	Lebanon
Campbell, John Norman.....	Min.	Fr.	Portland
Campbell, Tom Parker.....	For.	Soph.	McMinnville
Cantrall, Otto Lamar.....	E. E.	Fr.	Ruch
Carl, Wilbur.....	Com.	Fr.	Portland
Carlson, Arthur Albert.....	E. E.	Fr.	Portland
Carlson, Howard.....	Com.	Fr.	Butte, Mont.
Carnes, Deirdre.....	H. E.	Fr.	North Powder
Carnie, Norval Craigie.....	Agri.	Sr.	Chicago, Ill.
Carpenter, George Washington.....	M. E.	Jr.	Washougal, Wash.
Carpenter, Philip Lorenzo.....	I. A.	Fr.	New Plymouth, Idaho
Carpenter, Walter Squire.....	Agri.	Jr.	Ashland
Carroll, Richard Eldon.....	Phar.	Fr.	Harrisburg
Carson, Willard Franklin.....	M. E.	Fr.	Toledo
Carswell, John William.....	Hi. E.	Soph.	Roseburg
Carter, Claire Mary.....	H. E.	Soph.	Aberdeen, Wash.
Carter, Hallie Lenore.....	H. E.	Sr.	Corvallis
Carter, Harold Samuel.....	Hi. E.	Fr.	Drain
Carter, Lloyd Frank.....	E. E.	Fr.	Portland
Carver, Fay.....	Opt.		Phoenix
Case, Mary Leota.....	Agri.	Fr.	Corvallis
Case, Theodore Dwight.....	Agri.	Sr.	Klamath Falls
Castater, Ralph Martin.....	Phar.	Spec.	Parma, Idaho
Castle, Carrie Ethel.....	H. E.	Jr.	Wauseon, Ohio
Chambers, Dorothy.....	H. E.	Soph.	Newberg
Chapman, Earl Hoyting.....	For.	Soph.	Rivera, Calif.
Chapman, John Cecil.....	Min.	Jr.	Sheridan
Chase, Elmo Barry.....	Agri.	Soph.	Eugene
Chatterjee, Nripen.....	M. E.	Soph.	Darjerling, India
Chellis, Lawrence True.....	I. A.	Jr.	Astoria
Childs, Dorothy Ellen.....	H. E.	Spec.	Independence
Chipman, Merlin Robert.....	Phar.	Fr.	Corvallis
Christensen, Hazel.....	H. E.	Soph.	Portland

Name	Course	Rank	Home Address
Christensen, Henry Noris.....	Agri.	Soph.	Portland
Christian, Gertrude.....	H. E.	Fr.	Portland
Christian, William Arthur.....	Agri.	Fr.	Placerville, Calif.
Christiansen, Lulu Marie.....	H. E.	Fr.	Chinook, Mont.
Church, Leighton.....	E. E.	Fr.	Grizzly Bluff, Calif.
Churchill, Leigh Howard.....	Agri.	Jr.	Corvallis
Churchman, Tressa.....	Com.	Sr.	Corvallis
Clark, Doris Aileen.....	H. E.	Jr.	Portland
Clark, James Holbert.....	Agri.	Jr.	Mattoon, Ill.
Clark, Ola LaMoine.....	H. E.	Sr.	Salem
Clarke, Percy Elmo.....	I. E.	Spec.	Albany
Clarke, William Victor.....	Agri.	Sr.	Laytonville, Calif.
Clausen, Emma Christina.....	H. E.	Soph.	The Dalles
Close, Wilbur.....	Agri.	Sr.	Lawrenceville
Coe, Earl Alphonso.....	Agri.	Jr.	Portland
Coffey, Wilson Bryan.....	Agri.	Soph.	Portland
Cohen, Benjamin Bernard.....	Agri.	Sr.	Sniela, Russia
Cohill, Victoria.....	H. E.	Fr.	Portland
Cole, Harry Julius.....	Com.	Soph.	Emporia, Kansas
Cole, Maple Lucile.....	H. E.	Fr.	Canby
Cole, William Sidney.....	Agri.	Soph.	Portland
Coleman, Lloyd Wilbur.....	Agri.	Jr.	Berkeley, Calif.
Coleman, Ralph Orval.....	Agri.	Jr.	Newport
Coman, Ellis.....	Log. E.	Soph.	Covina, Calif.
Condit, Craig Cuyler.....	Agri.	Fr.	Fairbanks, Alaska
Conklin, Donald Vernon.....	Agri.	Fr.	Ontario
Conklin, Philip Arthur.....	M. E.	Fr.	Pasadena, Calif.
Conn, George.....	Agri.	Fr.	Cove
Connell, Arthur Wood.....	Agri.	Soph.	Hillsboro
Conner, Edna Clara.....	H. E.	Sr.	Sheridan
Conner, Evangeline.....	Opt.		Corvallis
Coniff, Martin Luther.....	Com.	Spec.	Spokane, Wash.
Cooper, Altha Opal.....	Com.	Soph.	Corvallis
Cooper, Howard Wesley.....	E. E.	Jr.	Milwaukie
Coppock, Jessie.....	Com.	Spec.	Dufur
Corbett, Ruth Lillyn.....	H. E.	Sr.	Corvallis
Cordelle, Howard Albert.....	E. E.	Fr.	Weiser, Idaho
Corey, Glen.....	E. E.	Jr.	Hood River
Corl, Miriam Elizabeth.....	H. E.	Fr.	Corvallis
Cornell, Carroll Milford.....	M. E.	Fr.	Grants Pass
Cornell, Ivan Robb.....	Agri.	Spec.	Portland
Corrie, John Quincy.....	Agri.	Fr.	Corvallis
Corthell, Elden Sweet.....	Agri.	Fr.	Jacksonville
Corum, Curtis Lee.....	Min.	Jr.	The Dalles
Cory, William McKinley.....	Agri.	Soph.	Etna Mills, Calif.
Cottom, Kenneth Klock.....	Agri.	Fr.	Los Angeles, Calif.
Couch, Leo King.....	Agri.	Jr.	Wallowa
Couch, Roy.....	Agri.	Jr.	La Grande
Counts, Wilda.....	H. E.	Jr.	Grants Pass
Covell, Margaret.....	H. E.	Fr.	Corvallis

Name	Course	Rank	Home Address
Cowley, Doris.....	Com.	Fr.	Central Point
Cowley, John Farnum.....	Min.	Soph.	Central Point
Cox, Clifford Bryan.....	Agri.	Fr.	San Bernardino, Calif.
Cramer, Floyd Samuel.....	M. E.	Soph.	Corvallis
Cramer, Olive Viola.....	H. E.	Voc.	Corvallis
Cramer, Theodore.....	Com.	Jr.	Grants Pass
Crane Jr., Fred Hovey.....	Agri.	Spec.	Fairview
Craven, Clair Glen.....	Agri.	Spec.	Meda
Crawford, Beatrice.....	Ccm.	Fr.	Salem
Crawford, James Arthur.....	For.	Sr.	Burlington, Iowa
Creel, June.....	H. E.	Soph.	Reno, Nevada
Crist, Ivan Paul.....	Com.	Spec.	Lompoc, Calif.
Crittenden, Marjorie.....	H. E.	Soph.	Portland
Cronemiller, Jr., Fred Parks.....	For.	Sr.	Lakeview
Cross, Stella Marie.....	H. E.	Soph.	Oregon City
Croswhite, John.....	Agri.	Sr.	Long Beach, Calif.
Crout, Mildred.....	H. E.	Jr.	Portland
Crowell, Chester Edward.....	Min.	Fr.	Takilma
Cuadra, John Amelius.....	Agri.	Voc.	San Francisco, Calif.
Cummins, Herschel Matthew.....	Phar.	Soph.	Melba, Idaho
Cunning, William.....	Agri.	Sr.	Baker
Cunningham, Bessie Alta.....	Com.	Spec.	Woodburn
Curl, Byron Arden.....	Min.	Fr.	Lebanon
Currin, Mary.....	H. E.	Sr.	Heppner
Currey, Herschel.....	Phar.	Spec.	Baker
Curry, Fred Martin.....	Phar.	Jr.	Albany
Curtis, Frank Griffin.....	Com.	Voc.	Marshfield
Curtis, Irene Lillian.....	H. E.	Fr.	Salem
Dadmun, Orin.....	Hi. E.	Soph.	Independence
Dahl, Ingwald Ferdinand.....	Agri.	Voc.	Vancouver, Wash.
Daigh, Charles Warren.....	Agri.	Fr.	Ontario, Calif.
Dailey, Chester Amos.....	Min.	Fr.	Portland
Dallas, Mabel Tabeaux.....	H. E.	Fr.	Corvallis
Daniel, Clarence.....	For.	Soph.	Monmouth
Daniels, William Chris.....	Agri.	Voc.	Hoquiam, Wash.
Daniells, Hugh Orren.....	Agri.	Soph.	Coeur d'Alene, Ida.
Darby, Una.....	H. E.	Soph.	Silverton
Darland, Zetta Ivy.....	H. E.	Spec.	Tulsa, Oklahoma
Darling, Jessie Ruth.....	Opt.		Corvallis
Darling, Lois Winnifred.....	H. E.	Spec.	Corvallis
Das Gupta, Surenda Nath.....	Agri.	Fr.	Calcutta, India
Davidson, Argus Harold.....	Agri.	Jr.	Meridian, Idaho
Davis, Bertha Marian.....	H. E.	Fr.	Marshfield
Davis, Edgar Willis.....	For.	Soph.	Corvallis
Davis, Kathleen.....	Opt.		Chinook, Wash.
Davis, LaNoel Bernard.....	Min.	Soph.	Salem
Davis, Laura.....	H. E.	Fr.	Gresham
Davis, Lois Grace.....	H. E.	Fr.	Myrtle Creek
Davis, Mabelle Josephine.....	H. E.	Sr.	Corvallis
Davis, Merton.....	Agri.	Spec.	Union

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Davis, Paul Wesley.....	For.	Fr.	Pasadena, Calif.
Dean, Sidney Ceralpha.....	For.	Fr.	Castle Rock, Wash.
Dearmin, Lillian Gertrude.....	Com.	Sr.	Baker
Dezendorf, Nelson Corkish.....	C. E.	Fr.	Portland
Deggendorfer, Aloysius Joseph.....	Agri.	Voc.	Portland
Denman, Augustus Nathan.....	Agri.	Fr.	Tacoma, Wash.
Denniston, Nellie.....	Opt.		McMinnville
Denny, Elwood Jack.....	Min.	Fr.	Sumpter
Detering, William.....	Min.	Soph.	Portland
Dick, Carolyn.....	H. E.	Fr.	Salem
Dickerson, Jesse Earl.....	Agri.	Sr.	Parma, Idaho
Dickinson, Leroy Foster.....	For.	Soph.	Castle Rock, Wash.
Didtel, Kathryn Margaret.....	H. E.	Fr.	Roseburg
Dillord, Wilma.....	H. E.	Fr.	Lebanon
Ding, Albert Poy.....	For.	Fr.	Portland
Ding, Edward Ralph.....	Agri.	Soph.	Portland
Ding, Frank Gow.....	E. E.	Soph.	Portland
Dinges, William.....	M. A.	Voc.	Corvallis
Donnell, Merrill Martin.....	Phar.	Fr.	The Dalles
Doolittle, George Barnett.....	Min.	Soph.	Corvallis
Dorn, Lois.....	H. E.	Fr.	Pasadena, Calif.
Dorris, Zeo.....	Agri.	Jr.	Central Point
Doty, Paul Edward.....	Agri.	Sr.	Pasadena, Calif.
Dougherty, Helen Frances.....	H. E.	Jr.	Baker
Douglas, Alfred Earle.....	Phar.	Soph.	Grants Pass
Douglas, Elizabeth Ruth.....	H. E.	Fr.	Marshfield
Douglas, Olin Eugene.....	Phar.	Sr.	Grants Pass
Doukas, Samuel James.....	E. E.	Soph.	Durham, N. C.
Down, John Roscoe.....	E. E.	Spec.	Joseph
Downey, Clair Jackson.....	Agri.	Fr.	Holloywood, Calif.
Dryden, Winfield Joseph.....	Com.	Spec.	Corvallis
Duggan, Claude Shaw.....	For.	Spec.	Burmester, Utah
Duncan, Earl Ernest.....	Min.	Soph.	Albany
Duniway, Robert Edward.....	M. E.	Soph.	Portland
Dunn, George Edwin.....	Agri.	Sr.	Ashland
Dunn, Mary Jane.....	Phar.	Soph.	Sumpter
Dunn, Ruffus Earl.....	Agri.	Voc.	Meda
Dunn, Wallace Wilkinson.....	Com.	Fr.	Corvallis
Dunning, Eva.....	H. E.	Soph.	Stanfield
Dunning, Marilla Carrie.....	H. E.	Soph.	Stanfield
DuPuy, Fred Kinsey.....	M. E.	Fr.	Portland
DuRette, Cecil Alexander.....	E. E.	Soph.	Gervais
Durham, Lee Lawrence.....	Agri.	Fr.	Hermet, Calif.
Durrell, Frank.....	C. E.	Fr.	Independence
Dutton, George Lawrence.....	Com.	Soph.	Concordia, Kansas
Dye, Evangeline.....	H. E.	Soph.	Oregon City
Dye, Everett Willoughby.....	M. E.	Jr.	Oregon City
Dyer, Reginald Lyon.....	Com.	Fr.	Metcalf, Arizona
Dykes, Thelma.....	H. E.	Fr.	Corvallis
Dyson, Lizzie.....	H. E.	Jr.	Dahlia, Wash.

Name	Course	Rank	Home Address
Eakin, John Bronson.....	Agri.	Soph.	Dallas
Eakins, Jack Marion.....	Agri.	Jr.	South Pasadena, Calif.
Eames, DeLin.....	M. A.	Voc.	Cordova, Alaska
East, Gertrude Dorothy.....	H. E.	Fr.	Salem
Easton, Cleo.....	H. E.	Jr.	Fresno, Calif.
Eaton, Frances.....	H. E.	Soph.	Independence
Eccles, Jack.....	Log. E.	Fr.	Ogden, Utah
Echdahl, Edward.....	Agri.	Fr.	Los Angeles, Calif.
Eckley, Mood.....	Min.	Fr.	La Grande
Eckley, Victor.....	Agri.	Soph.	La Grande
Edwards, James Homer.....	Agri.	Sr.	Monroe
Edwards, Lewis Hermon.....	Min.	Soph.	Monroe
Eikelman, John Albert.....	Agri.	Fr.	San Bernardino, Calif.
Eilertsen, William Timothy.....	Agri.	Fr.	Clatskanie
Eilertson, John.....	Log. E.	Spec.	Clatskanie
Eldredge, Elizabeth Adelaide.....	H. E.	Fr.	Tacoma, Wash.
Ellestad, Melvin.....	I. A.	Soph.	Central Point
Elliott, Dorcas May.....	H. E.	Soph.	Vancouver, Wash.
Ellis, Floyd Belden.....	Com.	Fr.	Dallas
Elmer, Edna Elmira.....	H. E.	Voc.	Mulino
Elmer, Elsie.....	H. E.	Voc.	Mulino
Elmer, Esther Stout.....	H. E.	Spec.	Corvallis
Elofson, Harry William.....	For.	Jr.	Salida, Colorado
Emery, Burdette.....	Agri.	Fr.	Portland
Emery, Jaunita.....	Com.	Spec.	Eugene
Emmett, Marion.....	Opt.		Dee
Emmett, Mildred.....	Opt.		Dee
English, Felix.....	Hi. E.	Fr.	Salem
English, Pennoyer.....	Agri.	Soph.	Salem
Englund, Eric.....	Agri.	Jr.	Portland
Entermille, Fred.....	Agri.	Soph.	Baker
Epps, Grady David.....	Min.	Soph.	Hot Springs, Ark.
Ericson, Lars.....	I. A.	Spec.	Corvallis
Eriksen, Norma Elizabeth.....	H. E.	Fr.	Hermiston
Esp, Hermann.....	Agri.	Spec.	Grays River, Wash.
Esselstyn, Morris Earl.....	E. E.	Fr.	Echo
Estes, Jack Doe.....	Com.	Voc.	Meridian, Idaho
Etsell, George.....	Agri.	Jr.	Corvallis
Evans, Dorothy.....	H. E.	Voc.	Roseburg
Evans, Rolley.....	M. A.	Voc.	McMinnville
Everett, Verne Frazier.....	Agri.	Fr.	Portland
Farlow, Elbert Jewett.....	Phar.	Fr.	Ashland
Farmer, Oliver.....	Agri.	Voc.	Shedd
Farrior, Jessie Broadhurst.....	Phar.	Spec.	Portland
Feike, Zelta Fern.....	H. E.	Soph.	Portland
Fellows, Hurley.....	Agri.	Jr.	Oregon City
Felton, Donnie Sherman.....	Com.	Jr.	Corvallis
Ferguson, Alice.....	H. E.	Soph.	Helix
Ferguson, Arthur Edwin.....	Agri.	Sr.	Helix
Ferguson, Homer.....	M. E.	Jr.	Portland
Ferguson, Roy Clayton.....	Com.	Soph.	Salem

Name	Course	Rank	Home Address
Ferguson, Vance Thomas	For.	Soph.	Portland
Ferguson, William	Com.	Fr.	Tipton, Iowa
Fertig, Charles Arthur	For.	Sr.	Hood River
Fiedler, Elizabeth Clare	H. E.	Fr.	Corvallis
Field, George Elias	Min.	Spec.,	Ottawa, Ont., Canada
Finney, John	Agri.	Jr.	Astoria
Firestone, Chester LaVerne	Agri.	Jr.	Vancouver, Wash.
Fish, Henry	M. E.	Soph.,	La Porte City, Iowa
Fisher, Bertha Marie	H. E.	Soph.	Haines
Fisher, Elmer	Min.	Soph.	Orchards, Wash.
Fisher, Harrison	Agri.	Spec.	Cincinnati, Ohio
Fisher, Henry Clay	Min.	Fr.	Orchards, Wash.
Fitts, Grace Elizabeth	H. E.	Spec.	Corvallis
Flaherty, Roland David	Com.	Fr.	Central Point
Flanagan, John William	Agri.	Spec.	San Gabriel, Calif.
Flanery, Floyd	Phar.	Sr.	Corvallis
Fleischman, Carl Julius	Com.	Spec.	Fairbanks, Alaska
Fletcher, Rita	H. E.	Fr.	Corvallis
Flippin, Thomas Joseph	Agri.	Sr.	Rainier
Floydstead, Harry	Com.	Jr.	Tacoma, Wash.
Fluharty, Arthur Lawrence	Agri.	Soph.	Corvallis
Foell, Harold Franklin	Agri.	Fr.	Los Angeles, Calif.
Foley, James Owen	Phar.	Soph.	Corvallis
Forbes, Alice	Com.	Fr.	Medford
Forbes, Ernest Stuart	M. E.	Voc.	Myrtle Creek
Forbis, Robert	Hi. E.	Soph.	Dilley
Ford, Hugh Pillsbury	M. E.	Jr.	Eugene
Ford, Kenneth	Agri.	Fr.	Union
Ford, Neal Kelly	M. E.	Jr.	Eugene
Forest, Bernice	H. E.	Jr.	Eugene
Forrey, Ira Huber	Agri.	Fr.	Pasadena, Calif.
Fortner, Philip Tuthill	Agri.	Jr.	Chicago, Ill.
Fox, LeRoy	Phar.	Fr.	Bend
Fox, Agnes Marie	Com.	Fr.	Bend
Fraley, Laurence Kiny	For.	Fr.	Portland
Franklin, John Morton	Agri.	Sr.	Seattle, Wash.
Franseen, Leonard Edward	Min.	Fr.	Portland
Fraser, Tom Henry	Agri.	Spec.	Corvallis
Frazier, Genevieve	Com.	Sr.	Salem
Freeland, Elaine Olive	H. E.	Spec.	Corvallis
Freeland, Elise Lucille	Agri.	Soph.	Corvallis
Freeland, Eugene Louis	Min.	Soph.	Parkplace
Freeman, Kelvin Burr	I. A.	Voc.	Portland
Freeman, Leonard Jay	Agri.	Fr.	Central Point
Freeman, Lola	H. E.	Fr.	Central Point
French, Irvine	Agri.	Soph.	Joseph
Freyler, Edna May	H. E.	Jr.	Corvallis
Fridley, Nettie May	H. E.	Sr.	Klondike
Friedenthal, Adolph Louis	Agri.	Soph.	Portland
Friedman, David	Agri.	Sr.	St. Charles, Ill.
Frink, Ellis Pearl	Min.	Soph.	Newberg

Name	Course	Rank	Home Address
Frizzell, Elsie Echo.....	H. E.	Voc.	Rickreall
Fu, Paul Chen.....	For.	Soph.	Washington, D. C.
Fudge, Laurence.....	E. E.	Soph.	Ballston
Fullerton, Charles Elwyn.....	Com.	Soph.	Olympia, Wash.
Fulton, Helen Louise.....	H. E.	Fr.	Corvallis
Funk, Anna Maud.....	H. E.	Sr.	Etna Mills, Calif.
Funk, Vera Magdalen.....	H. E.	Fr.	Corvallis
Futtrup, Ellen Marie.....	H. E.	Spec.	Vancouver, Wash.
Gain, Mrs. Mertie.....	Com.	Fr.	Corvallis
Gaither, Beal Mackey.....	Agri.	Fr.	Toledo
Galbraith, Alexander.....	Agri.	Jr.	Drymen, Scotland
Gammon, Earle Thomas.....	Agri.	Jr.	Hod, Calif.
Garbutt, John Donald.....	Agri.	Fr.	Sheridan, Wyoming
Gardner, Helen Corinna.....	H. E.	Fr.	Metzger
Gardner, Isaac George.....	E. E.	Soph.	Lansing, Mich.
Gardner, Vesta Hazyl.....	H. E.	Soph.	Salem
Garner, Robert Frankline.....	Agri.	Fr.	San Bernardino, Calif.
Garrett, Geary Everet.....	Com.	Soph.	Medford
Gatchell, Charles Barnard.....	I. A.	Sr.	Wakefield, Pa.
Gay, Ruth Leah.....	Com.	Fr.	Tipton, Iowa
Geller, Maurice Dave.....	Com.	Fr.	Portland
Genoud, Joseph Orlean.....	Phar.	Voc.	Camas, Wash.
George, Howard Stephens.....	Agri.	Fr.	Lewiston, Idaho
George, Marian Charlotte.....	Com.	Fr.	Lewiston, Idaho
Gibbs, Roy Harry.....	I. A.	Fr.	Gresham
Gildon, Elton Maurice.....	Agri.	Fr.	Albany
Gilfillan, Francois Arch.....	Phar.	Jr.	Delmar
Gilfillan, Hobart Ralph.....	M. E.	Fr.	Grants Pass
Gill, Whitney.....	Agri.	Fr.	Salem
Girard, Grace Winifred.....	H. E.	Fr.	Independence
Glaser, Elizabeth Carolyn.....	H. E.	Sr.	Lebanon
Glines, Emma Ione.....	H. E.	Jr.	Waldport
Glines, Hallie Winifred.....	H. E.	Jr.	Waldport
Gloman, Joseph Storey.....	Agri.	Soph.	Bellingham, Wash.
Glos, Karl Frederich.....	Com.	Spec.	Corvallis
Godard, Sherman Leslie.....	Agri.	Fr.	Corvallis
Godel, Howard Fisher.....	Agri.	Jr.	Portland
Goemanpott, Etta Oekeleine.....	H. E.	Soph.	Renville, Minn.
Golden, Arthur Edward.....	Agri.	Spec.	Corvallis
Golden, Zoe Hazel.....	H. E.	Sr.	Corvallis
Goodman, Linn Llewellyn.....	Agri.	Fr.	Freewater
Goodspeed, Ludella Whittlesey.....	H. E.	Spec.	Corvallis
Gordon, Will Hughes.....	Com.	Jr.	Portland
Gorman, Ralph Lee Roy.....	Min.	Fr.	Miller
Graf, Herman.....	M. E.	Sr.	Portland
Grafton, Jack Holmes.....	Agri.	Fr.	Chehalis, Wash.
Gragg, George Merle.....	Agri.	Sr.	Monroe
Graham, Earl Alvin.....	Phar.	Soph.	Emmett, Idaho
Granning, Burt.....	For.	Fr.	Theif River Falls, Minn.
Grasmoen, Otto Melvin.....	Hi. E.	Soph.	Jerseydale, Calif.
Graves, Leaman.....	Agri.	Jr.	Corvallis

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Name	Course	Rank	Home Address
Gray, Donald Monroe	Agri.	Voc.	Philomath
Gray, Mattie	Opt.		Corvallis
Grayheal, Carlyle West	Agri.	Soph.	Cashmere, Wash.
Green, Byron Marshall	Min.	Fr.	Lordsburg, Calif.
Green, Carl Clifford	Agri.	Sr.	Parkdale
Green, Dorr Dudley	Agri.	Sr.	Parkdale
Green, Ellsworth Nelson	Min.	Fr.	Lordsburg, Calif.
Greene, Marjorie May	H. E.	Spec.	Aberdeen, Wash.
Greer, Medic	Agri.	Jr.	Dundee
Gregson, Agnes Irene	H. E.	Fr.	Salem
Gregg, John David	Hi. E.	Soph.	Whittier, Calif.
Grell, Edward	Agri.	Voc.	Albany
Grenfell, Waldo	Min.	Jr.	Portland
Gribskoo, Maren	H. E.	Jr.	Junction City
Grimes, Etta Belle	H. E.	Sr.	Vancouver, Wash.
Grimm, Frank Lawrence	Opt.		Onalaska, Wash.
Grover, Helen Margaret	Phar.	Voc.	Newport, Wash.
Groves, Frank William	Agri.	Fr.	Lebanon
Groves, Roshal Meryl	Agri.	Fr.	Lebanon
Grow, Homer Wallace	Agri.	Jr.	Corvallis
Grubbe, Eugene Erle	Phar.	Jr.	Elkton
Gunn, Henry Martin	Agri.	Fr.	Hermiston
Gurley, Wayne	E. E.	Jr.	Canby
Guthrie, Eunice Jane	H. E.	Spec.	Corvallis
Guthrie, Leroy Roland	M. E.	Jr.	Corvallis
Haberer, Erwin Sam	For.	Soph.	Chicago, Ill.
Hadlock, Florence Beatrice	H. E.	Voc.	Beaverton
Hackett, Joe	Com.	Fr.	Corvallis
Hacking, Esther Lucretia	Opt.		Corvallis
Hagen, Harry	Hi. E.	Soph.	Ferndale
Hagenbuch, Irene	Opt.		Monmouth
Haley, Helen Baldwin	H. E.	Soph.	Olympia, Wash.
Hall, Eleanor Grace	Opt.		Union
Hall, Elmer Edwards	Min.	Spec.	Baker
Hall, John Wesley	For.	Fr.	Myrtle Point
Hall, Phila Henrietta	H. E.	Spec.	Fairfax, Vermont
Hall, Roy Jennings	Com.	Fr.	Olympia, Wash.
Hall, Thorland	Agri.	Fr.	North Yakima, Wash.
Hall, Willard	E. E.	Fr.	Newberg
Hamlin, Lucile Anna	Opt.		Corvallis
Hammond, Edmund	M. E.	Soph.	Portland
Hammond, Josephine Marion	H. E.	Jr.	Silverton
Hancock, Margaret Mae	Com.	Jr.	Forest Grove
Henley, Muhl Finley	Agri.	Spec.	Medford
Hanna, Mary Prudence	H. E.	Fr.	Milwaukee, Wis.
Hanns, Rosina	Com.	Fr.	Corvallis
Hanns, Satolli William	I. A.	Jr.	Corvallis
Hansen, William	Min.	Fr.	Portland
Hanson, John Milton	Agri.	Soph.	North Bend
Hanson, Manette	Opt.		Corvallis
Hanthorn, Faith	H. E.	Sr.	Portland

Name	Course	Rank	Home Address
Happold, Louie.....	E. E.	Jr.	Klondike
Harder, Esther.....	H. E.	Spec.	Corvallis
Harder, Lella Viola.....	H. E.	Spec.	Corvallis
Hargrove, Vivian.....	Com.	Fr.	Salem
Harlocker, Hugh.....	Agri.	Fr.	Coquille
Harnett, Frank Berrell.....	Agri.	Fr.	Long Beach, Calif.
Harrington, Harwin Fremont.....	I. A.	Spec.	Denver, Colorado
Harrington, Helen Ruth.....	H. E.	Soph.	Salem
Harris, Clifford Oscar.....	Agri.	Soph.	Portland
Harris, Fred.....	Agri.	Voc.	Butte, Montana
Harris, Herbert Virginius.....	E. E.	Fr.	Oregon City
Harris, James.....	Com.	Fr.	Butte, Montana
Harris, Milton.....	C. E.	Sr.	Portland
Harris, Ralph.....	Phar.	Fr.	Ashland
Harrison, Evadne May.....	H. E.	Soph.	Oregon City
Hart, Opal Frances.....	H. E.	Jr.	Corvallis
Harth, Philip.....	M. E.	Spec.	Roseburg
Hartman, Orville Ernest.....	Agri.	Soph.	Parma, Idaho
Harvey, Endora Mae.....	H. E.	Fr.	Corvallis
Harvey, Nora.....	H. E.	Fr.	Pendleton
Harvey, Paul.....	M. E.	Fr.	Portland
Hatch, Edward Barker.....	E. E.	Spec.	Corvallis
Hatfield, John.....	Com.	Fr.	Dixonville
Haumeser, Elsie.....	H. E.	Spec.	Portland
Hawkins, Joe Cephus.....	Agri.	Sr.	Sayre, Oklahoma
Hawley, Francell.....	H. E.	Fr.	McCoy
Hay, Simon DeLaganean.....	Agri.	Soph.	Kankakee, Ill.
Hay, William Chalmers.....	Phar.	Spec.	Lihae, Hawaii
Hayes, Frank.....	Agri.	Sr.	Pasadena, Calif.
Hayslip, Earl.....	For.	Soph.	Vancouver, Wash.
Hazeltine, Caryl.....	For.	Jr.	Oakland, Calif.
Heffron, Frederick Lee.....	I. E.	Fr.	Dickinson, N. Dak.
Heider, Lorena.....	H. E.	Soph.	Sheridan
Heiss, William.....	Agri.	Soph.	Pasadena, Calif.
Hembree, Lowell Townsend.....	I. A.	Fr.	LaFayette
Henderson, Marguerite.....	H. E.	Fr.	Trester
Henderson, William Wright.....	Agri.	Sr.	Aiea, Hawaii
Henricks, John Joseph.....	Agri.	Fr.	Acene
Henshaw, Merritt.....	E. E.	Fr.	Portland
Hesse, Victor Otto.....	Min.	Fr.	Portland
Hesseltine, Earl Handley.....	Agri.	Fr.	Tulare, Calif.
Hettinger, Harry Howard.....	Agri.	Fr.	Portland
Hewett, Melford Grant.....	E. E.	Fr.	Hubbard
Hewett, Roland Myrle.....	M. E.	Soph.	Hubbard
Heywood, Victor.....	Agri.	Spec.	Portland
Hiatt, Lewis Eugene.....	E. E.	Fr.	Portland
Hicks, Hazel.....	H. E.	Fr.	Weiser, Idaho
Higgins, Winfield Charles.....	Agri.	Jr.	Reno, Nevada
Highland, Clara May.....	Opt.		Goldendale, Wash.
Hildreth, Mrs. F. M.....	H. E.	Fr.	Corvallis
Hill, Merle.....	Agri.	Voc.	Eugene

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Name	Course	Rank	Home Address
Hill, Ralph William.....	Agri.	Spec.	Fruitvale, Calif.
Hilliar, Agatha Amelia.....	H. E.	Spec.	London, England
Hillyard, James William.....	Hi. E.	Fr.	Gresham
Hilton, Harold Henry.....	Com.	Jr.	Portland
Hindley, Henry Clarence.....	Agri.	Spec.	Ferndale, Calif.
Hippard, Wesley George.....	Agri.	Soph.	Belleville, Ill.
Hodgson, Marion.....	H. E.	Jr.	Ashland
Hoffard, Albert.....	Agri.	Spec.	Modum, Norway
Holden, Donald Franklin.....	Agri.	Fr.	Portland
Holden, Jesse Lonson.....	M. E.	Soph.	Portland
Holgate, Lana Claire.....	Opt.		Corvallis
Holker, Thomas Booth.....	Agri.	Soph.	Toston, Montana
Hollingsworth, Esther.....	Com.	Fr.	Newberg
Holloway, William.....	Agri.	Spec.	Brownsville
Holmes, Florence.....	Agri.	Fr.	Portland
Holmes, Henry Percy.....	Min.	Fr.	Corvallis
Holmes, Joseph Folger.....	Com.	Fr.	Berkeley, Calif.
Holmes, Paul.....	Agri.	Soph.	Los Angeles, Calif.
Golroyd, Imojean.....	H. E.	Fr.	Corvallis
Holt, Grace, Marie.....	H. E.	Fr.	Salem
Hooper, Byron Jennings.....	E. E.	Fr.	Seaside
Hooper, John Amos.....	E. E.	Sr.	Corvallis
Hopkins, Bertha Gertrude.....	H. E.	Fr.	Tulare, Calif.
Hopkins, Fred Edgar.....	Agri.	Fr.	Tulare, Calif.
Hopkins, Horace Llewellyn.....	Agri.	Soph.	Corvallis
Homer, Clyde Dale.....	Phar.	Voc.	Corvallis
Horning, Gladys Louise.....	H. E.	Fr.	Corvallis
Houck, Agnes Catherine.....	H. E.	Soph.	Portland
Houck, Roy Lester.....	E. E.	Sr.	Dallas
Hout, Frank Helm.....	Opt.		Corvallis
Howard, Dale.....	Agri.	Soph.	Astoria
Howard, Mabel.....	H. E.	Spec.	St. Helens
Howard, Robert.....	Com.	Fr.	Corvallis
Howe, George Barr.....	For.	Jr.	Lents
Howells, Marie Katherine.....	H. E.	Jr.	Medford
Howey, Hazel Delle.....	H. E.	Voc.	Corvallis
Howey, Iva May.....	H. E.	Sr.	Corvallis
Howey, Olive Mary.....	H. E.	Fr.	Corvallis
Hubbard, Clarissa Susan.....	H. E.	Fr.	Monroe
Hubbard, Clyde.....	Phar.	Soph.	Weiser, Idaho
Hubbard, Earl.....	Agri.	Soph.	Medford
Hubbard, Verda.....	H. E.	Soph.	Rickreall
Huber, Karl.....	Agri.	Fr.	Chehalis, Wash.
Huff, Arthur.....	Agri.	Fr.	La Grande
Huffaker, Wilford.....	Com.	Jr.	Idaho Falls, Idaho
Humfeld, Harry.....	Agri.	Spec.	Portland
Humphrey, Esther Cynthia.....	H. E.	Sr.	Portland
Hung, Tung Ming.....	Agri.	Jr.	Amoy, China
Hunt, Echo.....	Phar.	Spec.	Salem
Hunt, Esther Hazel.....	H. E.	Fr.	Cooston
Hunt, John Mudge.....	Agri.	Spec.	Westport

Name	Course	Rank	Home Address
Hunter, Elmer Dean	Agri.	Soph.	Portland
Hunter, William Gilbert	Agri.	Soph.	Island City
Hurley, Alton	Agri.	Sr.	Seattle, Wash.
Hurner, Frank Joseph	E. E.	Fr.	Carlton
Husbands, Esther Elizabeth	H. E.	Jr.	Hood River
Husbands, Myrtle Blakley	Com.	Soph.	Hood River
Hutchings, Albert	Min.	Soph.	Brownsville
Hutchins, Gladys Georgene	H. E.	Fr.	Portland
Hutchinson, Frank Cochrane	For.	Fr.	Salt Lake City, Utah
Hyams, Leo Klein	M. E.	Sr.	Portland
Hyatt, Waldron	For.	Fr.	Willamette
Hyde, James Beazley	Min.	Fr.	Portland
Ide, Fred Stitzel	Agri.	Fr.	Colville, Wash.
Ide, Marion Adeline	H. E.	Voc.	Mcminnville
Ide, Russel Sanders	Agri.	Soph.	McMinnville
Imrie, Lillian Mildred	H. E.	Sr.	Melrose
Ingalls, Darwin Albert	E. E.	Soph.	Grants Pass
Ingels, Hollis Glen	H. E.	Jr.	Salem
Ingham, DeEtta	Com.	Sr.	Portland
Ireland, Edith	M. E.	Fr.	Roseburg
Ireland, Orlin LeRoy	Phar.	Spec.	Roseburg
Irving, Ralph	Agri.	Soph.	Harney
Iverson, Esther Hazel	H. E.	Fr.	Portland
Jackson, Edgar Francis	Agri.	Spec.	Portland
Jackson, Helen Perkins	H. E.	Voc.	Troutdale
Jackson, Thomas Scott	I. A.	Spec.	Lorane
Jacobsen, Eve	Opt.		Portland
Jacoby, Carl Charles	For.	Sr.	Toledo, Wash.
Jacoby, Fred	Agri.	Jr.	Portland
Jaeger, Harry	Agri.	Soph.	Portland
Jamison, Joseph Thomas	Agri.	Spec.	Nebraska
Janes, Marjorie	H. E.	Sr.	Portland
Jaquith, Roy	Agri.	Soph.	Laurel
Jenkins, John Donald	Min.	Fr.	Portland
Jeppesen, John	Agri.	Voc.	Bacona
Jernstedt, Leonard	Agri.	Fr.	Carlton
Jernstedt, Maurice	Agri.	Sr.	Carlton
Jessen, Ralph Frank	Agri.	Fr.	Piedmont, Calif.
Jessup, George Leroy	Agri.	Fr.	Portland
Jetley, Arthur Lee	Hi. E.	Jr.	Narrows
Jewel, Eslie Florence	Com.	Sr.	Corvallis
Jewel, Herbert	Com.	Jr.	Portland
Jewel, Paul	Phar.	Fr.	Corvallis
John, Morris	Com.	Sr.	Corvallis
John, Helen	H. E.	Fr.	Corvallis
Johnson, Anna Marie	H. E.	Sr.	Albany
Johnson, Carl Stewart	Agri.	Sr.	Portland
Johnson, Clarence Benjamin	Agri.	Sr.	Hermiston
Johnson, Darrel DeLos	Com.	Sr.	Corvallis
Johnson, Edlie Marjorie	H. E.	Fr.	Hermiston
Johnson, John Iver	Agri.	Soph.	Winlock, Wash.

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Johnson, Lillian.....	H. E.	Sr.	Corvallis
Johnson, Loren Albert.....	Agri.	Fr.	Scappoose
Johnson, Louis Merll.....	Com.	Sr.	Portland
Johnson, Mrs. R. D.....	Opt.		Corvallis
Johnson, Ralph Eber.....	Agri.	Fr.	Alliance, Nebraska
Johnson, Willard.....	For.	Jr.	Corvallis
Johnson, Winfield Haaken.....	M. E.	Fr.	Falls City
Johnston, Charles.....	Log. E.	Fr.	Portland
Johnston, Clarence Edwin.....	Log. E.	Fr.	Portland
Johnston, William Waters.....	Agri.	Sr.	Corvallis
Jonasen, Olaf Robert.....	For.	Sr.	Rock Island, Ill.
Jones, Bernice.....	H. E.	Jr.	Santa Maria, Calif.
Jones, Charlotte Louise.....	Com.	Fr.	La Grande
Jones, Clement.....	Agri.	Fr.	Portland
Jones, Edward.....	M. A.	Voc.	Corvallis
Jones, Leon Kilby.....	Agri.	Sr.	Seattle, Wash.
Jones, Margaret Frances.....	H. E.	Spec.	Corvallis
Jones, Ronald Ewart.....	Agri.	Jr.	Brooks
Jory, Elmo Clayton.....	Phar.	Jr.	Salem
Justo, Robert Nolasco.....	Agri.	Soph.	Buenos Aires, Argt.
Kane, Gardner Lewis.....	Agri.	Soph.	Gardena, Calif.
Kaegi, Morrice.....	Phar.	Fr.	Wilbur
Kay, Hazel Etelka.....	Com.	Voc.	Holland
Keene, Roy Servais.....	Agri.	Soph.	Calgary, Canada
Keil, Carl Keoman.....	E. E.	Jr.	Cosmopolis, Wash.
Keith, Gaylord.....	Com.	Fr.	La Center
Keller, Eugene John.....	Agri.	Spec.	Grays Harbor, Wash.
Kellogg, Karl Francis.....	Agri.	Fr.	Eugene
Kellogg, Ralph Lester.....	Min.	Soph.	Portland
Kelly, Eva Emma.....	H. E.	Fr.	Portland
Kelly, Jean McIntyre.....	Agri.	Fr.	Portland
Kelly, Ruth.....	H. E.	Jr.	Portland
Kelsey, Hazel.....	H. E.	Fr.	Portland
Kennedy, David Honore.....	Agri.	Fr.	Portland
Kennedy, Ruth Henrietta.....	H. E.	Soph.	Corvallis
Kenny, Dora Lotella.....	H. E.	Soph.	Portland
Kenton, Ralph Milis.....	M. E.	Sr.	Albany
Keppinger, Verna Mildred.....	H. E.	Soph.	Gervais
Kerr, Genieve.....	H. E.	Fr.	Corvallis
Kerr, Lynette.....	H. E.	Spec.	Logan, Wash.
Ketchum, Ruth Elizabeth.....	H. E.	Sr.	Independence
Kiddle, Lyle Blair.....	Com.	Jr.	Island City
Kimpton, Rowland Russell.....	M. A.	Voc.	Toston, Montana
Kimzey, Robert.....	Com.	Soph.	Corvallis
King, James Allen.....	Agri.	Fr.	Corvallis
King, Philip Sheridan.....	Agri.	Sr.	Portland
Kingsley, Everette Ellenor.....	H. E.	Soph.	Hermiston
Kinnison, Grace.....	H. E.	Sr.	Charleston, Missouri
Kirkland, Robin, Watson.....	Agri.	Voc.	Westham Island, B. C.
Kirkwood, Emile Glenn.....	Agri.	Soph.	Salem
Knight, Maurice Ruhberg.....	Agri.	Fr.	Santa Ana, Calif.

Name	Course	Rank	Home Address
Knoll, Paul Xenophon.....	For.	Fr.....	Cedar Falls, Iowa
Knowles, Inez.....	H. E.	Jr.	La Grande
Kocken, Walter Joseph.....	Agri.	Jr.	Cleveland
Kohli, Chet Ram.....	Agri.	Soph.	Jammu, India
Koiner, Carl.....	Agri.	Spec.	Pasadena, Calif.
Koller, Frank Oswald.....	For.	Fr.	Astoria
Kooreman, Milton Abraham.....	M. E.	Soph.	Salem
Kraft, Harry William.....	Com.	Soph. ..	National City, Calif.
Krause, Cris Milton.....	Agri.	Soph.	Long Beach, Calif.
Kreitle, Margariete.....	H. E.	Soph.	Dallas
Kreps, Rhoda Jane.....	H. E.	Spec.	Laurel, Wash.
Krohn, LeRoy Bernard.....	M. E.	Fr.	Hood River
Krueger, Clarence William.....	E. E.	Jr.	Corvallis
Kruger, Herbert William.....	Min.	Sr.	Sherwood
Kubin, Junnie May.....	H. E.	Soph.	Salem
Kurtz, Martin.....	Com.	Jr.	Corvallis
Kyle, Kittie Gertrude.....	H. E.	Jr.	Corvallis
Lafky, Herman Ernest.....	Agri.	Soph.	La Grande
Lagus, Sigurd.....	Min.	Soph.	Astoria
Laing, Mabel Elsie.....	H. E.	Soph.	Boise, Idaho
Lamar, Howard Loring.....	Phar.	Fr.	Tillamook
Lamb, David.....	L. E.	Fr.	Corvallis
Lamb, Stewart Frank.....	Com.	Soph.	Albany
Lamoureux, Beatrice Josephine.....	Opt.	.....	Camas, Wash.
Lamson, Maude Eliza.....	H. E.	Sr.	Cottage Grove
Lance, John Harland.....	Com.	Soph.	Corvallis
Lance, Neely Samuel.....	Agri.	Jr.	Corvallis
Landram, Telete.....	H. E.	Soph.	Merced, Calif.
Landreau, Catharine Palmyre.....	H. E.	Fr.	Corvallis
Landreau, Charles.....	M. A.	Voc.	Corvallis
Landwehr, Walter Richard.....	Min.	Soph.	Cottage Grove
Lane, Bernice.....	H. E.	Jr.	Corvallis
Lane, Dorothy Elizabeth.....	H. E.	Sr.	Los Angeles, Calif.
Langell, Fred Chastain.....	Agri.	Fr.	Bly
Lankenau, Walter Henry.....	For.	Spec.	New York, N. Y.
Lankins, Hazel Claire.....	H. E.	Jr.	Hubbard
Lapham, Clarence Arthur.....	M. A.	Voc.	Toutle, Wash.
Larsen, Edward Louis.....	Com.	Fr.	Clatskanie
Larsen, Elmer Clarence.....	Com.	Fr.	Long Beach, Calif.
Larson, Ernest.....	Agri.	Voc.	Turner
Larsen, James Carl.....	E. E.	Soph.	Suver
Larson, Melvin Laverne.....	For.	Fr.	La Grande
Larson, Raymond Gilbert.....	Agri.	Soph.	Fairfield, Iowa
Lascar, Adhar Chandra.....	E. E.	Sr.	Calcutta, India
Lathrop, Willis.....	E. E.	Fr.	Portland
Lawson, James Elisha.....	Phar.	Fr.	McMinnville
Layton, Helen.....	H. E.	Fr.	Williams
Leavell, Leonard.....	Hi. E.	Soph.	Goldendale, Wash.
Leech, Archer Olin.....	M. E.	Jr.	Corvallis
Legg, Gladys Loretta.....	H. E.	Jr.	Portland
Legge, Roy.....	E. E.	Soph.	Gasport, Ind.

Name	Course	Rank	Home Address
Leland, Randolph Elliott	Agri.	Sr.	Los Angeles, Calif.
Lemieux, Diomede Nichols	Com.	Voc.	Wrangell, Alaska
Lemieux, Louis Charles	Com.	Voc.	Wrangell, Alaska
Lemmon, Oral Miskell	Phar.	Fr.	Corvallis
Lenox, Gladys	H. E.	Fr.	Klamath Falls
Leonard, Charlie Lloyd	Com.	Soph.	Scappoose
Le Peau, Nathaniel Xavier	Hi. E.	Fr.	Portland
Letelier, George Henry	Com.	Jr.	Mill City
Levage, Harry Vernon	Agri.	Sr.	Florence
Lewis, Garfield	I. A.	Fr.	Long Beach, Calif.
Lewis, John Mitchell	Agri.	Jr.	Corvallis
Lewis, Louise Mary	Com.	Jr.	Portland
Lewis, Wade Vernon	Min.	Fr.	Portland
Lewthwaite, Alexander	M. A.	Voc.	Portland
Likins, Joseph Irving	M. E.	Soph.	Portland
Lindal, Joseph Walter	Com.	Fr.	Blaine, Wash.
Lindeman, Harold Henry	Agri.	Soph.	Alhambra, Calif.
Lindquist, Eric Arthur	Hi. E.	Fr.	Poplar, Wis.
Lindsay, Alexander Lewis	Agri.	Sr.	Corvallis
Lindsay, Annie McDonald	H. E.	Jr.	Corvallis
Lindsay, Edith McOnie	H. E.	Spec.	Corvallis
Lindsay, Oleta Eulalia	H. E.	Fr.	Salem
Linn, Ralph	Agri.	Soph.	Three Forks, Mont.
Linville, Myrtle Harriet	H. E.	Soph.	Astoria
Livery, Anne	Com.	Fr.	Liberty, Nebraska
Little, Hubert	Com.	Soph.	McMinnville
Littler, Florence Elizabeth	H. E.	Jr.	Forest Grove
Lodell, Carl	Com.	Fr.	Portland
Lockwood, Chauncey Adair	E. E.	Fr.	Salem
Long, Carl Douglas	Com.	Fr.	Oakland
Loop, Charles Roy	Agri.	Soph.	McMinnville
Loop, Rosa Viola	H. E.	Spec.	McMinnville
Loosley, Merle John	Agri.	Fr.	Fort Klamath
Loo, Nai Fatt	Agri.	Soph.	Victoria, B. C.
Lorence, Jennings Bryan	M. E.	Jr.	Monmouth
Lorence, Ruby Ann	Opt.		Monmouth
Loughary, Elithe	H. E.	Jr.	Monmouth
Love, Annis	H. E.	Jr.	Junction City
Low, Charles Earl	Hi. E.	Soph.	Salem
Lowe, Allen Nelson	Opt.		Hopkinton, Iowa
Lowry, Edith Mae	H. E.	Fr.	Bellingham, Wash.
Lowry, Ralph William	Agri.	Sr.	Corvallis
Lucas, Elva Alice	Opt.		Dallas
Lucas, William Thomas	Min.	Soph.	Parkplace
Luebke, George	For.	Fr.	Toutle, Wash.
Luebke, James	M. E.	Soph.	Toutle, Wash.
Lundgren, Alice	H. E.	Soph.	Corvallis
Lundgren, Carl Oliver	Agri.	Jr.	Corvallis
Luper, Loren John	Agri.	Fr.	Tangent
Luxton, William	Com.	Sr.	Idaho Falls, Idaho
Lyman, Lee Percy	Agri.	Fr.	Cleveland, Ohio

Name	Course	Rank	Home Address
Lyman, Lloyd Gauvy.....	For.	Soph.	Cleveland, Ohio
McAllister, Everett William.....	Com.	Soph.	Portland
McBride, Lola Winifred.....	H. E.	Soph.	Eddyville
McCormick, Harl Craig.....	I. A.	Sr.	Drain
McCornack, Alice.....	H. E.	Jr.	Marcola
McCornack, Eugene Francis.....	Agri.	Jr.	Klamath Falls
McCornack, Helen Jvelyn.....	H. E.	Fr.	Marcola
McCullough, Addie.....	H. E.	Soph.	Portland
McCaffrey, Lawrence Martin.....	For.	Jr.	Dayton, Ohio
McCain, Ernest Vivian.....	E. E.	Soph.	Corvallis
McCain, Isla Mae.....	H. E.	Fr.	Jordan Valley
McCamant, Davis Dave.....	Agri.	Fr.	Portland
McCaw, Bessie Constance.....	H. E.	Fr.	Prescott, Wash.
McCaw, Ernest.....	Agri.	Fr.	Prescott, Wash.
McCaw, Marie Mae.....	H. E.	Fr.	Prescott, Wash.
McClain, Arthur.....	Com.	Soph.	Salem
McClanathan, Robert Allen.....	Hi. E.	Fr.	Delano, Calif.
McClintock, Leon Edward.....	Com.	Spec.	Roseburg
McClung, Samuel Hudson.....	Agri.	Spec.	Los Angeles, Calif.
McClure, Wallace Windom.....	Com.	Spec.	Sunnyside, Wash.
McCollum, Charles Adelbert.....	For.	Jr.	Salinas, Calif.
McCollum, John Edgar.....	For.	Sr.	Salinas, Calif.
McComb, Allan Wallace.....	Agri.	Fr.	Klamath Falls
McDevitt, Ray Carlton.....	Com.	Fr.	Sumpter
McEwen, Daniel Franklin.....	Agri.	Jr.	Portland
McFarland, Donald Clinton.....	Com.	Fr.	Meridian, Idaho
McGeorge, William Lee.....	C. E.	Sr.	Eugene
McGilchrist, George Millar.....	Agri.	Fr.	Salem
McIntosh, William Edward.....	M. E.	Spec.	Corvallis
McKay, James Douglas.....	Agri.	Sr.	Portland
McKee, Stuart.....	Agri.	Fr.	Selah, Wash.
McKissick, Joe.....	Com.	Soph.	Wallace, Idaho
McLagan, Eva Crystal.....	Opt.		Tangent
McLagan, Ruby May.....	Opt.		Tangent
McMaster, Cedric Stuart.....	Agri.	Jr.	Corvallis
McMindes, Elvin Winfield.....	Agri.	Jr.	Corvallis
McMindes, Laura Jackson.....	H. E.	Jr.	Corvallis
McMinn, Bryan Towne.....	M. E.	Jr.	Portland
McNeil, Alex.....	Agri.	Soph.	Houston, Scotland
McPherson, Walter Jay.....	M. A.	Voc.	Forest Grove
McRay, Lela LaMiza.....	Com.	Fr.	Sherwood
McRay, Virgil Page.....	Agri.	Voc.	Sherwood
Maag, Esther Verna.....	H. E.	Soph.	Salem
MacCrow, Hughretta Naomi.....	Com.	Spec.	Goldendale, Wash.
MacDonald, Helen.....	H. E.	Sr.	Corvallis
Mack, Laurence Wallace.....	I. A.	Sr.	Boulder, Colorado
Madsen, Alvin Hjalmar.....	Agri.	Spec.	Silverton
Magnuson, Hazel Johanna.....	H. E.	Soph.	Everett, Wash.
Mahan, Adelaide Stevens.....	H. E.	Fr.	Chicago, Ill.
Mainwaring, William Bernard.....	Com.	Soph.	Newberg
Malone, Earl Nicholas.....	Agri.	Soph.	Corvallis

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Maloney, Harold	Agri.	Fr.	Pendleton
Manning, Allen Munroe	E. E.	Fr.	Vancouver, Wash.
Manning, George Everett	Com.	Fr.	Amity
Manuel, Mildred Marian	H. E.	Sr.	Oakland, Calif.
Marshall, Julian Stephens	Min.	Soph.	Rapid City, S. D.
Martens, Maime	H. E.	Fr.	Chinook, Mont.
Martin, Elsie Pauline	H. E.	Soph.	McMinnville
Martin, Emily Cassandra	H. E.	Fr.	Corvallis
Martin, Glen Roy	Agri.	Soph.	McMinnville
Martin, Millard	Agri.	Spec.	Gardena, Calif.
Martin, Porter Wilson	M. E.	Sr.	Corvallis
Mason, Ben	M. E.	Jr.	Puyallup, Wash.
Mason, Earl George	For.	Soph.	Salem
Mason, Howard	Agri.	Soph.	Pasadena, Calif.
Masson, Robert Clifford	Agri.	Fr.	Eagle Creek
Mather, Irving Allen	Min.	Fr.	Dupont, Wash.
Matlock, Horace Wood	Agri.	Voc.	Canyon City
Mattox, Forrest William	M. E.	Fr.	Long Beach, Calif.
Maxwell, Grace Eleanor	H. E.	Fr.	Weiser, Idaho
Maxwell, Jane Irene	H. E.	Spec.	Eugene
May, Lula Litten	H. E.	Jr.	Monkland
May, Marcus Wayland	Agri.	Fr.	Pendleton
Mayfield, Frank	Agri.	Fr.	Central Point
Mayne, Harry McDonald	Agri.	Jr.	Salt Lake City, Utah
Meacham, Clifford	Agri.	Fr.	Weiser, Idaho
Meacham, Leta	H. E.	Jr.	Weiser, Idaho
Meade, William Vanard	M. E.	Fr.	Orengo
Mears, Raymond	Agri.	Spec.	Shedd
Meek, Margaret	H. E.	Sr.	Oakland, Calif.
Meier, Albert	Agri.	Jr.	Hillsdale
Meins, Harry	Agri.	Voc.	Prairie, Wash.
Meloy, George Everett	M. E.	Soph.	Corvallis
Meloy, Kathleen	H. E.	Spec.	Corvallis
Meloy, Lulu Vivian	H. E.	Spec.	Corvallis
Mentzer, Leland	I. A.	Soph.	Pendleton
Mercer, Helen Bernetta	H. E.	Sr.	Salem
Marriott, William Andrew	E. E.	Fr.	Milwaukie
Meshner, Sophie	H. E.	Jr.	Portland
Metzger, Floyd Sanford	Com.	Sr.	Gresham
Metzler, Ivan	Com.	Jr.	North Bend
Meyers, Cornelius William	Min.	Sr.	Portland
Meyers, Cyril Lawrence	Min.	Sr.	Portland
Meyers, Madeline Cathryn	Opt.		Portland
Mickelsen, Chester	Agri.	Voc.	Portland
Middlekauff, Ruth Helen	H. E.	Fr.	Corvallis
Miller, Clare Albert	E. E.	Fr.	Oregon City
Miller, Edwin Harvey	Min.	Sr.	Lexington
Miller, Eula Ellen	H. E.	Soph.	Corvallis
Miller, Grace	H. E.	Soph.	Corvallis
Miller, Helen Lavenia	H. E.	Sr.	Corvallis
Miller, Iva Curtis	Com.	Fr.	Union

Name	Course	Rank	Home Address
Miller, Jessie Kate.....	H. E.	Fr.	Harrisburg
Miller, Leslie Allan.....	Agri.	Fr.	Grand Forks, B. C.
Miller, Lloyd.....	E. E.	Fr.	Portland
Miller, Marjorie Modelle.....	Opt.		Portland
Miller, Milton Marion.....	Agri.	Fr.	Oregon City
Mills, Harold Milton.....	Agri.	Soph.	Corvallis
Mitchell, George Adamson.....	Agri.	Soph.	Upland, Calif.
Mjelde, Evelyn Marie.....	Opt.		Livingston, Montana
Moberg, James Dalgety.....	E. E.	Jr.	Astoria
Moffitt, Victor Lee.....	Com.	Voc.	Salem
Mohney, Curtis Gilliam.....	Min.	Fr.	Salem
Moist, Charles Morgan.....	Phar.	Soph.	Lebanon
Monger, Walter Victor.....	E. E.	Sr.	Parkplace
Moody, Charlotte Elizabeth.....	H. E.	Jr.	Pasadena, Calif.
Moody, Clifford.....	Com.	Voc.	Fairbanks, Alaska
Moore, Alice.....	Agri.	Sr.	Wichita, Kansas
Moore, Genevieve.....	H. E.	Fr.	Corvallis
Moore, Heman Harvey.....	Agri.	Spec.	Bend
Moore, Iva Grace.....	H. E.	Voc.	Corvallis
Moore, Leland.....	Agri.	Jr.	Gresham
Moore, Myra.....	H. E.	Jr.	Corvallis
Moore, Neva.....	Opt.		Corvallis
Moore, Tom Ormand.....	Agri.	Voc.	Corvallis
Moran, Paul Francis.....	Agri.	Fr.	Seattle, Wash.
Morcom, Minnie Etta.....	H. E.	Fr.	Corvallis
Morcom, Margaret Myrtle.....	H. E.	Fr.	Corvallis
Morgan, Beulah Inez.....	H. E.	Jr.	Corvallis
Morgan, Charles Leslie.....	E. E.	Fr.	Portland
Morgan, Walter John.....	Agri.	Sr.	Portland
Morley, Frances Marian.....	H. E.	Fr.	Silverton
Morrell, Alfred Wilbur.....	Agri.	Fr.	Arcata, Calif.
Morrill, Dorothy Clark.....	H. E.	Fr.	Vancouver, B. C.
Morris, David Clyde.....	Min.	Sr.	Edmond, Oklahoma
Morris, Homer.....	M. E.	Jr.	Yamhill
Morris, Mary Blanche.....	H. E.	Sr.	Tennant, Iowa
Morris, Ray August.....	Agri.	Soph.	Oregon City
Morrison, Ernest.....	E. E.	Fr.	Amatillo, Texas
Morrison, Eugene.....	Min.	Soph.	William
Morrow, William Harold.....	Agri.	Soph.	Portland
Morton, Ruth.....	H. E.	Jr.	White Salmon, Wash.
Moss, Lloyd Arthur.....	Agri.	Soph.	Hood River
Motz, Frederick Allen.....	Agri.	Sr.	Rock Island, Ill.
Moulton, Arthur Samuel.....	Agri.	Soph.	Portland
Mudge, Frank Raymond.....	Com.	Spec.	Knappa
Mulkey, Oren.....	E. E.	Sr.	Myrtle Creek
Muller, Ruth Margaret.....	H. E.	Soph.	Eugene
Munson, Robert Bliss.....	E. E.	Fr.	Milwaukee, Wisconsin
Murhard, Erroll Alexander.....	Agri.	Fr.	Portland
Murneek, Andrew Edward.....	Agri.	Sr.	Talsen, Russia
Murphy, Clara May.....	H. E.	Sr.	Eden
Murphy, Donald Ridgway.....	Agri.	Spec.	Salem

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Name	Course	Rank	Home Address
Murphy, Frank Thomas	Agri.	Sr.	Alhambra, Calif.
Murphy, Pat John	Min.	Spec.	Butte, Montana
Musgrave, Hester	H. E.	Fr.	Corvallis
Myers, Claire Edgar	Phar.	Fr.	Pendleton
Myers, Clarence William	Agri.	Sr.	Moneta, Calif.
Myers, Francis	M. E.	Jr.	Corvallis
Myers, Stanley Howard	E. E.	Jr.	Corvallis
Noderman, George Vincent	M. E.	Soph.	Turner
Namba, Masno	Agri.	Voc.	Portland
Neal, Martena Ruth	H. E.	Jr.	Hood River
Nesbitt, Clarence Scott	Com.	Jr.	Corvallis
Nestelle, Fred Washington	Agri.	Jr.	Seattle, Wash.
Nettleton, Harry	For.	Soph.	La Porte, Colorado
Neuhaus, Karl Frank	Agri.	Soph.	Ferndale, Calif.
Nevins, John	Agri.	Soph.	Long Beach, Calif.
Newman, Don	Phar.	Spec.	Portland
Newman, Erbine	Agri.	Sr.	Corvallis
Newman, Meier	Com.	Jr.	Portland
Newton, Bessie Fay	H. E.	Spec.	Corvallis
Niblen, Amy	H. E.	Jr.	Portland
Niblin, Ruth Calvina	H. E.	Soph.	Portland
Nichols, Benjamin Hodge, Jr.	M. E.	Soph.	Glendale, Calif.
Nichols, Dewey	M. E.	Fr.	Bonanza
Nichols, Floyd Myron	E. E.	Spec.	Corvallis
Nichols, Fred	Agri.	Jr.	Glendale, Calif.
Nichols, Rudolph	Agri.	Jr.	Corvallis
Nichols, Tressa Elizabeth	Opt.		Corvallis
Nielsen, Christian Dejgaard	Agri.	Voc.	Strellev, Denmark
Nielson, Sidney Maurice	Agri.	Soph.	Ferndale, Calif.
Nisley, Barbara Hoffman	H. E.	Soph.	Portland
Noble, Audrey Martha	H. E.	Fr.	Prineville
Nolan, Edward Victor	Com.	Sr.	Corvallis
Noles, Carl	Com.	Jr.	Dundee, Texas
Nordling, David Nathaniel	I. A.	Jr.	Colton
Norgren, Clarence	Agri.	Voc.	Vancouver, Wash.
Norman, Ruth Alma	Com.	Sr.	Milton
Norris, Rita Pearl	H. E.	Fr.	Burley, Idaho
North, David Starr	I. A.	Jr.	Monmouth
Norton, Harry Stewart	Com.	Soph.	Coquille
Norton, Lola	H. E.	Sr.	Corvallis
Norton, Walter Bert	Agri.	Sr.	Corvallis
Norton, Wenny Leonard	Agri.	Soph.	Corvallis
O'Harra, Herman Edward	Agri.	Jr.	Weston
Oliver, Alfred	Agri.	Jr.	Salem
Oliver, Burt Leroy	For.	Soph.	Diamond
Oliver, Mrs. Genevieve Gertrude	H. E.	Spec.	Diamond
Olsen, Edward Carl	Com.	Spec.	Portland
O'Neil, William James	For.	Sr.	Chippewa Falls, Wis.
Opedal, Martha	H. E.	Fr.	Silverton
Opstad, Otto Melvin	Agri.	Spec.	Blaine
Orem, Clarence Leslie	Min.	Fr.	Mollalla

Name	Course	Rank	Home Address
Orr, George David.....	Agri.	Fr.	Corvallis
Orr, Judson.....	I. A.	Fr.	Corvallis
Orr, Victor.....	Agri.	Jr.	Creswell
Osborne, Gifford Lawson.....	Min.	Fr.	Aurora
Osburn, Orren Edgar.....	E. E.	Jr.	The Dalles
Ostrander, Aubrey.....	Agri.	Jr.	Portland
Ostrander, Wilbur Wesley.....	M. A.	Voc.	Gold Beach
Owens, Iva.....	Com.	Spec.	Portland
Owens, Jacob Henry.....	Phar.	Spec.	Raymond, Wash.
Page, Chester Leroy.....	M. E.	Soph.	Whitehall, Montana
Paine, Charles.....	Com.	Jr.	Caldwell, Idaho
Paine, Allen.....	E. E.	Sr.	Portland
Paine, John.....	Agri.	Fr.	Caldwell, Idaho
Paine, Lincoln.....	Com.	Jr.	Caldwell, Idaho
Palmer, Bert Cecil.....	Com.	Soph.	Jordan Valley
Palmer, Charles Luther.....	Phar.	Sr.	Baker
Palmer, Lowell Elbert.....	Com.	Fr.	Jordan Valley
Palmer, Walter.....	Phar.	Spec.	Trinidad, Colorado
Parker, Alan Berthold.....	Agri.	Fr.	Pasadena, Calif.
Parker, Lewis.....	Agri.	Soph.	Needles, Calif.
Paroni, Anthony.....	Agri.	Jr.	Berkeley, Calif.
Parrish, Philip Hammon.....	Agri.	Sr.	Corvallis
Parsons, Arthur.....	M. A.	Voc.	Crabtree
Parsons, Cyril Malcolm.....	Hi. E.	Fr.	Bonanza
Parsons, Howard Brewster.....	Agri.	Fr.	Claremont, Calif.
Partin, Rae.....	H. E.	Jr.	Summer Lake
Patchett, Walter.....	Agri.	Fr.	Berkeley, Calif.
Patrick, Ethel.....	H. E.	Spec.	Roseburg
Patterson, Margaret.....	H. E.	Sr.	Portland
Patton, Harry Clifford.....	For.	Sr.	Maccleay
Patton, Palmer.....	Agri.	Jr.	Chicago, Ill.
Patty, Florence Valeria.....	H. E.	Fr.	Amity
Paull, James Gregory.....	Agri.	Jr.	Los Angeles, Calif.
Paulsen, Edward Meirer.....	For.	Sr.	Portland
Paulson, Oscar.....	Agri.	Fr.	Corvallis
Payzant, Charles Young.....	Agri.	Voc.	Chehalis, Wash.
Peaslee, Ruth Erickson.....	H. E.	Spec.	Corvallis
Peavy, Bradley Adelbert.....	For.	Fr.	Corvallis
Peeler, Royce Mallery.....	Phar.	Fr.	Seaside
Pendergrass, James Elmo.....	Phar.	Spec.	Clovis, Calif.
Pendergrass, Travis Ray.....	Phar.	Spec.	Clovis, Calif.
Pernot, Dorothy.....	H. E.	Spec.	Corvallis
Perry, Dale Alfred.....	Agri.	Fr.	Houlton
Perry, Jesse Lee.....	Hi. E.	Fr.	Wendling
Persinger, Clanton.....	Agri.	Voc.	Corvallis
Peterson, Esther Helen.....	H. E.	Fr.	Portland
Peterson, Inez Mae.....	Com.	Soph.	Corvallis
Peterson, May.....	Com.	Spec.	North Bend
Peterson, Robert.....	Agri.	Soph.	Aumsville
Phillips, Hazel Elsie.....	H. E.	Voc.	Izee
Phillips, James Robert.....	Agri.	Fr.	Corvallis

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Phillips, Walter Anderson.....	Com.	Jr.	Ashland
Pierce, Lloyd Byron.....	Agri.	Spec.	La Grande
Pierce, Walter James.....	Agri.	Fr.	Mount Vernon, Wash.
Pietzker, Henry Fred.....	E. E.	Jr.	Portland
Pike, Howard Elmer.....	Com.	Voc.	Corvallis
Pike, Mary.....	Com.	Voc.	Corvallis
Pimm, Charles Jesse.....	E. E.	Sr.	Philomath
Pinckney, Dunbar.....	Agri.	Sr.	Aberdeen, Wash.
Pine, William Douglas.....	Agri.	Jr.	Berkeley, Calif.
Pinkerton, Harry.....	Com.	Fr.	Corvallis
Pitman, John Elijah.....	Agri.	Sr.	Fairmont, Calif.
Pitney, Mary Eleanor.....	H. E.	Jr.	Junction City
Planta, Olive M. Francis.....	Agri.	Spec.	Nanaimo, B. C., Can.
Platt, Dwight Gilbert.....	M. E.	Sr.	Idaho Falls, Idaho
Plov, Nellie.....	H. E.	Voc.	Suver
Poling, Harold Wayne.....	Min.	Soph.	Dallas
Pollanz, Percy Edward.....	Agri.	Fr.	West Linn
Polson, Nellie Irene.....	H. E.	Jr.	Mount Vernon, Wash.
Poole, Elmer Gordon.....	Min.	Soph.	McMinnville
Poole, Leslie Erving.....	M. E.	Fr.	Corvallis
Poole, Roy Mabree.....	Min.	Soph.	Corvallis
Porter, Charles Orland.....	E. E.	Fr.	Ashland
Porter, Dale.....	E. E.	Jr.	McMinnville
Porter, Harry Baxter.....	M. E.	Sr.	Myrtle Creek
Porter, Nellie Bly.....	H. E.	Fr.	Silverton
Porter, Ted John.....	Agri.	Sr.	Halsey
Post, Clara Olga.....	Com.	Sr.	Blachly
Post, Elmer Oren.....	Agri.	Sr.	Blachly
Powell, Clares Clinton.....	E. E.	Fr.	Monmouth
Powell, DeWitt.....	Min.	Fr.	Corvallis
Powell, Lydia.....	H. E.	Sr.	Monmouth
Powell, Middleton Randolph.....	I. A.	Fr.	Fruitland, Idaho
Powell, Norval Hubert.....	E. E.	Fr.	Cottage Grove
Powell, Opal Erma.....	H. E.	Fr.	North Bend
Powell, Wilmer Dwight.....	Agri.	Soph.	Monmouth
Powers, Fred.....	I. A.	Sr.	Oakland
Powers, Verne Leona.....	H. E.	Soph.	Corvallis
Prather, Harry Albert.....	Phar.	Fr.	Klamath Falls
Prather, Marie Alma.....	Com.	Soph.	Corvallis
Prather, Mildred Esther.....	H. E.	Spec.	Corvallis
Prentiss, Sara Watt.....	H. E.	Sr.	Samia, Ont., Can.
Presley, Albert.....	Agri.	Fr.	Grants Pass
Preston, Edward Lincoln.....	Agri.	Soph.	Dallas
Prettyman, Ella Edythe.....	Opt.		Ashland
Price, Curtis.....	M. E.	Fr.	Springfield
Price, Elise Groves.....	H. E.	Fr.	Sifton, Wash.
Price, Inez Fay.....	H. E.	Spec.	Springfield
Price, Willard Watts.....	Com.	Fr.	Scappoose
Prindle, Ray.....	Min.	Sr.	Payette, Idaho
Proctor, Daryl Franklin.....	Agri.	Fr.	Salem
Proebstel, John Elden.....	Agri.	Soph.	Big Pine, Calif.

Name	Course	Rank	Home Address
Pryer, Clarence Edwin	Phar.	Sr.	Fortuna, Calif.
Pugh, John McKinley	Agri.	Fr.	Shedd
Purvine, Laurence	Com.	Soph.	Salem
Quant, Emily Alice	H. E.	Fr.	Albee
Quine, Herbert Donald	Com.	Fr.	Roseburg
Raab, Edith Belle	Opt.		North Bend
Radcliff, Edward Everett	Agri.	Soph.	Burbank, Calif.
Rains, Opal Irene	H. E.	Soph.	Oregon City
Ramsdell, George Votts James	Agri.	Jr.	Riverwood
Rankin, Charles	Agri.	Fr.	Los Angeles, Calif.
Ranks, Grace Miller	H. E.	Voc.	Springfield
Ransom, Myrtle Blanche	H. E.	Spec.	Battle Ground
Rapp, Leo	E. E.	Fr.	Roseburg
Ray, Howard	Agri.	Jr.	Roslyn, Wash.
Rayburn, Ralph Blanchard	Agri.	Voc.	Whittier, Calif.
Raymond, Thayer	H. E.	Soph.	Raymond, Wash.
Rearden, Barton	I. A.	Soph.	Corvallis
Rearden, Henry	Com.	Soph.	Corvallis
Reber, Albert Roy	Agri.	Jr.	Kansas City, Kansas
Records, Warren Willis	Agri.	Fr.	Umapine
Redmond, Agnes Theresa	H. E.	Jr.	Portland
Reed, Ada	H. E.	Jr.	Portland
Reed, Frank Leland	For.	Soph.	Hermet, Calif.
Reed, Maurice Albert	Agri.	Soph.	Fresno, Calif.
Reese, Neilsen Walker	Hi. E.	Jr.	Corvallis
Regnell, Lloyd Clifford	For.	Soph.	Hood River
Reichart, Zatalie Loucille	Com.	Fr.	Corvallis
Reichart, Robert Ray	Com.	Sr.	Corvallis
Reid, Ralph	Min.	Soph.	Portland
Reitsma, Catharina	H. E.	Fr.	Portland
Reitsma, Ray	M. E.	Voc.	Portland
Reynolds, Earl	Agri.	Soph.	La Grande
Reynolds, Gladys	H. E.	Fr.	Independence
Reynolds, Hugh Milton	Agri.	Sr.	Pasadena, Calif.
Rhodes, Solomon Martin	Agri.	Soph.	Conington, Tenn.
Rice, Clarence De Puy	Agri.	Jr.	Prineville
Rice, Gladys	H. E.	Soph.	Corvallis
Rice, Leaton Alanson	Min.	Jr.	Corvallis
Richard, Lorene	Com.	Sr.	Corvallis
Richardson, Elizabeth Clay	H. E.	Fr.	Portland
Richardson, Ora Lavone	H. E.	Fr.	Portland
Richey, Lester	For.	Soph.	Corvallis
Richter, Paul Eugene	Agri.	Soph.	Oak Grove
Ricketts, Ellsworth Gould	Hi. E.	Soph.	Portland
Rickson, Carl August	For.	Fr.	Portland
Riddell, Christine Elsie	H. E.	Spec.	Fruitvale, Idaho
Riddle, Julius	E. E.	Soph.	Roseburg
Riddle, Katheryn	H. E.	Spec.	La Grande
Ritchie, Douglas William	Agri.	Jr.	Corvallis
Roake, John Albert	Min.	Fr.	Oregon City
Robbins, George	I. A.	Spec.	Forsyth, N. C.

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Name	Course	Rank	Home Address
Roberts, Jessamy	H. E.	Sr.	Portland
Robertson, Mary Catharine.....	H. E.	Soph.	Portland
Robinson, George Vinton.....	C. E.	Soph.	Forest Grove
Robinson, Marian Isabelle.....	H. E.	Fr.	Seattle, Wash.
Roche, Chester	Agri.	Fr.	Brownsville
Rodgers, Gladys Belle.....	H. E.	Sr.	Gardena, Calif.
Rodgers, Hugh Graham.....	Com.	Jr.	Cupertino, Calif.
Roehrig, Frederick Austin.....	E. E.	Jr.	Pasadena, Calif.
Rogers, Hugh George.....	Agri.	Fr.	Independence
Rogers, Mary Alice.....	H. E.	Jr.	Corvallis
Row, Narayana	Com.	Jr.	Kudaravalli, India
Romans, Squire Bernard.....	Agri.	Spec.	Danburg, Conn.
Romig, Edith Marie.....	H. E.	Voc.	McCoy
Rose, Charles Duncan.....	Agri.	Fr.	Seattle, Wash.
Roseman, Arthur Mills.....	Agri.	Soph.	Corvallis
Rosenquest, Vera	H. E.	Fr.	Salem
Roser, Edgar Noell.....	E. E.	Fr.	Oskaloosa, Kansas
Ross, Frank Earl.....	Min.	Fr.	Central Point
Ross, Linden	Agri.	Soph.	Los Angeles, Calif.
Ross, Lucile	H. E.	Fr.	Irving
Rountree, Kenneth	Min.	Jr.	Hillsdale
Rugh, Gladys.....	H. E.	Spec.	Eugene
Rundell, Hugh Dean.....	M. E.	Soph.	Newberg
Runyan, Wilber Arthur.....	Hi. E.	Jr.	Portland
Rupert, Emily Mae.....	H. E.	Fr.	Portland
Ruch, Benjamin.....	C. E.	Sr.	Elgin
Russell, Charles	Agri.	Soph.	Pendleton
Russell, Fred Campbell.....	Agri.	Fr.	Pendleton
Russell, John Robert.....	Agri.	Fr.	Spokane, Wash.
Russell, Marjorie	H. E.	Fr.	Everett, Wash.
Russell, Ralph	Agri.	Soph.	La Grande
Ryan, Anna Louise.....	H. E.	Spec.	Auburn, Wash.
Sabin, Lynn Platt.....	Com.	Fr.	Grants Pass
Sanders, Lewis Claude.....	I. A.	Sr.	Corvallis
Sandon, Helen Beatrice.....	H. E.	Soph.	Corvallis
Sarna, Sajjan	Agri.	Fr.	Rawalpindi City, India
Satterlee, Guy Norman.....	Agri.	Spec.	Tidewater
Saunders, Edward Towle.....	Hi. E.	Soph.	Portland
Sawyer, Doris	H. E.	Jr.	Salem
Sawyers, Wilbur Ernest.....	Agri.	Fr.	Santa Barbara, Calif.
Sayrs, Carroll	Agri.	Spec.	Moro
Scea, Paul Waldie.....	Com.	Fr.	Milton
Scharzinger, Harold Henry.....	Agri.	Spec.	Oretown
Schley, Ringgold.....	Hi. E.	Fr.	Vancouver, B. C.
Schmidt, Ernest.....	Phar.	Voc.	Corvallis
Schminky, Harold Bruce.....	Hi. E.	Fr.	Eagle Creek
Schoeffel, Raymond Louis.....	I. A.	Sr.	Los Angeles, Calif.
Schooley, Paul Tafel Von.....	Agri.	Sr.	Santa Ana, Calif.
Schoth, Albert Joseph.....	Agri.	Jr.	Oregon City
Schott, Ralph	Hi. E.	Spec.	Condon
Schott, Rena	H. E.	Soph.	Salem

Name	Course	Rank	Home Address
Schoubor, Lee Morris	M. E.	Fr.	Portland
Schrepel, Oliver Henry	Agri.	Sr.	Corvallis
Schuerman, Fred	Com.	Fr.	McCloud, Calif.
Schumacher, John Herman	E. E.	Fr.	Mill City
Schwarz, George	E. E.	Soph.	Portland
Scott, Alfred Merle	M. E.	Soph.	Scotts Mills
Scott, Albert Miles	Agri.	Jr.	Ada
Scott, Clarence Vincent	Agri.	Sr.	Chicago, Ill.
Scott, Elmer Riggs	Agri.	Fr.	Ada
Searcy, Philip Thomas	M. A.	Voc.	Moro
Scho, Clarence	Agri.	Fr.	Silverton
Sefrit, Charles Leonard	Min.	Fr.	Bellingham, Wash.
Seibert, Emil	Com.	Fr.	Pendleton
Sein, Walter	Agri.	Fr.	Los Angeles, Calif.
Selover, Eleanor Marie	H. E.	Soph.	Klamath Agency
Selph, Raymond	Agri.	Jr.	Los Angeles, Calif.
Sessions, Philip Roddis	Com.	Sr.	Portland
Shake, Harold	Phar.	Spec.	Payette, Idaho
Shake, Rodney Hudson	Min.	Soph.	Payette, Idaho
Shank, Arthur Lincoln	Agri.	Jr.	Seattle, Wash.
Shankland, Albert	I. A.	Jr.	Estacada
Sharp, Anne	H. E.	Soph.	Yamhill
Shaver, Leonard Raymond	Com.	Soph.	Portland
Shaw, Cyril Glenalton	M. A.	Voc.	Astoria
Shaw, Ralph Fred	Agri.	Jr.	Portland
Shea, Esther Elizabeth	H. E.	Fr.	Portland
Shedd, Bertha Lucile	H. E.	Jr.	Shedd
Sheffield, Emma Rohrer	H. E.	Voc.	Newport
Sheffield, Frank Brizee	For.	Fr.	Newport
Shelley, Marjorie Louise	H. E.	Fr.	Everett, Wash.
Shelton, Wilbur Walter	Com.	Fr.	Pomeroy, Wash.
Sheppard, Don	Agri.	Fr.	Baker
Sheppard, Will	Com.	Soph.	Hood River
Short, Elaine	H. E.	Soph.	Corvallis
Short, Eugene Francis	Com.	Fr.	Long Beach, Calif.
Short, Mabel Eudora	H. E.	Spec.	Corvallis
Short, Vivian Frank	Agri.	Spec.	Corvallis
Shotwell, Jesse Gordon	Hi. E.	Fr.	Hermiston
Shutt, Clare Hubert	Agri.	Voc.	Aberdeen, Wash.
Sibley, Benjamin Cassins	Agri.	Soph.	San Bernardino, Cal.
Sieberts, Adolph Gustaff	Com.	Sr.	Portland
Simons, Flora	H. E.	Fr.	Tangent
Simpson, Allen Robert	Agri.	Fr.	Pendleton
Simpson, Charles Eldon	Com.	Fr.	Carrolls, Wash.
Simpson, Glenn	Agri.	Fr.	Ashland
Simpson, John Ernest Henry Jr., M. E.		Sr.	Portland
Simpson, Rodger Whittier	Opt.		Corvallis
Singh, Mahadeo	Agri.	Sr.	Hasanpore, India
Sinks, Lenora	H. E.	Fr.	Portland
Skelton, Albert	C. E.	Sr.	Corvallis
Skidmore, Maud May	H. E.	Jr.	Curtin

Name	Course	Rank	Home Address
Skow, Harvey Richard	Min.	Fr.	Corvallis
Slayton, Mabel Adaline	H. E.	Soph.	Prineville
Slayton, Mildred Lura	H. E.	Soph.	Prineville
Smily, James Raymond	E. E.	Fr.	Corvallis
Smilie, Robert Stanley	For.	Jr.	Oakland, Calif.
Smyth, Fred Wendel	Com.	Soph.	Diamond
Smith, Cecil Starr	Log. E.	Fr.	Portland
Smith, Doyle Bertis	Com.	Soph.	Salem
Smith, Elizabeth Frances	Com.	Fr.	Portland
Smith, Elva	H. E.	Jr.	Portland
Smith, Everett Lathrop	Agri.	Fr.	Pasadena, Calif.
Smith, Floyd Arthur	E. E.	Fr.	Lakeview
Smith, Grace Elizabeth	H. E.	Fr.	Portland
Smith, Harvey	Agri.	Jr.	Los Angeles, Calif.
Smith, Hazel Harriet	H. E.	Fr.	Hood River
Smith, Hubert	Phar.	Spec.	Clovis, Calif.
Smith, Kathryn Matilda	H. E.	Spec.	Marshfield
Smith, Leone Adell	H. E.	Jr.	Carnation
Smith, Lewis	E. E.	Fr.	Missoula, Montana
Smith, Madelon Maxwell	H. E.	Fr.	Hood River
Smith, Wendell	Agri.	Soph.	Jennings Lodge
Smith, Sterling William	E. E.	Fr.	Portland
Smith, Van Carr	Agri.	Fr.	Long Beach, Calif.
Smith, Wallace	Agri.	Soph.	Corvallis
Smith, Wilbur Joseph	M. E.	Soph.	Rainier
Snowberger, Fred	Phar.	Soph.	Payette, Idaho
Soden, Frances Jeanette	Com.	Soph.	Portland
Sodhi, Charn Singh	Com.	Sr.	Quetta, India
Somers, George Brooks	Min.	Jr.	Ft. Wayne, Ind.
Southern, Raymond Duncan	E. E.	Soph.	Brownsville
Southward, Walter Stone	Min.	Fr.	Le Grand, Calif.
Spain, Gail Elliott	M. E.	Fr.	Portland
Spalding, Anna Mary	Opt.		San Francisco, Calif.
Spalding, Donald Parker	For.	Sr.	Lowell, Mass.
Specht, Mabel	H. E.	Fr.	Portland
Spika, Edwin Axtel	Phar.	Spec.	Grand Junction, Colo.
Spindler, Walter Arthur	Agri.	Soph.	Portland
Spires, Elton Cyrus	Agri.	Fr.	Myrtle Point
Spires, Roy Leon	Hi. E.	Fr.	Myrtle Point
Spitzbart, Frieda Georgine	Opt.		Salem
Spranger, Fred Edward	Agri.	Fr.	Salem
Sprague, Hazel Emma	H. E.	Sr.	Corvallis
Spriggs, James Llewellyn	Agri.	Soph.	Portland
Staats, Vere Leslie	Phar.	Fr.	Airlie
Stafford, Royle Raymond	Agri.	Soph.	Altoona, Kansas
Staiger, Guy Alfred	Phar.	Soph.	Corvallis
Stalker, Harold	Min.	Fr.	Halfway
Stanley, C. Lewis	Agri.	Fr.	Pasadena, Calif.
Stanley, Lewis Adams	Com.	Spec.	Baker
Staples, Harvey Delbert	M. A.	Voc.	Astoria
Stark, Leslie	Com.	Jr.	Holdnege, Nebr.

Name	Course	Rank	Home Address
Stauff, Gladys.....	H. E.	Voc.	Cooston
Stebbins, Hazel Anna.....	H. E.	Voc.	Lordsburg, Calif.
Steel, Joseph Irvine.....	For.	Fr.	Portland
Steele, Isabelle Alice.....	H. E.	Fr.	Portland
Steele, Ruth.....	H. E.	Fr.	Creswell
Stegerwald, Andrew.....	Opt.		Corvallis
Steiger, Freda Amelia.....	H. E.	Spec.	Klamath Falls
Steininger, Maude Ellen.....	H. E.	Spec.	Molalla
Stelling, John Lloyd.....	Agri.	Soph.	San Jose, Calif.
Stephens, George Curtis.....	Phar.	Fr.	Arlington
Stephens, James Thomas.....	For.	Sr.	Hoquiam, Wash.
Stephens, Leslie Earl.....	M. E.	Fr.	Veneta
Stephenson, Mervyn.....	Hi. E.	Soph.	Condon
Steusloff, Claude.....	Agri.	Soph.	Salem
Stevens, Kenneth.....	Com.	Soph.	Albany
Stevenson, Harold.....	Agri.	Fr.	Halsey
Stewart, Harry James.....	Agri.	Soph.	Portland
Stewart, Ivan.....	Com.	Fr.	Fossil
Stewart, James Oscar.....	Agri.	Spec.	Lorella
Stewart, Robert Alexander.....	Agri.	Fr.	Portland
Stewart, Ruth.....	H. E.	Fr.	Portland
Stewart, Stanley Earl.....	Agri.	Soph.	Danington, Wash.
Stewart, Wallace Glenn.....	Phar.	Fr.	McMinnville
Stidd, Erma Phoebe.....	H. E.	Spec.	McDermott, Nev.
Stimpson, Laura Elaine.....	H. E.	Voc.	Corvallis
Stockton, Smith Patsy.....	Agri.	Fr.	Parma, Idaho
Stockwell, Martin Frank.....	Agri.	Fr.	Tacoma, Wash.
Stone, Adelia Olive.....	H. E.	Spec.	Asotin, Wash.
Stone, Herman Al.....	Agri.	Jr.	Woodburn
Stone, Walter Irving.....	For.	Fr.	Denton, Mont.
Storm, Earl Vasberg.....	For.	Jr.	Milton
Storrs, Isabella Garrison.....	Opt.		Pomona, Calif.
Storrs, Ruth Parsons.....	Opt.		Pomona, Calif.
Stovall, John Henry.....	Opt.		Philomath
Stow, William Raymond.....	Agri.	Soph.	Corvallis
Straight, Lois Emily.....	H. E.	Voc.	Lordsburg, Calif.
Strain, Stephanie.....	H. E.	Fr.	Portland
Straughn, Orson.....	Agri.	Jr.	Pendleton
Streiff, Albrecht.....	E. E.	Sr.	Hillsdale
Strief, Hazel Jean.....	H. E.	Fr.	Portland
Strome, Glenn Smyth.....	Agri.	Jr.	Eugene
Strome, Katherine Marcelle.....	H. E.	Soph.	Corvallis
Strong, Geoffrey.....	Agri.	Spec.	Myrtle Creek
Stroud, William Harold.....	Agri.	Jr.	Los Angeles, Calif.
Strowbridge, Howard.....	Agri.	Spec.	Portland
Struck, Martha Bertha.....	H. E.	Sr.	Lyle, Wash.
Stuart, Donald Bruce.....	E. E.	Fr.	Portland
Stuart, George Arnold.....	Com.	Voc.	Latourell Falls
Stutz, Lelia Bertha.....	H. E.	Fr.	Corvallis
Sumner, Lucien Herbert.....	Agri.	Voc.	San Diego, Calif.
Summers, Clement Moore.....	Opt.		Ashland

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Name	Course	Rank	Home Address
Supple, Joseph	Agri.	Jr.	Oakland
Sutherland, Frank Gillette	Agri.	Sr.	Honolulu, Hawaii
Swaggerty, James Granderson	Min.	Fr.	Salem
Swan, Harry Twiss	Min.	Soph.	Baker
Sweeney, Elynore Dorothea	H. E.	Fr.	Walla Walla, Wash.
Sweeney, Philips Brooks	Agri.	Soph.	Walla Walla, Wash.
Sykes, Elizabeth Cole	Opt.		Corvallis
Tait, John David	E. E.	Fr.	Corvallis
Tanner, Clifford Gilbert	Agri.	Sr.	Morro, Calif.
Tatham, Frank Selby	Com.	Soph.	Portland
Taylor, Charles Everett	Agri.	Fr.	Monroe, Wash.
Taylor, Fred Arthur	Com.	Fr.	Medford
Taylor, Herbert Harold	For.	Soph.	Lowell, Mass.
Taylor, Kenneth Somers	Agri.	Fr.	Glendale, Calif.
Temple, Roy	Agri.	Voc.	Pendleton
Terry, Robert	Agri.	Voc.	Carlton
Teutsch, William	Agri.	Fr.	Spokane, Wash.
Thacker, Richard Thomas	Agri.	Fr.	Harrisburg
Thayer, Jessie	H. E.	Jr.	Rainier
Thayer, John Alden	Agri.	Soph.	Rainier
Thiessen, Raymond Lee	Com.	Spec.	Milwaukie
Thomas, George Warren	Agri.	Jr.	Auburn, Ind.
Thomas, Herbert Franklin	L. E.	Spec.	St. Paul, Minn.
Thomas, Marie Laura	H. E.	Soph.	Auburn, Ind.
Thomas, Marvin	Agri.	Fr.	Alhambra, Calif.
Thomas, Ruby	H. E.	Voc.	Hillsboro
Thomas, Seymour	Agri.	Fr.	Alhambra, Calif.
Thompson, Benjamin Garrison	Agri.	Jr.	Shedd
Thompson, Cecil Adelbert	Agri.	Jr.	Stevensville, Mont.
Thompson, Mrs. George	Opt.		Corvallis
Thompson, Gertrude Luella	Opt.		Portland
Thompson, Josephine Sophia	H. E.	Fr.	Seaside
Thoms, Harold Wayne	Min.	Jr.	Scio
Thomson, Stanley Aaron	Phar.	Fr.	Astoria
Throne, Robert Franklin	M. E.	Sr.	Ashland
Tibbetts, Joe Wood	Min.	Fr.	Forest Grove
Tidball, Lynn Hudson	Agri.	Spec.	Corvallis
Tillery, Merle	Com.	Sr.	Corvallis
Tilton, Arthur James	Agri.	Soph.	Portland
Tinker, George Henry	Agri.	Voc.	Seattle, Wash.
Tolls, Leveritt Joseph	Agri.	Fr.	Portland
Tooker, Floyd Llewellyn	Com.	Fr.	Salem
Truesdell, Charles	Agri.	Soph.	Redlands, Calif.
Tubbesing, William Herman	M. E.	Soph.	Portland
Tulley, Stewart Wendell	Opt.		Walla
Turnbull, James Lockhart	Min.	Sr.	Mooreville
Turner, Margerite	Com.	Fr.	Corvallis
Tussing, Gerald Dean	M. A.	Voc.	Brownsville
Tuthill, Lewis Hamilton	Hi. E.	Fr.	Sutherlin
Tuttle, LeRoy James	For.	Sr.	Naches, Wash.
Tweed, Catherine	H. E.	Soph.	Okanogan, Wash.

Name	Course	Rank	Home Address
Tycer, Roy Adrian	I. A.	Fr.	Brownsville
Tyrrel, Claude Alonzo	Agri.	Soph.	Alhambra, Calif.
Tynell, Lyvere Allen	Agri.	Voc.	Castle Rock, Wash.
Underwood, Joseph Marion	Min.	Jr.	Pasadena, Calif.
Ure, Ray Elwin	Agri.	Voc.	Portland
Vail, Richard	Agri.	Fr.	Ferndale, Wash.
Van Atta, Ellis	E. E.	Soph.	North Yakima, Wash.
Van Buskirk, Elinor	H. E.	Soph.	Portland
Van Buskirk, Frances Eugene	H. E.	Fr.	Portland
Van Buskirk, Mac	Agri.	Sr.	Portland
Vannice, Keifer Thomas	Com.	Fr.	Corvallis
Van Norden, Loys Freeman	Agri.	Spec.	The Dalles
Van Orsdel, Thomas Clark	For.	Spec.	Dallas
Van Raes, Fred Adolph	Com.	Voc.	Fairbanks, Alaska
Varma, Sanjhi Ram	Agri.	Jr.	Batala, Punjale, India
Vaughan, Leonard	Agri.	Voc.	Lebanon
Vestal, James Fenix	I. A.	Soph.	Eagle Point
Vihari, Ambalal Jivabhai	Com.	Jr.	Baroda, India
Vilas, George Warren	Com.	Sr.	Medford
Vincent, Hazel Margaret	H. E.	Soph.	Viri, Okla.
Virgil, Fannie Eldora	H. E.	Sr.	Klamath Falls
Volbrecht, Marguerite	Com.	Fr.	Gresham
Voruz, Ruth	H. E.	Soph.	Baker
Wagner, Henrietta	H. E.	Jr.	Laurel, Ind.
Waite, Katherine Douglas	Phar.	Soph.	Roseburg
Wakeman, William James	For.	Sr.	Portland
Walborn, Clay Elwood	Agri.	Spec.	Portland
Walberg, Hilding Carl	Agri.	Jr.	Los Angeles, Calif.
Walen, Lulu	Com.	Fr.	North Yakima, Wash.
Walker, Edwin	Com.	Fr.	Dolores, Colo.
Walker, Ethel Elaine	H. E.	Soph.	Corvallis
Walker, Ozbun Garard	Com.	Fr.	Portland
Walker, Tom Martin	Agri.	Voc.	Fairbanks, Alaska
Walpole, Robert Nichols	Agri.	Fr.	Portland
Walters, Eugene Paul	M. E.	Voc.	Hillyard, Wash.
Walters, Mary Frances	Com.	Fr.	Corvallis
Walton, Fremont Winston	Agri.	Sr.	Salem
Ward, Lillian Alice	H. E.	Fr.	Portland
Ward, Sidney	Com.	Spec.	Goldendale, Wash.
Wascher, Frank	Agri.	Sr.	Portland
Washburne, James	Agri.	Spec.	Junction City
Watenpugh, Harold Leroy	Agri.	Soph.	Ontario, Calif.
Watenpugh, Roland Vernet	Com.	Soph.	Ontario, Calif.
Waterman, Crawford Burbank	Agri.	Fr.	Pasadena, Calif.
Waterman, Whitney	Agri.	Soph.	Pasadena, Calif.
Waters, Clarence	Agri.	Fr.	Idaho Falls, Idaho
Waters, Frank Northup	E. E.	Soph.	Portland
Watson, Irvin	Agri.	Jr.	Corvallis
Watt, Robert Henry	Agri.	Fr.	Bay City
Wattenburger, Ina Mae	H. E.	Sr.	Echo
Weber, Richard	Agri.	Soph.	The Dalles

Name	Course	Rank	Home Address
Webster, Earl.....	Agri.	Fr.	Portland
Webster, Robert Millard.....	Agri.	Fr.	Milford, Utah
Weeks, Margaret Lucy.....	Opt.		Portland
Wellman, Harrison Richard.....	M. E.	Fr.	Umapine
Werlein, Edward Eldridge.....	E. E.	Soph.	Portland
Werner, Richard John.....	Agri.	Sr.	Los Angeles, Calif.
Werth, Conrad Walter.....	E. E.	Jr.	Portland
Wescott, Merton Girard.....	Agri.	Spec.,	Winter Harbor, Maine
West, Flavius	Com.	Fr.	Portland
West, Thelma	M. E.	Fr.	Dee
Weymouth, Blanche Naomi.....	Com.	Fr.	San Francisco, Calif.
Wharton, Jane	H. E.	Spec.	Roseburg
Wharton, Malcom.....	Agri.	Soph.	Garden Grove, Calif.
Wheeler, Eva May.....	H. E.	Fr.	Tillamook
Wheeler, Harold Edward.....	Com.	Jr.	Portland
Wheeler, Helen Grace.....	H. E.	Fr.	Portland
Wheeler, Levi Asher.....	For.	Fr.	Strathmore, Calif.
Whillock, Bertha Alice.....	Com.	Spec.	Medford
Whitaker, Elizabeth.....	Com.	Fr.	McFarland, Calif.
Whitaker, Leslie Clinton.....	Agri.	Soph.	Sacramento, Calif.
Whitaker, Raymond Wallace.....	Agri.	Soph.	McFarland, Calif.
White, Cleo Oneeta.....	H. E.	Sr.	McMinnville
White, Florence Geraldine.....	H. E.	Fr.	Oregon City
White, Harold	Com.	Fr.	Kerby
White, Irle Eaton.....	Agri.	Fr.	Polson, Mont.
Whitmore, Corrine Marion.....	H. E.	Voc.	Jermyn, Pa.
Wicks, Arthur Forest.....	Agri.	Fr.	North Powder
Wicks, Forrest	M. E.	Sr.	Albany
Wieder, David Martin.....	Com.	Fr.	Albany
Wieman, John Samuel.....	Agri.	Soph.	Los Angeles, Calif.
Wiggins, Jeanette Margaret.....	Com.	Fr.	Portland
Wilber, Howard Earl.....	Agri.	Fr.	Long Beach, Calif.
Wilbur, Robert Fisher.....	Agri.	Fr.	Omaha, Nebr.
Wilcox, Joseph Hillair.....	Agri.	Fr.	Pendleton
Wilcox, Ralph.....	Com.	Sr.	Portland
Wilde, Cora Anna Mary.....	Com.	Voc.	Junction City
Wilhelm, Roger Jesse.....	Min.	Fr.	The Dalles
Wilkes, Clair	Agri.	Sr.	Hillsboro
Wilkes, Elinor	Opt.		Hillsboro
Wilkes, Rhea	H. E.	Sr.	Hillsboro
Wilks, Lovel Raymond.....	Agri.	Fr.	Helix
Willer, Ernest Koch.....	Agri.	Spec.	Detmold, Germany
Willey, Earl Clark.....	M. E.	Spec.	Coquille
Williamson, Loma Emma.....	H. E.	Fr.	Corvallis
Williamson, Martha Jane.....	H. E.	Soph.	Corvallis
Willis, Elwin Clinton.....	Com.	Fr.	Corvallis
Willoughby, Charles Elbert.....	Com.	Soph.	National City, Calif.
Willoughby, Ralph.....	Agri.	Fr.	Harrisburg
Wilmot, Richard Kenneth.....	For.	Jr.	Portland
Wilt, Clarence Oliver.....	M. A.	Voc.	Corvallis
Williams, Carl Alfred.....	Com.	Fr.	Alpine

Name	Course	Rank	Home Address
Williams, Charles Walter.....	Agri.	Jr.	Corvallis
Williams, Claire Stamwood.....	Agri.	Voc.	Philomath
Williams, James Wayne.....	L. E.	Fr.	Portland
Williams, Llewellyn Morris.....	Com.	Soph.	Corvallis
Williams, Mary Edna.....	Opt.	.....	Corvallis
Williams, Richard.....	Agri.	Jr.	Hillsboro
Williams, Richard Hipsley.....	Agri.	Soph.	Dillon, Mont.
Williams, Ruth	Opt.	.....	Glendale
Williams, Sumner	L. E.	Fr.	Glendale
Williams, Vern Whitman.....	Phar.	Spec.	Airlie
Williams, William.....	E. E.	Sr.	Portland
Wilson, Bushrod Washington.....	Min.	Spec.	Corvallis
Wilson, Jalmar	M. E.	Jr.	Astoria
Wilson, John Bushrod.....	Agri.	Sr.	Corvallis
Wilson, Olive Isabelle.....	H. E.	Sr.	Bonneville
Wilson, Otis Estee.....	M. E.	Soph.	Salem
Wilson, Russell Charles.....	Agri.	Voc.	Troutdale
Wilson, Stella Nora.....	H. E.	Soph.	Burns
Winsor, Charles	Com.	Soph.	North Bend
Winter, Ardina.....	Agri.	Soph.	Los Angeles, Calif.
Wise, Clarence Jerome.....	Com.	Jr.	Alpine
Witt, Eric William.....	Agri.	Fr.	Portland
Wood, Edwin Roscoe.....	Agri.	Fr.	Exeter, Calif.
Wood, Rowena Adelaide.....	Opt.	.....	Arlington
Woodcock, Arthur James.....	Phar.	Jr.	Portland
Woodsum, Edna May.....	H. E.	Soph.	Corvallis
Woodworth, Gladys	H. E.	Spec.	Portland
Woodworth, Grace	H. E.	Sr.	Portland
Woollomes, James Paul.....	Com.	Soph.	Delano, Calif.
Woollomes, Agnes Mara.....	H. E.	Fr.	Delano, Calif.
Wooton, Pearl Alice.....	H. E.	Fr.	Portland
Wootton, William Barker.....	Opt.	.....	Astoria
Worley, Stanley	Agri.	Jr.	San Francisco, Calif.
Wright, Blanche Ellen.....	H. E.	Fr.	Brownsville
Wright, Dorothy Lois.....	H. E.	Sr.	Portland
Wright, Mark	For.	Sr.	Tumalo
Wright, Marshall Simpson.....	Agri.	Soph. ..	Sierra Madre, Calif.
Wright, Minnie Ethel.....	H. E.	Sr.	La Grande
Wright, William So Relle.....	Agri.	Jr.	San Gabriel, Calif.
Yanamoto, Francis Yoneichi.....	E. E.	Jr.	Seattle, Wash.
Yannke, Genevieve Louise.....	H. E.	Fr.	Salem
Yates, Eva	H. E.	Jr.	Corvallis
Yates, Lloyd Dexter.....	For.	Sr.	Milton
Yeatman, Irene Estelle.....	H. E.	Fr.	Oakland, Calif.
Young, Ellsworth Schuyler.....	For.	Soph.	Mt. Solo, Wash.
Young, Ruth Evelyn.....	H. E.	Spec.	Salem
Young, Vida	H. E.	Sr.	Stayton
Young, Walter Henry.....	Agri.	Fr.	La Grande
Zan, Regina	H. E.	Voc.	Portland
Ziegler, Helen Marie.....	H. E.	Soph.	White Salmon, Wash.
Ziegler, Laura Elizabeth.....	H. E.	Soph.	White Salmon, Wash.
Zimmerman, Wilson Stuart.....	Hi. E.	Spec.	Portland

SUMMER SCHOOL STUDENTS

(Course classification in the Summer School roll is necessarily arbitrary. Few students register in a single group of subjects. Where the major is easily determined it is indicated as Art, Commerce (Com.), Home Economics (H. E.), Methods in Teaching (Meth.), Music. College (Coll.) indicates those who took college courses included in two or more of the foregoing or in other subjects. Special (Spec.) indicates Short Course for Industrial Club Members.)

Name	Course	Home Address
Acheson, Gertrude	Meth.	Portland
Acheson, Edna	Meth.	Portland
Acree, Louise Carlton	Coll.	Berkeley, Calif.
Ahern, Merrie Ierne	Coll.	Hugo
Allen, Walter	Spec.	Darby
Allingham, William David	Meth.	Corvallis
Amort, Paul	Meth.	Corvallis
Anderson, William	Coll.	Portland
Appleman, Marguerite	Coll.	Corvallis
Archbold, Alton Conway	Meth.	Corvallis
Armitstead, Amy	Meth.	Portland
Asbahr, Katherine	Meth.	Cornelius
Ault, Byrd	Meth.	Enterprise
Ayres, Richard	Spec.	Corvallis
Baker, Albert	Com.	Port Angeles, Wash.
Baldwin, Ayne	Coll.	Philomath
Ball, Waldo	Coll.	Corvallis
Barden, Margurite	Meth.	Missoula, Mont.
Barfoot, Gladys	Coll.	Corvallis
Barfoot, May	Coll.	Corvallis
Barratt, Marjorie	Coll.	Portland
Barss, A. F.	Coll.	Corvallis
Bartlett, Ethelyn	H. E.	Grants Pass
Barton, Robert	Meth.	Portland
Barzee, Fay	Meth.	Corvallis
Beard, Mrs. R. F.	Coll.	Corvallis
Bechen, Martha	Meth.	Hillsboro
Bedynik, John	Mus.	Corvallis
Benson, Mrs. O.	Meth.	Cottage Grove
Bernstein, Salome	Meth.	Portland
Biesen, Valeska	Coll.	Portland
Billie, Brewer	Meth.	Astoria
Birch, Gracia Delle	Meth.	Corvallis
Blackman, Mrs. R.	Coll.	Portland
Blakely, Lloyd	Meth.	Corvallis
Blume, Muriel	Spec.	Albany
Boies, Etta	Meth.	Corvallis
Bonney, Margaret	Spec.	The Dalles
Bonney, Rex	Spec.	The Dalles
Bowen, Merle	Meth.	Silverton
Bowles, Lindlay	Spec.	Dallas
Brennan, Minnie	Meth.	Berkeley, Calif.
Brewer, Grace	Meth.	Portland
Brodie, R. K.	Coll.	Corvallis

Name	Course	Home Address
Brogden, Cecil	Coll.	Hillsboro
Brogden, J. L.	Coll.	Hillsboro
Brown, Gertrude	Spec.	Tygh Valley
Bruce, Louise Charlotte	Mus.	Portland
Buchanan, Frank G.	Meth.	Oregon City
Buchanan, Walter	Meth.	Florence
Brumbaugh, Madeline	Spec.	Corvallis
Brumbaugh, Sheldon	Spec.	Corvallis
Bursell, Hazel	Spec.	Monmouth
Bursell, Homer	Spec.	Monmouth
Burtner, Kathryn	Spec.	The Dalles
Butler, Mrs. Maude	Coll.	Cathlamet, Wash.
Campbell, Cora	Meth.	Roseburg
Campbell, Donald	Meth.	Portland
Cantrall, Leland	Meth.	Ruch
Cartan, Hazel	Meth.	Corvallis
Castle, Carrie	Coll.	Berkeley, Calif.
Case, Vanessa	Coll.	Corvallis
Chalker, Estella	Coll.	Portland
Charley, Claus	Spec.	Brownsboro
Charley, Leland	Spec.	Brownsboro
Choller, Maude	Meth.	Portland
Churchill, Leigh	Com.	Corvallis
Churchman, Tressa	Coll.	Corvallis
Clancy, Bess	Meth.	Woodland, Wash.
Clarke, Doris	Meth.	Portland
Clarke, Edna	Meth.	Portland
Cochrane, Adona	Coll.	Corvallis
Collins, Joseph	Spec.	Central Point
Conklin, Evelyn	Meth.	Grants Pass
Cooley, Earl	Spec.	Salem
Cordery, Lucille	H. E.	Pendleton
Cordley, Dorothea	Coll.	Corvallis
Courtney, Gertrude	Spec.	La Grande
Crosby, Mabel	Spec.	Hillsboro
Currin, Minnie Edith	Meth.	Corvallis
Currin, Mary	Coll.	Heppner
Dallinger, Bertha	Meth.	Portland
Darling, Ruth	Mus.	Corvallis
Davidson, Della	H. E.	San Raphael, Calif.
Davis, Anita	Meth.	Portland
Davis, Keren Lee	Meth.	Portland
Davis, Leonard	Com.	Corvallis
Davis, Norma	Coll.	Corvallis
Davison, Janet	Meth.	Cottage Grove
Dearmin, Lillian	Com.	Portland
Demmon, Alice	H. E.	Butte, Mont.
Denniston, Laneta	Meth.	McMinnville
Dillon, Martha	Coll.	Portland
Doane, Emery	Coll.	Salem
Doolittle, Maida Laura	Meth.	Wallowa

SUMMER SCHOOL STUDENTS

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Name	Course	Home Address
Down, J. R.	Meth.	Joseph
Duncan, R. A.	Meth.	Corvallis
Dunne, Lucille	Meth.	Portland
Durrell, Jean	Coll.	Corvallis
Edwards, Bertha Beulah	Meth.	Monroe
Edwards, Caryl	Com.	Corvallis
Eliot, Calista Post	Coll.	Portland
Eliot, Craig	Spec.	Portland
Eliot, Mignon	Spec.	Portland
English, E. C.	Coll.	Nehalem
English, Georgia	Coll.	Nehalem
Evans, Ora	Spec.	Mosier
Fawcett, Hazel	Meth.	Coquille
Fick, Frank	Meth.	East Auburn
Fielder, Elizabeth	Coll.	Corvallis
Finnerty, Mrs. G. E.	H. E.	Albany
Finnerty, G. E.	Coll.	Albany
Fitts, Grace	Meth.	Corvallis
Fones, Theodore Claude	Spec.	Yamhill
Fowler, Newell	Meth.	Anacortes, Wash.
Fox, Otto	Meth.	Ashland
Frazier, Genevieve	Com.	Salem
Frost, Melville	Spec.	Corvallis
Fridley, Nettie	Meth.	Klondike
Fulton, Helen	Coll.	Corvallis
Funk, Arnold	Com.	Corvallis
Gale, William	Coll.	Keating
Gambee, Hosmer	Meth.	Phoenix, Arizona
Gambee, Lewis Phaon	Meth.	Corvallis
Garvin, Goldia	Coll.	Corvallis
Gatchell, Charles Barnard	Meth.	Corvallis
Gerow, Mrs. A. C.	Meth.	Portland
Glines, Hallie	Meth.	Walport
Goble, Ray	Meth.	Ferndale, Calif.
Goemanpott, Etta	Coll.	Renville, Minn.
Graves, L. L.	Coll.	Corvallis
Grimes, Etta	Meth.	Corvallis
Groshong, F. M.	Meth.	Portland
Guthrie, Jane	Meth.	Corvallis
Guthrie, Mary	H. E.	Oak Grove
Guthrie, G. W.	Meth.	Oak Grove
Haight, Racheal	P. E.	Corvallis
Hall, Mable	Meth.	Medford
Halsey, Caroline	Meth.	Burlington, Wash.
Hamilton, J. M.	Meth.	National City, Calif.
Hamman, Elizabeth Snell	Meth.	Echo
Hamman, E. W.	Meth.	Echo
Hansen, Kareen	Meth.	Corvallis
Hanson, Manette	Meth.	Corvallis
Hanson, Margaret	Meth.	Corvallis
Hanthorn, Faith	Meth.	Portland

Name	Course	Home Address
Harriman, Arthur	Com.	The Dalles
Harriman, Edna	Com.	The Dalles
Harriman, Nellie	Com.	The Dalles
Hart, Anna	Coll.	Portland
Hartzog, Clara	Coll.	Lakeview
Hartzog, Delphia	H. E.	Lakeview
Hathaway, Mark	Coll.	Corvallis
Haumeser, Elsie	Coll.	Portland
Hawkins, Leroy	Spec.	Mill City
Heath, Laura	Meth.	Corvallis
Heckart, E. W.	Meth.	Eugene
Heckart, Mrs. Viva	H. E.	Springfield
Hilliar, Agatha Amelia	Meth.	London, England
Holgate, Laura	Coll.	Corvallis
Hollingsworth, Gertrude	Meth.	Newberg
Howard, W. C.	Meth.	Stanfield
Howett, Elizabeth	Meth.	Gresham
Humphrey, Esther	Coll.	Eugene
Hung, Tung Ming	Com.	Amoy, China
Hunt, Irene	Spec.	The Dalles
Hurd, Mildred	Com.	Corvallis
Husbands, Esther	Coll.	Hood River
Irvine, Harry	Coll.	Silverton
Irving, Iona	Meth.	Albany
Jaeger, Paul	Spec.	Sherwood
Jackson, Laura	Coll.	Lorane
James, Oscar	Meth.	Corvallis
Janes, Marjorie	Meth.	Portland
John, Morris	Meth.	Corvallis
Johns, Miles	Meth.	Seattle, Wash.
Johnston, Jane Agnes	Meth.	Corvallis
Johnston, Ida May	Meth.	Portland
Jones, Carmen	Spec.	Pendleton
Jones, Marie	Meth.	Corvallis
Kalbus, Minnie	Meth.	Chehalis, Wash.
Kan, Grace	Coll.	McMinnville
Kehrli, Hulda Margaret	Meth.	Hillsdale
Kelley, Glenn	Meth.	Portland
Kelly, Ruth	Coll.	Portland
Kern, Alma	Com.	Washougal, Wash.
Ketchum, Beth	Meth.	Independence
Keyes, Mrs. H. F.	Coll.	Corvallis
Kimmel, Walter	Meth.	Lebanon
King, Luther	Meth.	Corvallis
Kirkham, Mrs. J. M.	Meth.	Ritzville, Wash.
Kirkham, J. M.	Meth.	Ritzville, Wash.
Kirkham, V. R. D.	Meth.	Ritzville, Wash.
Knopp, Grace	H. E.	Eugene
Kongsle, Edward	Meth.	Bellingham, Wash.
Lafky, E. H.	Meth.	Corvallis
Laidlaw, Charlotte	H. E.	Portland

SUMMER SCHOOL STUDENTS

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Name	Course	Home Address
Lane, Dorothy	Coll.	Los Angeles, Calif.
Lee, George	Meth.	Maltby, Wash.
Leeper, Enid Glenda	Meth.	Corvallis
Leland, Randolph	Meth.	Los Angeles, Calif.
Lewis, Claudia	Mus.	Corvallis
Lewis, Mae	Meth.	Albany
Lindsay, Edith	Coll.	Corvallis
Littler, Florence	Meth.	Forest Grove
Loo, Nai Fatt	Coll.	Victoria, B. C.
Lowe, Marian	Spec.	Nyssa
Loy, Alfred	Spec.	Buena Vista
Lukens, G. W.	Meth.	Redwood Falls, Minn.
McBride, Mildred	Meth.	Corvallis
McDonald, May	Spec.	Dallas
McCallum, D. P.	Meth.	Vancouver, B. C.
McCammant, Davis	Coll.	Portland
McCormack, Mrs. Joel	Meth.	Corvallis
McCornack, Alice	Meth.	Marcola
McDonald, Byron	Meth.	The Dalles
McFarlane, Mrs. Mary	Meth.	Corvallis
McHenry, Muriel	Meth.	Corvallis
McKay, James Douglas	Meth.	Portland
McRay, Lela	Coll.	Corvallis
MacDonald, Helen	Meth.	Corvallis
MacGowan, Warren	Spec.	Independence
Maris, Homer	Coll.	Portland
Martin, Elsie	Coll.	McMinnville
Martin, Emily	Coll.	Corvallis
Meacham, Leta	Coll.	Weiser, Idaho
Meneice, Sarah	Meth.	Home Valley, Wash.
Mercer, Helen	Meth.	Salem
Mettie, Zena	Meth.	Ukiah
Metzler, Ethel	Meth.	Corvallis
Miller, D. B.	Coll.	Corvallis
Miller, Esther	Spec.	Medford
Miller, Mrs. E. R.	Meth.	Portland
Miller, Eva	Meth.	Corvallis
Miller, Helen	Meth.	Corvallis
Miller, James	Meth.	Centralia, Wash.
Montgomery, Pearl	H. E.	Portland
Moore, Genevieve	Coll.	Corvallis
Morgan, Exie	Spec.	The Dalles
Morgenson, Louise	Spec.	Tygh Valley
Morris, Blanche	Meth.	Tennant, Iowa
Morris, Gwendolyn	Spec.	Corvallis
Morris, Mrs. H. W.	Meth.	Corvallis
Morton, Ruth	Coll.	Hood River
Motley, J. W.	Meth.	Heppner
Mudge, Frank	Coll.	Nappa
Muir, A. B.	Meth.	Portland
Mullenhoff, Rudolf	Spec.	Boring

Name	Course	Home Address
Munford, Ruby	Meth.	Senecaville, Ohio
Munson, Robert	Meth.	Oakland, Calif.
Murphy, Pat	Coll.	Butte, Mont.
Myers, Eva T.	Coll.	Long Creek, Ill.
Nichols, Ben	Com.	Glendale, Calif.
Nichols, Tressa	Meth.	Corvallis
North, David	Meth.	Corvallis
Norton, Mabel	Meth.	Corvallis
Norton, W. B.	Meth.	Corvallis
Olin, John Frederick	Spec.	Mill City
Orr, Vernon	Spec.	Rogue River
Osborn, William	Meth.	Portland
Page, Ina	Spec.	Shaniko
Farcher, Phillip	Meth.	The Dalles
Parker, Stella	Coll.	Mosier
Passmore, Dorothy	Meth.	Tualatin
Patterson, Margaret	Meth.	Ashland
Patton, Palmer	Coll.	Davis
Peachey, Robert	Meth.	Jacksonville
Pearcy, Raymond	Spec.	The Dalles
Peavy, Bradley	Coll.	Corvallis
Peterson, Henry	Spec.	Junction City
Peterson, Inez	Coll.	Corvallis
Peterson, S. H.	Meth.	Corvallis
Ifaff, R. L.	Coll.	Salem
Philippi, Leora	Meth.	Early
Pimm, Alice	Meth.	Philomath
Pine, W. D.	Coll.	Berkeley, Calif.
Plank, Esther	Meth.	Woodburn
Post, Clara	Meth.	Blachly
Post, E. O.	Meth.	Blachly
Potter, Willis	Spec.	Mill City
Powell, R. H.	Coll.	Medford
Prentiss, Mrs. Sara Watts	Meth.	Portland
Quint, Alice	Coll.	Broadmead
Rains, Opal	Coll.	Oregon City
Ramsdell, George	Coll.	Portland
Rankin, Grace	H. E.	Portland
Ream, Rebecca	Coll.	Metzger
Reed, David	Meth.	Tillamook
Reeves, Orville	Meth.	Corvallis
Reichart, Robert	Meth.	Corvallis
Reynolds, Harold	Spec.	Independence
Rice, Gladys	Meth.	Corvallis
Roberts, Jessamy	Meth.	Portland
Robey, Gladys	Meth.	Corvallis
Rossiter, Cora	Meth.	Manly, Iowa
Ruring, G. A.	Meth.	Vale
Russell, Ann	Meth.	Portland
Ruth, Mrs. C. C.	Coll.	Corvallis
Rutledge, Anne	Meth.	Spokane, Wash.

SUMMER SCHOOL STUDENTS

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Name	Course	Home Address
Sahasrabudhe, J. V.	Meth.	Nagpur, India
Sanders, George	Meth.	Tillamook
Sawyer, Doris	Coll.	Salem
Schelling, Caroline	Coll.	Cottage Grove
Schreiber, Martin	Meth.	McMinnville
Schrepel, Minnie	Meth.	Corvallis
Schultz, Elsie	Meth.	Gresham
Seeley, Hazel	Mus.	Independence
Sevy, Genevieve	Coll.	Freewater
Seavy, J. B.	Meth.	Freewater
Seavy, Mrs. Orpha	Meth.	Freewater
Sexton, Dana	Coll.	Hugo
Shaw, R. F.	Coll.	Portland
Sheridan, Rose Mae	Meth.	Shedds
Shimmin, Albert	Meth.	Anacortes, Wash.
Shimmin, Everett	Meth.	Anacortes, Wash.
Skidmore, Maud	Coll.	Curtin
Smith, Eleanor	Mus.	Corvallis
Smith, Esther	Meth.	Amity
Smith, Mrs. E. M.	Coll.	Corvallis
Smith, H. B.	Com.	Los Angeles, Calif.
Smith, Wallace	Coll.	Corvallis
Soden, Frances	Coll.	Portland
Soden, Mildred	Meth.	Portland
Sodhi, Charn Singh	Meth.	Guetta, India
Stearns, Mrs. H.	Coll.	Walla Walla, Wash.
Stearns, Martin	Coll.	Walla Walla, Wash.
Strange, Lola May	Mus.	Corvallis
Stewart, Earl	Spec.	Cottage Grove
Straughan, J. A.	Meth.	Pendleton
Struble, F. H.	Meth.	Corvallis
Struck, Martha	Coll.	Lyle, Wash.
Stuart, Isabella	H. E.	Oakland, Calif.
Sumner, Madge	Spec.	Antelope
Sykes, Nell	Meth.	Salem
Thayer, Mrs. D. G.	Meth.	Corvallis
Thomas, George Randolph	Meth.	Forest Grove
Thomas, Mrs. George Randolph	Meth.	Forest Grove
Thomas, Mrs. Lucy	H. E.	Portland
Thompson, Benjamin	Coll.	Corvallis
Thompson, Mrs. Ella	Coll.	Corvallis
Thompson, Mrs. Mary	Meth.	Marshfield
Tillery, Genevieve	Meth.	Corvallis
Tilton, Arthur	Coll.	Portland
Tobey, Otis Charles	Spec.	Dufur
True, Mrs. Elsie	Meth.	Sherwood
Turner, Arthur Edward	Meth.	Corvallis
Turner, H. W.	Meth.	Eugene
Tweed, Catherine	Meth.	Corvallis
Underwood, E. F.	Meth.	Corvallis
Van Buskirk, Ronald	Spec.	Portland

Name	Course	Home Address
Van Loo, Elizabeth	Coll.	Portland
Vierhus, Ellen	Meth.	Oregon City
Vilas, George	Coll.	Medford
Virgil, Fannie	Meth.	Klamath Falls
Waddell, Norma	Meth.	Corvallis
Walker, Ethel	Coll.	Corvallis
Wattenburger, Ina	Meth.	Echo
Wells, Mrs. C. B.	H. E.	Portland
Wharton, Florence	Spec.	Roseburg
Wheeler, A. W.	Meth.	Corvallis
Whipple, Gladys	Meth.	Portland
Wilkes, Lena	Spec.	Hillsboro
Williamson, Charles	Meth.	Corvallis
Witzig, Ivy	H. E.	Corvallis
Wolcott, Lena	Coll.	Corvallis
Wright, Dorothy	Coll.	Portland

SPECIAL MUSIC STUDENTS *

Name	Course	Home Address
Appleman, Marguerite	Voice	Corvallis
Arthurs, Arleigh	Violin	Brownsville
Bauer, Marian	Piano	Corvallis
Bedynik, John	Violin	Corvallis
Blackstone, Paul	Voice	Corvallis
Bradshaw, Harrison	Piano	Newport
Broders, Chester	Piano	Corvallis
Brumbaugh, Madeline	Violin	Corvallis
Burton, Mabel Stevens	Voice	Corvallis
Chambers, Bernice	Piano	Corvallis
Cordley, Dorothea	Voice	Corvallis
Corrie, Bernice	Piano	Corvallis
Eaton, Helen	Piano	Independence
Ficher, Ardis	Piano	Corvallis
Fisher, Mrs. W. G.	Voice	Philomath
Foster, Ada	Piano	Corvallis
Fox, Otto	Trombone	Albany
Garrett, Arline	Piano	Corvallis
Harpole, Mrs. Irene	Piano	Monroe
Hatch, Leonard	Clarinet	Corvallis
Hurd, Blanche	Violin	Corvallis
Kerr, Marion	Violin	Corvallis
Kiger, Martha	Voice	Corvallis
Kirk, Christine	Piano	Corvallis
Kuhlman, Mrs.	Voice	Corvallis
McBride, Clare	Violin	Corvallis
McLouth, Mrs.	Piano	Corvallis
Martin, Ruby Marie	Piano	Newberg

* In addition to the names listed here, 200 regular students of the College whose names are listed elsewhere in the catalogue took work in the School of Music.

WINTER SHORT COURSE STUDENTS

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Name	Course	Home Address
Merriott, Mona Rosalie	Piano	Corvallis
Moore, Elsie Virginia	Voice	Seattle, Wash.
Nichols, Mrs. Eleanor	Voice	Corvallis
Peer, Helen	Mandolin	Corvallis
Schubert, John Walter	Violin	Corvallis
Shattuck, Mrs. Obil	Saxophone	Corvallis
Skipton, Lawrence	Violin	Corvallis
Smedley, Georgian	Piano	Portland
Smith, Eleanor	Voice	Corvallis
Spencer, Clyde	Harmony	Portland
Stenson, Raymond	Clarinet	Corvallis
Thomas, P. F.	Violin	Corvallis
Watkins, Mrs. A. W.	Piano	Philomath
Watson, Fannie	Violin	Corvallis
Watson, Margaret	Piano	Corvallis

WINTER SHORT COURSE STUDENTS

Name	Home Address	Name	Home Address
Adams, Mrs. Alice.....	Corvallis	Cramer, Theodore.....	Grants Pass
Adamson, James.....	Prineville	Curry, Mrs. Josephine....	Corvallis
Alexander, Wilton Eugene.	Sheridan	Darnall, H. A.....	Lents
Amos, William.....	Culver	Davenport, Jesse A.....	Roseburg
Anderson, Arthur.....	Aurora	Decker, T. A.....	Hood River
Anderson, Ben.....	Heppner	Deffenbaugh, George.....	Corvallis
Anderson, Carl.....	Lee	Eames, Mrs. Alvah.	Cordova, Alaska
Anderson, David.....	Tangent	Earnest, Lillian.....	Corvallis
Anderson, George.....	Sherwood	Edholm, F. O.....	Albany
Anderson, Henry.....	Mt. Angel	Edholm, Roy	Albany
Anderson, T. J.....	Aurora	Edwards, J. W.....	Drain
Arnold, Mrs. Marie.....	Albany	Egger, John.....	Portland
Atwood, J. R.....	Corvallis	Erickson, H. J.....	Barlow
Axtell, Mrs. Elizabeth.....	Corvallis	Ewing, Frank.....	Estacada
Bartholomew, Mrs. Mae...	Corvallis	Ewing, Mrs. Frank.....	Estacada
Belloni, H. P.....	Coquille	Faber, Minnie	Albany
Bergstrom, Ellen.....	Gooseberry	Farmer, Ora	Shedd
Bergstrom, Emma.....	Eight Mile	Fegley, Mrs. A.....	Corvallis
Bergstrom, Hannah.....	Eight Mile	Flegel, Blair	Eugene
Berning, Clement.....	Mt. Angel	Flint, Joseph	Beaverton
Blevins, Glenn Maxey.....	Tangent	Forbes, Mrs. May.....	Corvallis
Bossen, Henry.....	Langlois	Forest, George.....	Three Pines
Braun, G. H.....	Dallas	Frazer, Clay.....	Albany
Breyman, Mrs. A. C.....	Portland	Gay, Bonnie Linn.....	Corvallis
Browne, Robert Henry.....	Medford	Gay, Nettie	Corvallis
Browne, Mrs. Robt. Henry.	Medford	Gay, Mrs. W. F.....	Corvallis
Brumbaugh, Mrs. J. F.....	Corvallis	Gilkey, Mrs. Mildred.....	Portland
Buddenhagen, Clarence....	Portland	Golden, Mrs. C. E.....	La Grande
Burkhart, Mrs. George.....	Grnte	Grant, Dayton Ephraim....	Culver
Burnap, W. S.....	Corvallis	Gray, Lloyd.....	Dufur
Byers, Mabel.....	Moro	Haffey, George.....	Portland
Caldwell, Mrs. V. A.....	Corvallis	Herd, William.....	Yamhill
Cannon, Mrs. Roy.....	Corvallis	Herigstad, Carl.....	Silverton
Chase, Ernest.....	Corvallis	Hilton, Everett.....	Portland
Clarke, Wedworth.....	Parkdale	Hinds, H. J.....	Corvallis
Cochran, E. A.....	Cloverdale	Hoecker, Conrad.....	Corvallis
Cochrane, Mrs. Isabelle....	Corvallis	Hopkins, S.....	Corvallis
Compton, C. B.....	Dee	Howard, Edna.....	Philomath
Coon, G. B.....	Corvallis	Howard, Mrs. Etta.....	Corvallis
Cooper, Ray.....	Hebo	Howard, H. B.....	Philomath
Cornell, Ivan Robb.....	Portland	Howard, John	Corvallis

Name	Home Address	Name	Home Address
Jackson, Edgar.....	Portland	Radford, F. W.....	Hood River
Jackson, Thomas.....	Lorane	Randleman, Claude.....	Bandon
Jaeger, Henry.....	Sherwood	Richey, G. H.....	Corvallis
Jarvis, Lloyd.....	Myrtle Point	Robbins, G. W.....	Corvallis
King, Clara.....	Helix	Robbins, Mrs. Mary H.....	Corvallis
King, J. E. E.....	Helix	Roberts, Allyn.....	Boyd
Knecht, Fred.....	Portland	Rowland, J. S.....	Rickreall
Kruse, Elmer.....	Sherwood	Rudat, Fred.....	Clifton
Lange, Fred.....	Scappoose	Rufener, Fred.....	Corvallis
Lelliott, John Leonard.....	Mosier	Rulschman, Albert.....	Tangent
Livingstone, H.....	Wenatchee, Wash.	Sanders, L. M.....	Corvallis
Lowell, Grace.....	Corvallis	Saunders, G. H.....	Portland
McAllister, R. G.....	Corvallis	Scadding, Mrs. Charles.....	Portland
McBride, F. Reed.....	Portland	Schmidt, Hans.....	Eugene
McCornack, Joel.....	Marcola	Schmidt, Martha.....	Eugene
McDevitt, Ray.....	Sumpter	Schnider, Ernest.....	Mt. Angel
McDonald, George.....	Norway	Schnider, Lawrence.....	Mt. Angel
McDonald, L. A.....	Corvallis	Shake, Mrs. Harold.....	Corvallis
Maas, Henry.....	Tangent	Sherman, Edwin.....	Corvallis
MacDonald, Mrs. L. A.....	Corvallis	Sinke, Carrie M.....	Perintosh, Alberta
Maegly, Esther.....	Portland	Somers, Eugenia.....	Corvallis
Magness, M. R.....	Myrtle Point	Spindler, Burton.....	Portland
Marsh, A. H.....	Looking Glass	Stearns, Harry.....	Lawen
Martin, F.....	White Salmon, Wash.	Stephens, John.....	Dilley
May, Mrs. Inez.....	Gervais	Stevenson, Mrs. Ola.....	Corvallis
Mayse, Lister.....	Dora	Stowell, Mrs. G. E.....	Corvallis
Merryman, J. H.....	Corvallis	Swango, S. F.....	Coburg
Meyers, Claud.....	Echo	Tammen, Rose.....	Albany
Myers, George H.....	Corvallis	Thompson, Ella.....	Corvallis
Miller, Cecil Olive.....	Portland	Thomsen, Clara Marie.....	Hood River
Miller, Mrs. J. F.....	Hood River	Tolladan, Mrs. Lucy.....	Corvallis
Naderman, Theodore H.....	Turner	Tolman, Elizabeth.....	Hood River
Needham, A. Roy.....	Cochise, Ariz.	Van Uyk, Charles.....	Santa Ana, Calif.
Overton, Joe.....	Pendleton	Vickers, Mrs. H. A.....	Corvallis
Parsons, Arthur.....	Crabtree	Walden, E. E.....	Central Point
Patchin, Edmund.....	Salem	Walker, Mrs. Effie.....	Corvallis
Patton, Hamilton.....	Medford	Waterman, Clyde.....	Myrtle Point
Peffer, Rex.....	Dayton	Watson, J. C.....	Corvallis
Peterson, T. E.....	Ione	Watson, Mrs. J. C.....	Corvallis
Phelps, Charles.....	Elmira	Weir, A. D.....	Corvallis
Phillips, Mrs. W. J.....	Corvallis	Williams, Robert F.....	Cove
Pipal, Mrs. Julia.....	Corvallis	Woodward, Rt. C.....	Victoria, Canada
Plank, Mrs. John.....	Salem	Worthington, Elbert.....	Lorane
Plank, John N.....	Salem	York, F. M.....	Carlton
Plog, Edna Louise.....	Hood River	Young, Paul.....	Eugene
Plog, Olga Agnes.....	Hood River	Youngby, Oscar.....	Carlton
Porter, Mrs. Flora.....	Corvallis	Zahler, John.....	Silverton
Pounder, Cecil James.....	Corbett	Zentner, Mrs. O. L.....	Eugene
Rabinsky, Fred.....	Scappoose	Ziefle, Mrs. Cresence.....	Corvallis
Rackleff, Lawrence.....	Coquille	Zumwalt, C. P.....	Port Orford

NOTE.—In addition to the above listed names, out of a total of 1723 students registered in the Farmers' Week and in the special Home Economics courses, the names of 1428 students who were registered in these courses but in no other College courses, do not appear.

SENIOR HONOR STUDENTS

Senior honors are conferred by the College Council upon those members of the graduating class who have maintained throughout their entire college course the highest scholastic standing in their department. No student is eligible to this honor unless his general average for all subjects has been eighty-five percent or higher. Election is limited to ten percent of the graduating members of a department.

SELECTION FOR JUNE 1916

AGRICULTURE

Joseph Edmond Currey
DeVere Fendall
Wallace LaDue Kadderly
Harvey Lee Lantz
Dale Everette Richards
Charles Hammer Roseman
Carey Lloyd Strome
Harold Roy Taylor
Earl Horsted Thompson
Nao Uyei

COMMERCE

Arnold John Funk

ENGINEERING

Winfield Eckley
Jack Walker Nash
Frank Vernon Romig
Rolf Theodore Wetteland

FORESTRY AND LOGGING EN-
GINEERING

Harold Gilbert Archibald

HOME ECONOMICS

Gertrude Acheson
Merrie Ierne Ahren
Una Marguerite Barden
Dorothy Southwick Brownell
Frances Helen Corl
Minnie Kalbus
Wilmetta Emily Morse
Winnifred Turner

MINES

Fritz Carl Floss

PHARMACY

Albert Dickenson Foster

FORENSIC HONOR ROLL FOR 1915-16

INTERCOLLEGIATE ORATOR

Eric Englund

INTERCOLLEGIATE DEBATERS

Robert Reichart
Godfrey Hoerner
Eric Englund

Phillip Parrish
Harold Hansen

CHAMPION INTERCLASS ORATOR

Eric Englund

Sophomore

CHAMPIONS IN INTERCLASS DEBATE

Bernard Mainwaring
Gerald Barrett
John Thayer

Freshmen

WINNER OF SHAKOPEAN CUP

Godfrey Richard Hoerner

Awarded annually to the member of the senior class
having the best record in forensics for
the whole College course.

CLARA H. WALDO PRIZES

The Clara H. Waldo Prizes are awarded on a basis of both scholarship and general achievement as follows: (a) Proficiency in literary and scholastic attainments; (b) Success in student activities; (c) Qualities of womanhood; (d) Qualities of leadership. The selection is made by a joint arrangement between faculty and students. To the senior woman selected, a prize of forty dollars is awarded; to the junior woman, thirty dollars; to the sophomore woman, twenty dollars; and to the freshman woman, ten dollars. Students receiving second and third place in each class are given Honorable Mention.

SELECTIONS FOR JUNE 1916

SENIORS

Geraldine Newins, Patchogue, New York
Gertrude Acheson, Portland, Oregon
Minnie Kalbus, Chehalis, Washington

JUNIORS

Martha Henrietta Bechen, Hillsboro, Oregon
Iva May Howey, Coquille, Oregon
Edna Clara Conner, Sheridan, Oregon.

SOPHOMORES

Marie Katherine Howells, Medford, Oregon
Helen Frances Dougherty, Baker, Oregon
Bernice Forest, Portland, Oregon

FRESHMEN

Christine Gordon Abbott, Roseburg, Oregon
Ethel Elaine Walker, Corvallis, Oregon
Florence Ernestine Berchtold, Corvallis, Oregon.

COMPARATIVE ENROLLMENT

1888-1889	97	1903-1904	530
1889-1890	151	1904-1905	680
1890-1891	201	1905-1906	735
1891-1892	208	1906-1907	833
1892-1893	282	1907-1908	1156
1893-1894	240	1908-1909	1352
1894-1895	261	1909-1910	1591
1895-1896	397	1910-1911	1778
1896-1897	316	1911-1912	2868
1897-1898	336	1912-1913	2314
1898-1899	388	1913-1914	2435
1899-1900	405	1914-1915	4176
1900-1901	436	1915-1916*	3251
1901-1902	448	1916-1917**	3797
1902-1903	541		

The great difference in the total enrollment for the two years, 1910-11 and 1911-12, was due largely to the increase in the number of students registered for the winter short courses in Agriculture. The increase in the number of regular students in the 36-weeks courses was 24 percent.

The decrease in the number of students in 1912-13 from the year 1911-12 is due to the decrease in the short course registration. The increase in the number of regular students in the 36-weeks courses was 19 percent.

* Totals to and including March 16, 1916.

** Totals to and including April 25, 1917.

SUMMARIES *

CLASSIFIED AS TO COURSE

(All Duplicates Excluded)

Course	Men	Women	Total
Agriculture	569	7	576
Forestry	66		66
Logging Engineering	19		19
Home Economics		411	411
Engineering and Industrial Arts.....	271	1	272
Mining	93		93
Commerce	149	63	212
Pharmacy	57	6	63
Optional	8	53	61
Music	16	31	47
Summer School	144	223	367
Winter Short Courses	1002	608	1610
Totals	2394	1403	3797**

* The enrollment statistics include only those who have pursued work at the College; correspondence students are omitted.

** Total to and including April 25, 1917.

CLASSIFIED AS TO RESIDENCE

(All Duplicates Excluded)

States and Territories:		South Dakota	2
Oregon	3135	Tennessee	1
Alaska		Texas	2
Arizona	5	Utah	6
California	205	Washington	191
Colorado	10	West Virginia.....	1
Connecticut	1	Wisconsin	3
Hawaii	3	Wyoming	1
Idaho	50		611
Illinois	20		3746
Indiana	7	Foreign Countries:	
Iowa	9	Argentina	1
Kansas	6	Australia	1
Maine	3	Canada	18
Maryland	2	China	3
Massachusetts	5	Denmark	1
Michigan	2	England	4
Minnesota	6	Finland	1
Missouri	1	Germany	1
Montana	21	India	13
Nebraska	5	Japan	2
Nevada	3	Nicaragua	1
New Hampshire.....	1	Norway	1
New Jersey.....	1	Russia	2
New York.....	4	Scotland	1
North Dakota.....	4	Sweden	1
Ohio	9		51
Oklahoma	6		
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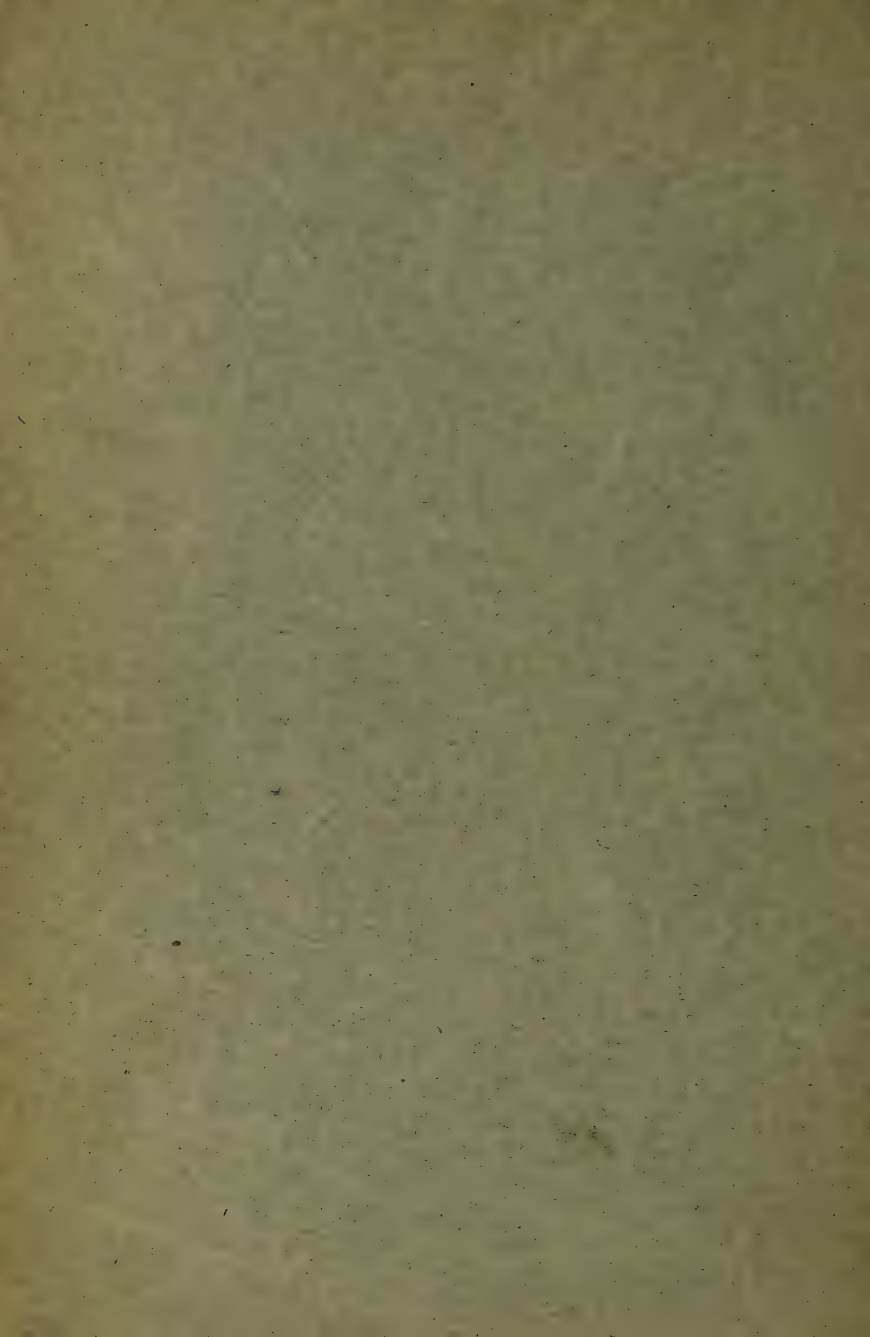
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OREGON SEP 18 1919
AGRICULTURAL COLLEGE
BULLETIN



College Catalogue, 1918-19

WITH LIST OF STUDENTS FOR ~~1917-18~~

CORVALLIS, OREGON

CATALOGUE
OF THE
Oregon Agricultural College
FOR
1918-19

With List of Students for 1917-18



CORVALLIS, OREGON
May 15, 1918

COLLEGE PRINT SHOP
1918

CALENDAR 1918-1919

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COLLEGE CALENDAR 1918-1919

1918.

September 20, Friday—Quarterly meeting of Board of Regents.
September 23, 24, Monday, Tuesday—Registration and examinations for admission.
September 25, Wednesday—Recitations begin.
November 4, Monday—Winter Short Course begins.
November 4, Monday—Forestry Short Course begins.
November 28, Thursday—Thanksgiving, a legal holiday.
December 21, Saturday—Winter Short Course ends.
December 21, Saturday (noon)—Christmas recess begins.

1919.

December 30 - January 4, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday—Farmers' and Home Makers' Week and Rural Life Conferences.
January 6, Monday—Regular exercises resumed.
January 8, Wednesday—Quarterly meeting of Board of Regents.
January 25, 27, 28, 29—Saturday, Monday, Tuesday, Wednesday—First semester examinations.
February 3, 4, Monday, Tuesday—Second semester registration.
February 12, Wednesday—Recitations begin.
February 22, Saturday—Washington's birthday; a legal holiday.
April 2, Wednesday—Quarterly meeting Board of Regents.
April 11, Friday—Forestry Short Course ends.
May ————— Military inspection day.
May 30, Friday—Memorial Day; a legal holiday.
June 1, Sunday—Baccalaureate sermon.
June 2, Monday—Senior Class Day exercises; Alumni Reunion.
June 3, Tuesday—Commencement exercises.
Final examinations for the second semester will be held on Tuesday afternoon, June 3; Wednesday, June 4; Thursday, June 5; and Friday, June 6.
June 9, Monday—Summer session begins.
July 19, Saturday—Summer session closes.

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	Term Expires
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HON. H. VON DER HELLEN.....	Wellen, 1921
HON. GEO. M. CORNWALL.....	Portland, 1921
HON. CLARA H. WALDO.....	Portland, 1924
HON. N. R. MOORE.....	Corvallis, 1924
HON. JEFFERSON MYERS.....	Portland, 1924
HON. J. K. WEATHERFORD.....	Albany, 1927
HON. C. L. HAWLEY.....	McCoy, 1927
HON. M. S. WOODCOCK.....	Corvallis, 1927

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ALFRED DAVID BROWNE, M. D.,
Director of Physical Education.

JOSEPH AMOS PIPAL,
Professor of Physical Education.

JOHN POMOROY VAN ORSDEL,*
Professor of Logging Engineering.

ELMER POLIC JACKSON, B. S.,
Superintendent of Buildings.

LESTER LOVETT, B. S.,
Professor of Entomology; Chief in Entomology, Experiment Station.

ARTHUR LEE PECK, B. S.,
Professor of Landscape Gardening and Floriculture; Superintendent
of Campus and Greenhouses.

ARTHUR GEORGE BOUQUET, B. S.,
Professor of Vegetable Gardening; Vegetable Gardening Specialist,
Experiment Station.

WILLIAM JAMES GILMORE, B. S. A. E.,
Professor of Farm Mechanics.

RALPH KEMPTON STRONG, Ph. D.,
Professor of Industrial Chemistry.

CONDE BALCOM McCULLOUGH, C. E.,
Professor of Civil Engineering.

PHILIP MARTIN BRANDT, B. S., A. M.,
Professor in Dairy Husbandry; Chief in Dairy Husbandry,
Experiment Station.

* On leave of absence.

THOMAS F. MAGINNIS,

Captain U. S. Army, Retired; Professor of Military Science and
Tactics; Commandant of Cadets.

HARRY PERCY BARROWS, M. S.,
Professor of Agricultural Education.

EDWIN THOMAS REED, B. S., A. B.,
College Editor.

FRANK HENRY SHEPHERD, A. M.,*
Professor of Industrial Education

JESSE FRANKLIN BRUMBAUGH, A. M., LL. B.,
Professor of Psychology.

ELMER WALKER HILLS, A. B., J. D.,
Professor of Office Training.

HELEN LEE DAVIS, A. B., B. S.,
Professor of Household Arts.

ALMA GRACE JOHNSON, B. S.,
Professor of House Administration.

MARK CLYDE PHILLIPS, B. M. E.,
Associate Professor of Mechanical Engineering; Superintendent
of Heating.

RENTON KIRKWOOD BRODIE, M. S.,*
Associate Professor of General Chemistry.

HAROLD STEPHENSON NEWINS, Ph. B., M. F.,*
Associate Professor of Forestry.

WINFRED McKENZIE ATWOOD, Ph. D.,
Associate Professor of Plant Physiology.

EDWARD BENJAMIN BEATY, B. S., M. A.,
Associate Professor of Mathematics.

IDA BURNETT CALLAHAN, B. S.,
Associate Professor of English Language and Literature.

GODFREY VERNON COPSON, M. S.,
Associate Professor of Bacteriology.

EDWARD BLODGETT FITTS,
Associate Professor of Dairy and Animal Husbandry, Extension
Service.

* On leave of absence.

WALTER SHELDON BROWN, A. B., M. S.,
Associate Professor of Horticulture and Crop Pests, Extension
Service.

CHARLES VLADIS RUZEK, B. S. A.,
Associate Professor of Soils, Assistant in Soils, Experiment
Station.

ORAN MILTON NELSON, B. S.,
Associate Professor of Animal Husbandry; Associate in Animal
Husbandry, Experiment Station.

CHARLES EDWARD NEWTON, E. M.,
Associate Professor of Metallurgy.

NEWELL HOWLAND COMISH, M. S.,
Associate Professor of Economics and Sociology.

HARRY CASE SEYMOUR,
State Leader Industrial Clubs, Extension Service.

NICHOLAS TARTAR, B. S.,
Assistant Professor of Mathematics.

SIGURD HARLAN PETERSON, B. A.,
Assistant Professor of English.

LAWRENCE FISHER WOOSTER, B. S. A.,
Assistant Professor of Electrical Engineering; Superintendent of
Light and Power.

WILLIAM ALFRED BEVAN, B. S.,*
Assistant Professor of Physics.

WILLIAM EVANS LAWRENCE, B. S.,
Assistant Professor of Botany.

SARAH LOUISE LEWIS,*
Assistant Professor of Household Science.

CHESTER COLLINS MAXEY, Ph. D.,
Assistant Professor of Government and Business Law.

ALICE MARKS DOLMAN, M. S.,
Assistant Professor of Household Administration.

HELEN JULIA COWGILL, B. S.,
Assistant State Leader of Industrial Clubs, Extension Service.

* On leave of absence.

ANNA MAE TURLEY, B. S.,

Assistant Professor of Home Economics, Extension Service.

GEORGE EDWARD GOODSPEED, Jr., B. S.,

Assistant Professor of Geology.

LAWRENCE EUGENE ROBINSON, B. S.,

Assistant Professor of Rural Architecture.

SAMUEL MICHAEL PATRICK DOLAN, C. E.,

Assistant Professor of Civil Engineering.

CHARLES ELMER OWENS, A. M.,

Assistant Professor of Plant Pathology.

MARION BERTICE McKAY, M. S.,

Assistant Plant Pathologist, Experiment Station.

LOUIS AUGUST RUFENER, Ph. D.,*

Assistant Professor of Economics and Sociology.

OTTO BERGER GOLDMAN, B. S.,

Assistant Professor of Mechanical Engineering.

LOREN BURTON BALDWIN, A. M.,

Assistant Professor of English.

LUCY MAY LEWIS, A. B., B. L. S.,

Assistant Librarian, Reference Librarian.

BERTHA DAVIS, M. S.,*

Assistant Professor of Home Economics Education.

EDGAR LeROY WESTOVER, B. S.,

Field Dairyman, Extension Service.

VINCENT DICK CHAPPELL, M. S.,

Assistant Professor of Dairy Husbandry.

EZRA JAMES FJELDSTED, B. S.,

Assistant Professor of Animal Husbandry.

CHARLES EDWIN THOMAS, M. E.,

Assistant Professor of Experimental Engineering.

HELEN MARGARET GILKEY, Ph. D.,

Assistant Professor of Botany; Curator of the Herbarium.

JOHN HICKS, Ph. D.,

Assistant Professor of General Chemistry.

* On leave of absence.

WILLIAM HODGE, M. A.,
Assistant Professor of Organic Chemistry.

HATTY DAHLBERG, M. S.,
Assistant Professor of Home Economics Education.

SIBYLLA HADWEN,
Housekeeper Women's Dormitories, Preceptress, Waldo Hall.

HAZZLITT VICKERS,
Assistant Director, Extension Service.

EDWIN MONROE SMITH,
Chief Clerk, Business Office.

HELEN LUCILE HOLGATE, B. S.,
In charge of College Exchange.

LESTER LINGLE, A. B.,
Assistant Professor of Horticultural Products.

HARRY LYNDEN BEARD, B. S.,
Assistant Professor of Mathematics; Director of Cadet Band.

ERWIN BERTRAN LEMON, B. S.,
Assistant Professor of Accounting.

GILBERT BRUCE BLAIR, A. M.,
Assistant Professor of Physics.

ASA CHANDLER, Ph. D.,
Assistant Professor of Zoology and Physiology.

ALDEN FORREST BARSS, A. B., M. S.,
Assistant Professor of Pomology.

PAUL STANLEY LUCAS, B. S. A.,
Assistant Professor of Dairy Manufacture.

HOVEY CLYDE McDONALD,
Assistant Professor of Physical Education for Men.

BERNARD FRANCIS SHEEHAN, M. S.,
Assistant Professor of Farm Crops.

CHARLES STOCKTON BREWSTER, M. S.,
Assistant Professor of Poultry Husbandry.

REGINALD HEBER ROBINSON, M. S.,
Assistant Chemist, Experiment Station.

ERNEST CHARLES HOBBS,
Superintendent of Print Shop.

INSTRUCTORS AND ASSISTANTS

WILLIAM McCAULLY PORTER,
Instructor in Forging.

GENEVIEVE BAUM-GASKINS,
Instructor in Pipe Organ and Piano.

GERTRUDE EWING McELFRESH, A. B.,
Instructor in English.

MAY BABBITT-RESSLER,
Instructor in Piano.

AMBROSE ELLIOTT RIDENOUR, B. S.,
Instructor in Foundry Practice.

CHARLES GEORGE WILTSHIRE,
Instructor in Plumbing and Steam Fitting.

JOSEPH BENJAMIN YODER, B. S.,*
Instructor in Mechanical Drawing.

DARWIN GREENE THAYER, B. S.,
Instructor in Woodworking.

CHARLES JARVIS McINTOSH, B. S.,
Instructor in News Writing; Editor of Press Bulletins.

JOHN HARRISON BELKNAP, B. S.,*
Instructor in Physics.

GRACE ROSAAEN SIEFERT,
Instructor in English.

HELEN PEER ROBINSON,
Instructor in Household Art.

RUSSELL MARION HOWARD, B. S.,
Instructor in Accounting.

CHRISTIE MOORE, B. S.,
Instructor in Household Science.

LILLIAN MABEL GEORGE, B. L. S.,
In Charge of Continuations Department, Library.

KATHERINE BARBARA HAIGHT,
Preceptress, Cauthorn Hall.

* On leave of absence.

EDNA MAY FLARIDA,

Instructor in Art.

DEXTER RALPH SMITH, B. S.,

Instructor in Civil Engineering.

CORA PLATT MILLER,

Instructor in Household Art.

WILLIS DHU AINE PEASLEE, E. E.,*

Instructor in Electrical Engineering.

ROBERT ANDREW DUNCAN, A. M.,*

Instructor in Chemistry.

ETHA MABEL MAGINNIS,

Instructor in Stenography.

LEONARD JOHN ALLEN, M. S.,

In charge Pig Club Work, Extension Service.

MELISSA MARGARET MARTIN,

Instructor in Modern Languages.

JUNE SEELEY, B. S.,

Instructor in Household Art.

IRWIN LEONARD BETZEL, B. S.,*

Instructor in Pharmacy.

LAURA CHENEY, B. S.,

Instructor in Household Science.

SYLVESTER BOYER, A. B.,*

Instruction in Chemistry.

EDITH FREEMAN SHERMAN,

Instructor in Art.

MARGARET MOREHOUSE, B. S.,

Instructor in Household Art.

WILLARD JOSEPH CHAMBERLIN, B. S.,*

Instructor in Entomology; Assistant in Entomology, Experiment Station.

CHARLOTTE NEVIL HURD, A. M.,

Instructor in Zoology.

MINNIE KALBUS, B. S.,

Assistant State Leader in Home Economics, Extension Service.

* On leave of absence.

OREGON AGRICULTURAL COLLEGE

CLYTIE MAY WORKINGER,
Secretary to Director of Experiment Station.

HARRISON DUANE LOCKLIN, M. S.,*
Instructor in Pomology.

GUSTAV DUNKELBERGER, M. B.,*
Instructor in Piano.

MARTIN LOUIS GRANNING,
Instructor in Machine Shop.

LAURA CAMPBELL,
Instructor in Physical Education for Women.

CYRUS FRANKLIN DUGGER,*
Post Commissary Sergeant, U. S. Army, Retired; Assistant
Commandant; Post Adjutant.

DENIS HAYES,*
Regimental Sergeant Major, U. S. Army, Retired; Assistant
Commandant; Post Quartermaster.

HARRY GEORGE MILLER, M. S.,
Assistant Chemist, Experiment Station.

HOWARD MARSHALL WIGHT, B. S.,*
Instructor in Zoology.

LOUISE ALBERTA SCHNEIDER,
Instructor in Household Art.

DALE EVERETT RICHARDS, B. S.,
Instructor in Animal Husbandry.

WALLACE LaDUE KADDERLY, B. S.,
Farm Management Specialist, Extension Service.

INEZ BOZORTH, B. S.,
Instructor in Institutional Management.

FRANK LLEWELLYN BALLARD, B. S.,
Field Organizer, Bureau of Organization and Markets.

FRANK HEIDTMAN LATHROP, B. S., A. B.,
Instructor in Entomology; Assistant Entomologist, Experiment
Station.

SARA WATT PRENTISS, B. S.,
Instructor in Household Science.

* On leave of absence.

JOHN JACOB KARSTETTER, B. S.,
Instructor in Mechanical Engineering.

MARY ELIZABETH KOLL, B. S.,
Instructor in Household Science.

EARL GILBERT, B. S.,
Instructor in Chemistry.

FREDERICK CHARLES KENT, A. B.,
Instructor in Mathematics.

EVA BRUNELL,
Instructor in Physical Education for Women.

CHARLOTTE MACDOUGALL, B. A.,
Instructor in Physical Education for Women.

CARL GRISSSEN,
Instructor in Stringed Instruments, Director College Orchestra.

ALPHONSUS ISADORE O'REILLY,
Assistant State Leader Boys' and Girls' Club Work.

ALICE VIRGINIA JOYCE,
Assistant State Leader Boys' and Girls' Club Work.

LEON WALTON WING, B. S., M. A.,*
Instructor in Dairy Husbandry.

JESSIE BILES, A. B.,
Instructor in Household Art.

AMBROSE REUBEN NICHOLS, B. S.,
Instructor in Industrial Education, Critic Corvallis High School.

LURA AMELIA KEISER, B. S.,
Instructor in Home Economics Education, Critic Corvallis High School.

JESSIE DUNLAVEY McCOMB, M. S.,
Assistant State Leader in Home Economics, Extension Service.

WALTER JACOB KOENIG, B. S.,
Instructor in Agricultural Education, Critic Corvallis High School.

LILLIAN BURNS, B. S.,
Instructor in Stenography.

HAROLD ROY TAYLOR, B. S. A.,
Instructor in Dairy Husbandry.

* On leave of absence.

CLAIR WILKES, B. S. A.,
Instructor in Farm Management.

GEORGE SPENCER MONK, S. B.,
Instructor in Physics.

MARY VAN KIRK,
Instructor in Household Art.

ROBERT PRESTON, M. A.,
Instructor in General Chemistry.

HAROLD KELLY, B. S.,
Instructor in Agricultural Chemistry.

MARY HARTZELL, M. A.,
Instructor in Chemistry of Foods.

WILLIAM DREESEN, Ph. D.,
Instructor in Political Economy.

MARTHA BECHEN, B. S.,
Home Economics Demonstrator.

RUTH LILLYN CORBETT, B. S.,
Home Economics Demonstrator.

ANNA ELIZABETH McCORMICK, B. S.,
Home Economics Demonstrator.

EDNA LOLA MILLS, B. S.,
Home Economics Demonstrator.

CLARA MAY MURPHY, B. S.,
Home Economics Demonstrator.

LORENE AUGUSTA PARKER, B. S.,
Home Economics Demonstrator.

GRACE MAY COLE, B. A.,
Assistant in Seed Testing Laboratory.

MARGARET FARQUHAR COOK,
Secretary of the Extension Service.

McKINLEY HUNTINGTON, B. S.,
Assistant State Pig Club Leader.

BERTHA HERSE, B. S.,
In charge Circulation Department in Library.

LILA GRACE DOBELL, B. S.,

Assistant in Library.

DELOSS EVERETT BULLIS, B. S.,

Assistant in Agricultural Chemistry.

HARRY AUGUST SCHOTH, M. S.,

Scientific Assistant U. S. Department of Agriculture Forage
Investigations.

THOMAS EVERETT MAY, B. S.,*

Assistant Coach and Manager of Athletics.

ETHEL ALLEN, B. S.,

Assistant in Library.

ANDREW EDWARD MURNEEK, M. S.,

Research Assistant in Horticulture.

FRED WILHELM MILLER, D. V. M.,*

Fellow in Veterinary Medicine.

JOHN PITMAN, B. S.,

Fellow in Soils.

LEWIS TAYLOR BUCKMAN, B. S.,

Fellow in Horticulture.

IVA OWENS LANCE,

Secretary to Dean of the School of Home Economics.

* On leave of absence.

SUPERINTENDENTS OF BRANCH EXPERIMENT STATIONS

EASTERN OREGON BRANCH EXPERIMENT STATION

ROBERT WITHYCOMBE, B. S.,

Union.

UMATILLA BRANCH EXPERIMENT STATION

HAROLD KARL DEAN, B. S.,

Hermiston.

SHERMAN COUNTY DRY-FARM BRANCH EXPERIMENT
STATION.

DAVID EDMUND STEPHENS, B. S.,

Moro.

SOUTHERN OREGON BRANCH EXPERIMENT STATION

FRANK CHARLES REIMER, M. S.,

Talent.

HARNEY VALLEY BRANCH EXPERIMENT STATION

JOHN MARTIN,

Burns.

JOHN JACOB ASTOR BRANCH EXPERIMENT STATION

ALBERT EDWARD ENGBRETSON, B. S.,

(Acting Superintendent),

Astoria.

HOOD RIVER BRANCH EXPERIMENT STATION

LEROY CHILDS, B. S.,

Entomologist, Experiment Station,

GORDON GEORGE BROWN, B. S.,

Horticulturist, Experiment Station,

Hood River.

COUNTY AGRICULTURISTS

HAROLD ROLAND GLAISYER, B. S.,
Klamath County.

ROY CLAUDE JONES, B. S.,
Tillamook County.

JAY LATTIMER SMITH, B. S.,
Coos County.

CLAUDE CLIFTON CATE, B. S.,
Jackson County.

SYLVESTER BENJAMIN HALL, B. S.,
Multnomah County.

MANNES SEYMOUR SHROCK,
Umatilla County.

ARTHUR CHASE, B. S.,
Wasco County.

PAUL HERMAN SPILLMAN, B. S.,
Union County.

CHARLES THOMPSON, M. S.,
Josephine County.

NEWELL ROBB, B. S.,
Lane County.

D. C. HOWARD, B. S.,
Columbia County.

CALVIN JEHU HURD,
Douglas County.

MAC HOKE, B. S.,
Wallowa County.

ROY ALLEN WARD,
Crook and Deschutes Counties.

FRANK ROSS BROWN, B. S.,
Morrow County.

NEAL CLEMENT JAMISON, B. S.,
Washington County.

GEORGE KABLE,
Benton County.

HENRY TWEED,
Baker County.

RALPH WALDO ARENS, B. S.,
Clackamas County.

STANLEY VAN SMITH, B. S.,
Linn County.

ALBERT ALLEN ASBAHR, B. S.,
Lincoln County.

CLAUDE CLARK CALKINS, B. S.,
Sherman County.

HERWYGH LECHNER, B. S.,
Clatsop County.

JOE CEPHAS HAWKINS, B. S.,
Gilliam County.

OUTLINE OF COURSES OF STUDY

The Oregon Agricultural College offers the following courses of study, each of which extends over four years and leads to the degree of Bachelor of Science:

(Arranged alphabetically by schools and departments.)

In the **School of Agriculture**, major courses in—

- | | |
|--------------------------------|----------------------------|
| (a) Agriculture (general) | (h) Farm Crops |
| (b) Agricultural Chemistry | (i) Farm Management |
| (c) Animal Husbandry | (j) Farm Mechanics |
| (d) Bacteriology | (k) Horticulture |
| (e) Botany and Plant Pathology | (l) Poultry Husbandry |
| (f) Dairy Husbandry | (m) Soils |
| (g) Entomology | (n) Zoology and Physiology |

In the **School of Commerce**, major courses in—

- | | |
|------------------------------|-----------------------------------|
| (a) Accounting and Bus. Man. | (c) Government and Bus. Law |
| (b) Economics and Sociology | (d) Stenography and Office Train. |

In the **School of Engineering**, major courses in—

- | | |
|----------------------------|----------------------------|
| (a) Civil Engineering | (d) Industrial Arts |
| (b) Electrical Engineering | (e) Irrigation Engineering |
| (c) Highway Engineering | (f) Mechanical Engineering |

In the **School of Forestry**, major courses in—

- | | |
|----------------------|-------------------------|
| (a) General Forestry | (b) Logging Engineering |
|----------------------|-------------------------|

In the **School of Home Economics**, major courses in—

- | | |
|-----------------------|------------------------------|
| (a) Household Art | (c) Home Administration |
| (b) Household Science | (d) Institutional Management |

In the **School of Mines**, major courses in—

- | | |
|-------------------------|------------------------|
| (a) Ceramic Engineering | (c) Mining Engineering |
| (b) Geology | |

In the **School of Pharmacy**, a course in—

- | |
|--------------|
| (a) Pharmacy |
|--------------|

In the **School of Vocational Education**, major courses in—

- | | |
|----------------------------|------------------------------|
| (a) Agricultural Education | (c) Home Economics Education |
| (b) Commercial Education | (d) Industrial Education |

In the department of **Chemical Engineering**, a course in—

- | |
|--------------------------|
| (a) Chemical Engineering |
|--------------------------|

In addition to the above baccalaureate courses, provision has been made for the following:

1. A two-years course in Pharmacy leading to the degree of Ph. G., and
2. Vocational courses, varying in length from 6 months to three years, as follows:

- A. Agriculture (one year).
- B. Business Short Course (two years).
- C. Dairying (one year).
- D. Dietitians' Course (two years).
- E. Forestry (November 4 to April 11).
- F. Home-Makers' Course (one year).
- G. Mechanic Arts (three years).

The **School of Music**, an affiliated self-supporting department, offers instruction in voice, piano, pipe organ, violin, orchestra, and band instruments.

SPECIAL NOTICE

NEW REGULATION ADOPTED BY THE BOARD OF REGENTS AT THEIR JUNE, 1918, MEETING.

Late Registration. Every student not registering on the regularly scheduled registration days of either semester will be required to pay late registration fees as follows:

\$1.00 for the first day late;

\$1.00 for each additional day up to a total of \$5.00.

Five dollars shall be the maximum fee. In all cases the fees will be collected as are all other fees, when the student registers.

GENERAL INFORMATION

FOUNDATION AND ENDOWMENT

In pursuance of an Act of Congress, approved by President Lincoln, July 2, 1862, a grant of land to the amount of thirty thousand acres, or its equivalent, was made to each state in the Union for each senator and representative in Congress to which the state was entitled by the apportionment of the census of 1860. The proceeds under this Act were to constitute a perpetual fund. The principal of this fund was to remain forever undiminished: but the interest arising from the fund was to be inviolably applied by each state that should avail itself of the benefits of the Act, to the support and maintenance of a "College where the leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislature of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." Ninety thousand acres of land were apportioned to Oregon; and by an Act approved October 9, 1862, the Legislative Assembly of Oregon accepted the provisions of the Congressional law.

FUNDS

Funds for the support of the College in its three grand divisions of work, Resident Instruction, Experiment Station, and Extension Service, are derived both from the National Government and the State of Oregon as follows:

FOR RESIDENT INSTRUCTION

From the National Government:

The Land-Grant Fund. The sale of the public land has netted the College approximately \$200,000. This at present is invested in securities bearing six percent interest. The Act of Congress of 1862 explicitly demands that no part of the funds so appropriated, or the interest arising therefrom, shall be used for the purchase, erection, or maintenance of any building or buildings. The interest on this fund for 1917-18 is \$11,500.

The Morrill Fund. On August 30, 1890, an act was passed by Congress "to apply a portion of the proceeds of the public land to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under the provisions of the Act of 1862." This act provides an annual fund of \$50,000.

From the State of Oregon:

The Millage Tax. The College is chiefly dependent for maintenance upon the income from the millage tax, as provided by the State legislature of 1913, which became operative April 1, 1915. The income from this source for the year 1917-18 is \$356,490.

The State legislature of 1917 made a special appropriation of \$65,000 to apply toward the erection of a library building.

From miscellaneous entrance fees, etc., for the year 1917-18, Resident Instruction work derived an income of \$11,018.

FOR EXPERIMENT STATION

Funds for the experimental work of the College, which is conducted both at the Corvallis Station and at seven branch stations located in different parts of the State, are derived from the National Government and from the State as follows:

From the National Government:

The Hatch Fund. Under an act of Congress, approved March 2, 1887, the College receives \$15,000 a year for the maintenance of an Agricultural Experiment Station, "to aid in acquiring and diffusing among the people useful and practical information on subjects connected with agriculture."

The Adams Fund. An act of Congress, approved March 20, 1906, appropriated an initial \$5,000 for that year, and \$2,000 additional for each year thereafter until the annual amount should reach \$15,000. This fund is "to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry" of the State, and therefore supplements the Hatch Fund in the maintenance of the Experiment Station.

For the support of the Branch stations at Moro, Hermiston, and Burns, the National Government appropriates \$6,700.

From the State of Oregon:

State Funds. The State legislature of 1917 appropriated \$5,000 annually for the Corvallis station and an additional \$10,000

annually on condition that the National Government appropriate an equal sum. The State also appropriates \$28,000 annually for the support of the branch stations. Of this sum, \$3,000 appropriated for the Hood River Branch Experiment Station is conditioned upon the county's appropriating \$2,000 for the support of the same station.

FOR EXTENSION SERVICE

From the National Government:

The Smith-Lever Fund. This fund was established by the Smith-Lever Agricultural Extension Act passed by Congress May 8, 1914. By its provisions the Oregon Agricultural College received \$10,000 from the Federal Government to apply towards the support of the Extension Service for the fiscal year ending June 30, 1915. This sum is to be increased annually for seven years until the total amount of \$30,200 is reached. This amount will continue as a permanent appropriation as long as an equal sum be "appropriated for that year by the legislature" of the State, "or provided by State, county, college, or local authorities, or individual contributions within the State for the maintenance of the cooperative agricultural extension work provided for in this Act."

The fund for the fiscal year July 1, 1917, to June 30, 1918, amounts to \$21,856. Since the State's obligation under this Act is fulfilled by matching the Government's increase over the original \$10,000, the sum of \$11,856, which the State contributed to this work was taken from the total sum of \$25,000 appropriated by the State for General Extension Work (p. 27).

Department of Agriculture Funds. The United States Department of Agriculture appropriates this year \$16,120 for cooperative work through Industrial Clubs, County Agents, Special Dairy Work, Marketing and Rural Organizations, and Farm Management and Business Demonstrations. The appropriation, however, is conditioned upon the State's granting an equal sum for the same purposes.

War Emergency. To assist in establishing county agents, home demonstration agents, and junior club work throughout the State as an emergency war measure, the Government appropriated in 1917-18 \$50,300.

From the State of Oregon:

For General Extension Work. The State appropriates \$25,000 for general extension work, including movable schools, lectures,

publications, Farmers' and Home-Makers' Week, correspondence, demonstrations in agriculture and home-making. From this fund money is set aside to meet the Smith-Lever requirements, which increase from year to year by about \$3,700. The fund is therefore more restricted in its uses every year.

For Cooperative Work. For cooperative work with the United States Department of Agriculture the State appropriates \$15,000 a year, to meet the requirements already indicated.

For County Agent Work. To meet the appropriations made by the several counties for maintaining the work of the county agents, the State is now appropriating approximately \$30,780 a year.

HISTORY

As there were no State colleges in Oregon in 1868, the legislature of that year, which provided for the location of the land received under the Act of 1862, gave the interest on the funds derived from the sale of the land to the Corvallis College, a private institution in Benton County, which was then under the control of the Methodist Episcopal Church, South. For a number of years, none of the land granted was sold, and the legislature made small annual appropriations for the support of the school.

In 1885, the church voluntarily relinquished its claim on the funds of the College, and the State assumed entire control of the institution. The legislature of that year provided for the "permanent location of the State Agricultural College at Corvallis, in Benton County," on condition that the citizens of said county should, within four years, erect on the "farm containing thirty-five acres in the immediate vicinity of said city, known as the Agricultural College Farm, brick buildings for the accommodation of said State Agricultural College at a cost of not less than \$20,000." During the summer of 1887, the corner stone of the building erected by the citizens of Benton County was laid by the Governor of Oregon amid imposing ceremonies.

This structure, now known as the Administration building, was the nucleus around which other buildings soon began to cluster, as necessity and growing interest demanded. For a year or two there was ample room; but, as the institution grew, more land was needed and provided, and the institution now owns, instead of the thirty-five acres originally comprising the campus and grounds, three hundred and forty-nine acres; and instead of one

structure, thirty-six. There has also been a marked increase in the attendance, from ninety-seven to over four thousand students. Twenty years ago, most of the students came from Benton and neighboring counties. Today, every county in Oregon, 34 other states, and 15 territories and foreign countries are represented. The increase in the number of students called for an increase in the number of the faculty. This body, from the number of five in 1884, has grown until it now closely approaches two hundred. Other features usually found in connection with progressive educational institutions have grown in equal ratio. The courses have been strengthened, the standards, both for entrance and graduation, have been advanced, and other improvements have been made from time to time, which have added to the thoroughness and efficiency of the work.

ORGANIZATION

The Oregon Agricultural College is organized into the three grand divisions that characterize the work of the land-grant colleges throughout the country; namely, Resident Instruction, Experiment Station, and Extension Service. Resident Instruction, which includes all work of teaching students at the institution, is the most distinctive feature of the College life. It has always been regarded as of first importance, and will doubtless continue to be so regarded, in spite of the increasing usefulness of extension work. The Experiment Station, through systematic experiments, investigation, and research, is engaged in a search for fundamental truth. Its work is of great importance; for without it, the work of the other two grand divisions would soon become sterile and ineffective. The Extension Service, which is the newest of the three grand divisions of the College, includes all means of imparting the message of the College to the people in their own communities. It is virtually an effort to make practical and more or less immediate application throughout the State of the available truths worked out by the Experiment Station or used for resident instruction.

GOVERNMENT

The general government of the College is vested primarily in the Board of Regents, and, under their control, in four other administrative bodies—the Administrative Council, the College Council, the Faculty, and the staffs of the Experiment Station

and Extension Service. These bodies, in the exercise of their respective duties, determine the questions of policy and regulate all matters relating to the interests of the institution.

The Board of Regents consists of thirteen members, of whom the Governor, the Secretary of State, the Superintendent of Public Instruction, and the Master of the State Grange, are ex-officio members. The nine other members are appointed by the Governor with the approval of the State senate, and hold office for a term of nine years. Under a law of the State legislature, passed in 1885, the Board of Regents constitutes a body corporate, under the name of "The Board of Regents of the State Agricultural College, * * with power to sue and be sued, and to make contracts," and to enact such regulations as may be necessary for the maintenance and development of the College.

The Administrative Council consists of the President of the College, the Director of the Experiment Station, the Director of Extension, the Deans of the different Schools, and the Director of the Summer School. The function of this Council is to consider and determine the larger questions of policy and administration.

The College Council is composed of the President of the College and all officers of administration and instruction with the rank of professor, associate professor, or assistant professor. This body considers all general questions relating to the educational work and policy of the College; arranges and correlates the courses of study, and determines the requirements for admission and graduation. The different committees of the College Council, representing the several schools of instruction, have charge of the enrollment and progress of students in the respective schools, and investigate the records of all candidates for graduation.

The College Faculty comprises members of the Administrative Council and the College Council and all other instructors, including members of the Experiment Station and Extension Service Staffs. It considers routine questions of method and discipline, a function for which it is particularly well adapted, being in close contact with all that pertains to student interests and student life.

The Experiment Station Staff includes the President of the College, the Director of the Experiment Station, the heads of the various departments of the School of Agriculture, and all assistants, engaged in research and experimental work. The members

of this staff are engaged in the investigation of problems encountered in the development of the agricultural interests of the State. They also distribute, by means of correspondence, circulars, and station bulletins, information regarding their investigations.

The Extension Service Staff includes the President of the College, the Director of Extension Service, the Secretary of Extension Service, the State Leader and County Agents, the officers in charge of Boys' and Girls' Club Work, Extension Field Specialists in Horticulture, Dairy and Animal Husbandry, Agronomy, Poultry Husbandry, Organization and Markets, Highway Engineering, Home Economics, Farm Management Demonstrations, and members of the Resident Instruction Staff and Experiment Station Staff who assist in extension work.

Dean of Women. The position of the Dean of Women is administrative, supervisory, and advisory. It is the duty and privilege of the Dean of Women to know each girl so well that she may be of the greatest possible help and inspiration to her as adviser, counselor, and friend. The position covers the problems of living and social conditions, student employment, vocational guidance, and all problems which touch the young women's lives while they are in College.

The Student Affairs Committee, composed of members of the faculty, is designed to look after those interests of the students which are not strictly academic in character. It assists them in working out their social problems. It helps to maintain a wholesome relationship between clubs and fraternities and the College. It is prepared to assist student organizations in all their financial dealings. In short, the Committee strives to bring about those conditions which will make the student's college life of the greatest profit to him.

In order that freshman students may become acquainted early in their college life with student-body regulations and traditions and with college ideals, and that they may be more quickly welded into an effective class organization, a member of the Student Affairs Committee has been appointed to assist them in this work with the title Adviser for the Freshman Class. He advises them in the selection of special studies and in such other ways as may be of assistance to them.

The Students. The College does not undertake to prescribe in detail either its requirements or prohibitions. Students are met on

a plane of mutual regard and helpfulness. Since the advantages of the institution are provided at public expense, the students are under special obligation to perform faithfully all their duties, not only to the College, but also to the community and to the State. Whenever the deportment of any student is such that his influence is inimical to the interests of the institution, he will be relieved from further attendance.

PURPOSE AND SCOPE

The purpose of the College is to provide, in accordance with the acts of Congress under which it is maintained, a liberal, thorough, and practical education — an education that will afford the training required for efficient service in different branches of industry. The distinctive technical work covers the three great fields of production, manufacture, and commerce. Special attention is given to the application of science. All the practical work in the laboratories, in the shops, in the orchards, and on the farm, is based on scientific principles. While the industrial or technical work is emphasized, the importance of a thorough general training, of mind development, and of culture, is recognized in all of the work throughout the institution. The object is to meet the demand for a broad and general education, supplemented by special technical training.

The work, therefore, covers a broad field, including technical courses along the different lines of agriculture, forestry, home economics, engineering, mining, commerce, pharmacy, industrial education, and industrial arts; with the necessary training in the basic subjects of mathematics and the natural and physical sciences; and also the general training in language, literature, history, economics, political science, civics, military tactics, and physical education, which constitutes an essential part of a liberal education.

In all the work of the institution, the object is to train the mind, the eye, and the hand to act in unison; to unfold and co-ordinate the faculties of mind and body; to develop a symmetrical manhood and womanhood, and a just appreciation of clean, upright citizenship.

LOCATION

The seat of the Oregon Agricultural College is Corvallis, a city of six thousand inhabitants, situated at the head of navigation on the Willamette River. As the name implies, it is in the heart of the far-famed Willamette Valley. It is readily accessible by steam

and electric railway from all parts of the State; it has free mail delivery; there are many churches and no saloons, and the moral tone is equal to that of any city within the boundaries of the State.

Situated on high, well-drained land, open to the invigorating sea-breeze, Corvallis is one of the most healthful cities in the State. It has never been visited by any dangerous epidemic disease, and the possibilities of such visitation in the future appear remote; for the city has a complete modern sewerage system and first-class gravity water system, supplied from springs high up the slope of Mary's Peak, the tallest mountain in the Coast Range, some fifteen miles away to the westward. The city and its environs are conducive to wholesome student and home life. It has an ample supply of pure mountain water for all domestic and sanitary purposes. The atmosphere is purified and the climate ameliorated by almost constant ocean breezes — warm in winter and cool in summer. The surrounding landscape elicits praise from all who behold its delightful charms as viewed in the extensive area of fertile fields, gardens, and orchards. The wooded glens of the near-by foothills, and the lively mountain brooks, or the more pretentious streams frequented by canoe, row-boat, and launch parties, are fruitful sources of recreation; while the magnificent distant views to the eastward, where the fir-clad Cascade Mountains, with their wealth of trees and the perennially snow-capped sentinels — Hood, Jefferson, and the Three Sisters — present a constant panorama of picturesque mountain scenery. With such an environment, the city is truly an ideal location for a college and a home.

GROUNDS AND BUILDINGS

The College Grounds comprise three hundred forty-nine acres. That part of the grounds, ninety-one acres in extent, lying immediately about the several buildings, east of Cauthorn Avenue, and usually designated as the lawns and campus, is tastefully planted with both native and exotic ornamental trees, shrubs, and herbs. The one hundred and forty-three acres used for the farm, garden, and orchard operations, is so plotted and planted as to meet the demands of the various lines of work and still conform to a general scheme of landscape embellishment. This portion occupies a slightly elevated and gently undulating site wholly within the western limits of the city of Corvallis. In addition to the above plot,

one hundred and fifteen acres, comprising the College stock farm, together with the horticultural and poultry tracts, lies just south of the city limits. Broad drives and walks traverse the campus in all directions, thus rendering every objective point easily accessible. The numerous specimen trees, groups of shrubbery, and massed borders are a source of enjoyment as well as of instruction to all those who frequent the grounds. The scheme of planting has been such as to give an air of peaceful activity, orderly effort, earnest purpose, and quiet refinement. Daily association with such scenes for a period of years, during the time when men and women are forming the habits of thought and action that will be theirs through life, is certain to have a deep-seated and enduring influence for good in molding the character of future citizens.

The following brief descriptions will convey a general idea of the principal buildings and the purposes for which they are used:

The Administration Building is a three-story brick structure, 90 x 120 feet, containing recitation rooms, the library, the offices of the President, the Registrar, the Business Manager, and the Director of the School of Music. Centrally located and on a slight eminence, it commands an unsurpassed view of the campus, the city of Corvallis, and the picturesque Cascades.

Science Hall, situated southeast of the Administration building, and constructed of gray granite and sandstone, covers a ground space of 85 x 125 feet, has three stories and basement, and contains fifty-five rooms. It is one of the most serviceable buildings on the grounds, and within it are housed the departments of Chemistry and Pharmacy, with their various laboratories, recitation rooms, and lecture halls, together with the offices and laboratories of the Experiment Station chemists.

Agricultural Hall, standing southwest of the Administration Building, is the largest structure on the campus. It is an imposing edifice of brick and sandstone, consisting of the central or Administrative building, the north or Agronomy wing, and the south or Horticultural wing.

The central or Administrative building is 66 x 140 feet, four stories and basement, and contains conveniently arranged and well-lighted class rooms, laboratories, and offices. On the first floor are the offices of the Director of the Experiment Station and Dean of the School of Agriculture, the Director of Extension Ser-

vice, the State Leader of County Agriculturists, the State Leader of Industrial Clubs, with their several branches, the Editor of Publications, the Editor of Press Bulletins, and the College Exchange. The second floor is occupied by the department of Animal Husbandry, and the School of Industrial Education; the third floor, by the departments of Zoology and Entomology with their respective museums; and the fourth floor, by the departments of Bacteriology and Art.

The north or Agronomy wing is 72 x 130 feet, three stories high. It is thoroughly modern in all its equipment, and while intended solely for the work in Agronomy, at present accommodates also, temporarily, the School of Commerce. The first and second floors, occupied by the departments of Soils and Farm Management, Farm Mechanics, Farm Crops, and Drainage and Irrigation, contain, in addition to the offices of these departments, rooms variously devoted to laboratory and class purposes. All of the third floor and office rooms on the first and second floors are used by the School of Commerce.

The south or Horticultural wing is 72 x 130 feet, three stories high. In the basement are located laboratories for plant propagation, spraying, vegetable preparation, and fruit packing. The basement also contains the general storage rooms for the department, and rooms which are especially adapted for the storage of fruits. The first floor contains the offices of the division of Horticulture, the research laboratory, systematic pomology laboratory, and three large lecture rooms. The second floor contains the offices and museums of the department of Botany and Plant Pathology, recitation rooms, and student laboratories. The third floor contains the horticultural museum and horticultural herbarium, photograph room, large student lecture room, draughting rooms, lecture rooms, and office of the Landscape Gardening section. These rooms are all especially well lighted and contain every convenience for conducting the work with efficiency.

The Library Building. The much-needed new library building is located south of the Mines building. It consists of two stories and basement in front and three stories and basement at the back. It is built of red brick and gray terra cotta, presenting a quiet and dignified appearance, in keeping with the use, fundamental to education, to which it is to be put. The most modern and effective system of lighting, heating, and ventilating is installed.

The first floor consists of an entrance hall, two large lecture rooms for the use of one-credit and other classes too large to be accommodated by the class room of ordinary size; on this floor are the cloak rooms for the use of students. The second and third floors at the front are occupied by a large, light, convenient reading room ample to seat over three hundred students. This will accommodate both faculty and students, providing the quiet, commodious room needed for reference work; back of this room on the second floor are the offices, cataloguing and other work rooms. The third floor consists of comparatively small rooms designed ultimately for seminar rooms for the use of such of the departments as must make the library their chief laboratory; however, in the present condition on the campus, with its lack of recitation rooms and laboratories, this story must be largely given over for the present to meet this pressing need.

The northwest part of the library contains the fire-proof steel stack room which will house the formerly scattered collection of valuable books in safety, and permit their much easier, and more effective use.

The building is ample to accommodate the growth of the library for many years and its architecture permits, when time and growth demand it, sufficient stack expansion for many more.

Greenhouses. A range of greenhouses, aids the student in his studies in commercial greenhouse work. The range is made up of five even-span houses, three ninety feet long by twenty feet wide, and two thirty-three feet long by twenty feet wide, making the total area under glass 6,720 square feet. A hot-water heating apparatus has been installed, with valves and pipes so arranged that different temperatures can be maintained in every separate thirty feet of house in the three long houses. Each of the large houses has been divided into sections thirty feet long, so that the entire space in each may be given up to a single crop. Of the two smaller houses, one is given up to research work, and one to the propagation of plants in general. The central building is large and conveniently arranged for all work that is to be met with in greenhouse establishments. Such crops as carnations, chrysanthemums, violets, palms, ferns, general pot plants, and forced vegetables, like tomatoes, lettuce, and cucumbers, are grown in these houses.

Dairy Building. About sixty feet to the northward of the Agricultural building is located the Dairy building. The general

scheme of both outside and inside finish is similar to that of the Agricultural building. The structure is 54 x 141 feet, three stories high. On the first floor are located the offices of the Dairy department and commodious laboratories for butter-making, cheese-making, and market milk instruction, including a well-equipped boiler and engine room and student lockers. On the second floor are the testing laboratory, advanced laboratory, farm dairy and shop rooms, veterinary laboratories, etc. The third floor is temporarily occupied by the department of mathematics, with the exception of a general lecture room, extending across the south end of this floor, and having a seating capacity of two hundred.

The Forestry Building. A three-story Forestry building, eighty feet wide and one hundred and thirty-six feet long, has been constructed to house the work in forestry and logging engineering. This building contains roomy laboratories for work in silviculture, dendrology, mensuration, forest protection, technology, drafting, and logging engineering. As rapidly as material can be assembled these laboratories will be supplied with the various forms of instruments and equipment which the peculiar work of each requires. In addition to the laboratories, space is to be devoted to a collection of manufactured wood products, designed to show the various uses to which wood may be put, and to a forest museum in which will be assembled large specimens of all commercial woods of the United States. All available publications dealing with forestry and logging subjects are provided for the use of students. Portions of the building are used temporarily by the department of English and the department of Poultry Husbandry.

Home Economics. The first wing, 68 x 120 feet, of the new Home Economics building is occupied by the departments of Domestic Science and Domestic Art. The building is located directly west from the Dairy building. It consists of three stories above a high basement, and is finely built of brick and stone. Heating and ventilating systems of the most modern type are installed, and all provisions are made for the comfort and convenience of the young women carrying the work in Home Economics. Offices for the Professors of Domestic Science and Domestic Art and the assistants in both Domestic Science and Domestic Art, are on the first, second, and third floors.

The food laboratories are on the first and second floors, while the Domestic Art department has all of the third floor of the

building and part of the second floor. Ample locker and dressing rooms are provided for the convenience of the students, and hot and cold water is supplied in all parts of the building. The housing and equipment of the School of Home Economics, in short, are thoroughly modern, and adequate for immediate needs.

The Mines Building, which is 65 x 81 feet in dimensions, is located about 100 yards northwest of the Administration building, and is one of the newer buildings on the campus. This building forms the northern boundary of the quadrangle which is planned in the new building scheme on the College campus. It is a fine four-story structure, constructed of brick, trimmed with stone, and similar in type to Agricultural Hall. The first floor of the building contains the main offices, assaying, metallurgical and ore-dressing laboratories. The basement contains the crushing and sampling rooms, the ceramic laboratory, and the stock rooms. On the second floor will be found the Bureau of Mines laboratory and lecture and class rooms. On the third floor is the geological museum, the mineralogical and petrological laboratories, and draughting room. All the laboratories are provided with water, gas, electric lights, and steam heat.

Mechanical Hall, situated about one hundred and fifty yards northeast of the Administration building, is 90 x 120 feet, two stories high, and constructed of Oregon gray granite and sandstone. It is an attractive, substantial building, well arranged and admirably adapted to the purposes for which it is used. Besides recitation and lecture rooms for the classes in Industrial Arts, Mechanical, Electrical, Civil, Highway, Irrigation, and Experimental Engineering, it contains the Physical and Engineering laboratories.

Mechanical Arts Building is a modern, well-lighted structure of brick, with cement foundations, 52 x 52 feet, two stories high, flanked by a one-story wing on the east, 40 x 220 feet, and a similar wing on the south, 40 x 200 feet. The central portion contains the office of the Dean, a display room for student work, a tool room for the machine shop, and a finishing room for the wood shop. On the second floor is a general draughting room, 30 x 50 feet, with a commodious blue-print room and a dark room adjoining. The south wing contains the main woodworking shop, 40 x 97 feet, a stock room, 30 x 40 feet, a carpenter shop, 20 x 40 feet, and the College printing plant, 40 x 50 feet. The east wing

contains the machine shop, 40 x 80 feet, the blacksmith shop, 40 x 100 feet, store room for coal and iron, lockers, and toilet rooms.

The Foundry, which is located immediately south of the blacksmith shop, is built of brick. It contains one 22-inch Colliu cupola for melting iron, one brass furnace, one portable core oven, one stationary core oven for larger work, one twelve-hundred-pound crane ladle, one eight-hundred-pound crane ladle, and several smaller ladles. It contains also one crucible brass furnace, one two-ton jib crane, one post crane, one No. 2 Delano pulley molding machine, one tumbling barrel for cleaning castings, and a liberal supply of smaller tools, flasks, etc.

The Women's Gymnasium is situated about two hundred yards south of the Administration building, and is erected against a gently sloping bank on Jefferson street. The structure, 70 x 120 feet, is built of stone and wood, and comprises a high, airy basement, or first floor, facing east, with the main floor above it, having a bank entrance on the west end. The first floor of the building is devoted to locker rooms, dressing rooms, bathrooms, and offices, together with a rest room and a special room for corrective gymnastics. The second floor consists chiefly of one large gymnasium room, which is also frequently used as a lecture hall, assembly room, and social center for moderate-sized gatherings. This room, which comprises 8,000 feet of floor space, is surmounted by a balcony running track, suspended from the trusses. It affords facilities, in a court of 79 x 54 feet dimensions, for basketball, indoor baseball, tennis, and various winter and indoor games. The building affords ample accommodations for the physical training of all the women of the institution.

The Men's Gymnasium is situated immediately west of Waldo Hall on Jefferson street, adjoining the main athletic field. The structure is to consist of four units, the central part being 90 x 150 feet, with each wing 52 x 96 feet in dimensions. The fourth unit will provide a swimming pool 50 x 100 feet, of modern design and finish. Only two units were completed during 1914, the main hall and the east wing. The main hall is used as a lecture and assembly room, or a place for entertainments when large audiences are to be accommodated. The showers and the baths are of modern design, providing hot and cold water throughout the year. The floor of the main hall with its 13,500 square feet of surface,

provides space for three basketball courts, indoor baseball diamond, and space for various winter and indoor games. The east wing provides boxing and wrestling rooms, and an auxiliary gymnasium with special apparatus for use of the individual and for corrective gymnastics. When completed, the building will have accommodations for upwards of 2,000 men.

The Armory is situated about three hundred yards south of the Administration building. It is one of the largest of its kind in the United States and is built of concrete and steel, 126 x 355 feet. The drill hall portion has an unobstructed area of 36,000 square feet. The arms room, offices, and drill hall afford facilities for the accommodation of 1,000 men.

The New Heating Plant, located at the south end of the Armory, is a one-story reinforced concrete building, with a concrete tunnel and conduits leading to the various buildings on the south side of the campus. It contains three boilers, one two-hundred-ninety, one two-hundred-fifty, and one one-hundred-fifty-five horsepower, with the necessary equipment for heating the buildings connected with it.

The Power Plant, a one-story brick building in the rear of Mechanical Hall, contains the requisite equipment for supplying the various buildings with heat, light, and power. The apparatus installed in this building serves the purpose also of demonstration equipment in these special lines.

Waldo Hall, one of the two halls of residence for women, occupies a commanding site one hundred and fifty yards west of the Armory. It is a large building of striking appearance, with a cement foundation and basement wall, and a cream-colored, pressed-brick superstructure, three stories high. The dimensions are 96 x 240 feet; and it contains one hundred and twenty-five rooms for students, besides a kitchen, dining room, and parlors. It is modern in all its appointments and finished throughout in natural grain Douglas fir, stained to conform to the color scheme.

Cauthorn Hall, the second of the women's halls of residence, is a well-proportioned frame building, situated on a commanding spot in the western part of the campus. It is 160 x 50 feet, has three stories and basement, and contains sixty-two rooms, besides a large kitchen, dining room, and reception rooms. Its furnishings and appointments are adequate, modern, and in harmony with its

use. Each floor is supplied with hot and cold water, baths, electric light, and steam heat.

Shepard Hall, the student building under the auspices of the Y. M. and Y. W. C. A., was completed at a cost of something over \$22,000. This building contains in the basement a swimming pool, shower baths, lockers, banquet room, kitchen, wood room, and accessories. The first floor contains a large lobby which is used for a reading room, game room for social events, and general assembly. It also contains offices for the General Secretaries, a public office, a cabinet and check room combined, and a room for the Y. W. C. A. The second floor contains six rooms for the use of the literary and dramatic societies, the Cosmopolitan Club, and the staff of the Oregon Countryman. The building, known as Shepard Hall, is a fitting tribute to the memory of Clay Shepard, who gave his life to the cause of cleaner, higher, and truer citizenship as exemplified in student life.

Horticultural Products Building. The building is of brick, 72x46 feet in dimensions, with full basement and two additional floors. It will be provided with steam, hot and cold water, and electricity for both lighting and power. On the first floor will be a large evaporation room in which will be found a prune tunnel drier consisting of three tunnels twenty-two feet long. Here also, will be found a kiln drier to be used especially for such fruits as apples. Accommodations are also being planned for special forcedraft evaporators. Adjoining the evaporation room will be a receiving room, which can be utilized for processing, or for jam and jelly making. This floor will also contain an evaporation room for the manufacture of juice, vinegar, and similar products.

On the second floor will be a large canning room 72 feet long, which will be equipped for the canning of fruits and vegetables; a room for experimenting with special fruit products, such as glace' fruits, maraschinos, etc. On this floor will also be set aside a room for young women in Domestic Science where they will work out the food value of the various products which the Horticultural division is able to prepare.

In the basement of this building will be excellent storage facilities for canned goods, vinegars, etc. The building will be equipped with an elevator. The inside walls will be of brick with enamel coating, and the floors will be waterproof, so that the entire building can be flushed out.

Farm Buildings. The College Farm is now well equipped with farm buildings, and modern facilities for conducting practical and scientific work in animal husbandry.

The Dairy Barn is commodious, modern, and attractive in design. It is a frame building, with cement foundation and brick pilasters. The main part is 50 x 100 feet, two stories high, with two wings extending to the south, each 46 x 80 feet, one story in height. There is also a milk room, an engine room, and a fuel room. The building is utilized as a general barn, and will accommodate nine horses and seventy cattle, with sufficient space for the storage of feed. On the first floor of the main portion are located the horse stalls, bins for storing the various grains and mill feeds, a seed room, and space for vehicles. The concrete basement is of sufficient dimensions to permit the storing of about one hundred tons of roots. The second floor has a storage capacity for one hundred tons of loose hay. A prominent feature of the barn is the cow stable. This is strictly modern, well lighted and ventilated, with concrete floor, thirty individual, tubular-iron adjustable stalls, and three commodious box stalls. The aisles are wide, and thus not only furnish an abundance of air space for the animals, but also afford visitors an excellent opportunity to view the stock. The milk and engine rooms are conveniently situated, but sufficiently isolated for proper sanitation. This building is lighted by electricity, well supplied with water, thoroughly sewered, and furnished with an elaborate system of bell traps. Adjoining this stable is a stave silo, built several years ago, and a new concrete silo, completed in 1914, for use of the Dairy Husbandry department.

The old barns were moved and remodeled so as to harmonize with the new structure. They contain rooms for housing machinery and tools.

The New Cattle Barn. The department of Animal Husbandry is fortunate in having been able to erect a modern beef-cattle and sheep barn. It is located just west of the old barns, and has a floor space of 52 x 120 feet for sheltering stock. The hayloft has a storage capacity for 300 tons of hay and straw. Adjoining the barn are several concrete-floored exercise lots and a new stave silo. Especial conveniences are provided for the feeding, watering, weighing, and handling of live stock. The west half of the barn is at present devoted to beef cattle and the east half to

sheep, although it is planned that the entire barn will eventually be used for beef cattle.

The Stock Judging Pavilion. The Animal Husbandry work of the College is greatly facilitated by a judging pavilion, which provides very comfortable and commodious quarters for all of the demonstration work with live stock. The main room is 40 x 90 feet, well lighted, and provided with heat. A movable partition is provided whereby this large room may be divided into two smaller ones, each large enough for all ordinary purposes. The live-stock work in the past has been very much handicapped by crowded quarters without heat or good light, but these difficulties are now past and the department is in a position to do much better work than before.

The Veterinary Building, a frame structure 56 x 65½ feet, is to be used for both instructional and Experiment Station work. The front part of the building consists of two rooms, amply lighted by sky lights and large windows. One of these is an amphitheater, with a seating capacity of about 120. This will be used very largely for clinic. The arena is sufficiently large for casting animals for surgical work. The opposite room is to be used for dissection and for holding autopsies. It is equipped with an overhead track for suspending carcasses, and is large enough to accommodate five dissection subjects at one time.

The back part of the building is divided into two stories. The first floor consists of a dressing room, toilet and shower-bath room, drug and instrument room, and stalls. There are three box stalls, two of which can be thrown together for use as a maternity stall. There are three tie stalls. The stalls will be used for both clinical and experimental animals. The second floor has ample capacity for storing feed, and for housing guinea pigs and rabbits.

There are two exercising paddocks just behind the building. The paddock fences have a baseboard which extends about 3 inches below the surface of the ground. The fences are doubled, with the necessary space between them to render the paddocks safe as quarantine pens.

Farm Mechanics Building. A modern building has recently been completed for the Farm Mechanics work. It is an attractive, well-lighted brick building, having a large operating floor, a class room, locker room, shop, and tool room on the first floor. This operating floor is of cement and is roomy enough for demonstra-

tion and for the operation of the heavier farm machines. Within this place is reserved space for the very heavy farm tractors. A gallery surrounds this operating floor and provides space for the lighter farm implements such as tillage, haying, and harvesting machines.

The building is equipped with shafting, belting, and power for the operating and testing of the various machines, and a large well is provided for making pump tests. A very complete equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest; so that the student has constantly before him and is working with and studying the very best classes of farm machinery of all types.

Representative machines are found in the laboratory as follows: plows, harrows, pulverizers, cultivators, plant-setting machines, corn planters, potato planters, grain and grass seeders, mowers, rakes, binders, sprayers, manure spreaders, potato diggers, wagons, etc. Among the power machines are stationary gasoline engines, various types of pumps and pressure water systems, feed grinders, gasoline tractors, steam tractors, gang plows, farm lighting plants, and complete threshing machines. All of this expensive equipment is available to students in Farm Mechanics in the regular and short-course work.

The Poultry Houses. On a five-acre tract of land, lying south and west of Cauthorn Hall, there have been erected several buildings especially planned for the needs of the department of Poultry Husbandry. The main poultry building is a three-story structure and is used principally for class, laboratory, and demonstration purposes. It contains a demonstrating room with desks and other necessary equipment; a shop, with the necessary tools, benches, and equipment for practice work in building poultry-plant equipment; storage rooms, office, and wash rooms are also provided. In the basement, rooms are provided for fattening and killing fowls, an incubator room for student use, and a feed room with the necessary machinery for grinding and mixing poultry feeds. Besides the main poultry building there is an incubator house, with a capacity of twenty-four incubators and complementary apparatus; and a feed-storage building and a brooding house. There are also colony houses for laying and breeding stock and growing chicks. The colony houses are movable and constructed upon a plan that could be adopted by any farmer. The colony brooding coops are also

portable, and are used for investigations in both natural and artificial brooding.

Hog Barn and Feeding House. During the fall of 1916 the Animal Husbandry department secured its long-needed hog barn and feeding house. The barn is designed especially for farrowing and contains twenty-nine pens, with a four-foot alley running the length of the building from east to west. Concrete is used for the entire floor, the feeding troughs, and the automatic watering equipment. The feed house is twenty-eight by forty feet in dimensions, three stories high. The ground floor is occupied by a driveway and entrance alley, root bin, two large grain bins, which extend through the second story, and a hopper for dumping grain into the elevator, which leads to the third floor. It provides also equipment for dividing, weighing, and loading pigs, as well as a small boiler for heating water. The second story provides room for the storage of straw, six smaller grain bins with hopper bottoms, and sleeping quarters for the herdsman. The third floor contains the grinder, motor, chutes to grain bins, and storage room for movable equipment. The total capacity of the building is 15 tons of roots, 6308 bushels of grain and 40 tons of straw.

COLLEGE ORGANIZATIONS

One of the most important factors in rounding out the results and benefits of a college course is the society, club, or association work. As a result of the diverse interests of college life and the varied tastes of the students, the following organizations, besides many others, are maintained by students and faculty:

The Student Body Assembly. This is an organization of the entire student body working under a constitution and by-laws approved by the faculty and having general authority over all student body enterprises. Student body officers are elected annually. Nominations and elections are conducted in a manner similar to that of the state electorate. The officers consist of a president and secretary chosen from the Senior class, and three vice-presidents chosen one each from Senior, Junior, and Sophomore classes. These officers, as a whole, constitute the executive committee of the student body and have general supervision of all affairs of interest to the student body.

The Board of Control. The Board of Control consists of three faculty members appointed by the President of the College, one

alumnus chosen by the Alumni Association, and five students who are the executive committee of the student body. The student body constitution vests in this Board of Control authority to supervise all student body interests entailing the expenditure of student body funds. They exercise functions in the main by the approval of budgets and schedules. The immediate supervision is exercised through a general manager appointed by the Board of Control.

Student Self Government. A system of student self government has been established at the College which places the general disciplinary powers of the Institution in the hands of the students. The Student Council, an organization made up of ten students, five of whom are Seniors, three Juniors, and two Sophomores, has been created and vested with such powers as are necessary to enforce the rules and regulations adopted by the students. Three members of the Student Council hold that position by virtue of their office as president of each of the classes. The remaining members are elected annually by popular vote of the student body.

The Literary Societies. These organizations have the common purpose of promoting literary work among the students. The weekly literary programs and occasional joint meetings tend to this end. The Shakopean is essentially an honorary society, membership depending upon honors won in debate or oratory at the College. To stimulate interest in debate and oratory, there are held during the year intersociety, intercollegiate, and interstate contests. Gold medals and cash prizes are presented to the winners in the contests, and the successful society in debate receives the "Gatch Cup." This is the silver cup that was presented in 1901 by Dr. Thomas M. Gatch, then president of the College, to the society that had received highest honors in the season's debates. Annually this cup is to go to the successful society in debates, but it is ultimately to become the property of the society winning it three years in succession. Many and determined have been the battles for its possession, but the cup is still without a permanent home.

The Christian Associations. The Young Men's Christian Association was organized in the Oregon Agricultural College as a part of the International Brotherhood in 1890. Since that time it has grown until it includes in its membership about one-fourth the men in the Student Body. The erection by the Y. M. C. A. of Shepard Hall, the student community building, which contains a swimming pool, reading, social, and game rooms, has greatly

increased the scope and added to the effectiveness of the work. The Association aims to provide a high moral atmosphere and pleasant social advantages for its members and their fellow students. Members are trained in executive and committee service in work for their fellows and the community. Meetings are held in Shepard Hall each Tuesday evening; Bible, Mission, and social-study classes are regularly conducted; visitation committees call on students who are ill or disheartened; school boys of Corvallis are organized into clubs and Boy Scout patrols; regular socials are held in conjunction with the Women's Association; and extension work is conducted in vicinities near Corvallis. On registration days, committees are on hand to assist students in securing comfortable quarters in good homes and in adjusting their work satisfactorily. Those who make their way through College will find the employment bureau of the Association always ready and glad to assist them as far as possible in securing positions.

The Y. W. C. A. aims to cooperate with all the forces of the College in promoting among the women students a well-developed life. The rooms of the organization are located in Shepard Hall, the student community building. On registration days committees are appointed to meet incoming students and to help them in adjusting their work. Those who wish to earn their way through College will find the employment department ready and glad to assist them as far as possible in procuring positions. Weekly meetings are held in Shepard Hall on Thursday, and there is a Sunday Vesper service to which all women are welcome. Bible and Mission Study classes, social service work, socials and teas, all tend to make up the program for the year's work. Three-fourths of the women in College are members of the Y. W. C. A. and more than that number are enrolled in voluntary Bible Study.

The Athletic Association. This organization, maintained by the students through the student body assembly, encourages wholesome competition in the various outdoor and indoor intercollegiate sports. It has charge of all details pertaining to the conduct of intercollegiate athletics in which the College may be interested. A committee of the faculty has general supervision over the whole subject of athletics, thus assisting to insure a sound and conservative management.

The Varsity O Association. This association, which succeeds the Orange O Club, includes all men of the College who have been

officially awarded the Orange O in recognition of service on the intercollegiate athletic teams of the College. Its function is to promote the athletic ideals of the College and to serve in an advisory capacity to the Athletic Board of Control.

College Folk Club. This club was organized in October, 1908. Membership is open to all women of the faculty and other women employees of the institution, and to the women members of the immediate families of the faculty and other employees. The object of the club is social diversion, general culture, and the promotion of the best interests of the College and the community. The organization at this time is divided into three sections: Sociology Section, Mothers' Section, and Dramatic Section. Aside from the semi-monthly meetings of the various sections, the general club convenes on the first Saturday of each month, at which time an address is given by an outside speaker, or a musical or literary program is furnished by members of the club. In January, 1913, the organization became affiliated with the Oregon State Federation of Women's Clubs. It is the purpose so to extend the work of the club as to effect the greatest possible good to the College and to the city.

The Mask and Dagger. This club was organized for the purpose of offering special training in dramatic art. A semi-annual "try-out" is held in which all students of the institution may participate, and any who possess talent in this direction may be elected to membership in the club. No student, however, will be permitted to take part in a public production who has not an average for all of his College work, at the time the play is being prepared, of 75 percent. Platform exhibitions will be given and standard plays presented during the College year.

The Oratorical Association. This body has immediate charge of all business pertaining to the competitive work in oratory and debate. Schedules, dates, prizes, conditions of competition, and all similar matters are in its care.

Intercollegiate Debate and Oratory. Each year the Oregon Agricultural College has three intercollegiate debates, putting into the field six teams, three supporting the negative and the others the affirmative of the same question. The College sends one representative each year into the old-line State Oratorical Contest in which eight colleges take part. Gold medals are awarded to the

men who represent the College in these events. Each year also the College sends a representative to the State Peace Oratorical Contest, where two prizes of \$75.00 and \$50.00 respectively are awarded for first and second place.

Local Debate and Oratory. A local peace oratorical contest is held annually, to the winner of which the Cosmopolitan Club of the College presents a cash prize of ten dollars. There are also interclass contests in Declamation, Debate, Oratory, and Extempore Speaking, prizes being awarded by the Oratorical Association to the winners of these events. These latter contests are forensic events in the annual Interclass Forensic-Athletic Championship Contest, wherein the four classes compete for individual prizes and three loving cups — the Shakopean Cup, which becomes the permanent property of the highest individual forensic point-winner of the class winning the championship; the Orange O Cup, which becomes the property of the best athlete in that class; and the Barometer Cup, which is held one year by the class winning the interclass championship.

The Sphinx. This is the senior honor society. Membership is acquired by election based on prominence in student activities and excellence in scholarship.

The Forum. This society was organized by the junior and senior classes in the spring of 1914, its primary purpose being to recognize efficiency in scholarship among junior and senior students. Election is made to the society by its own members. The fact that high standards of general excellence have been set by charter members makes it a decided honor to any student to be elected to membership.

The Cosmopolitan Club. This is an organization of foreign and American students. It is a local chapter of the Association of Cosmopolitan Clubs of the World. Its purpose is to provide social and educational advantages for its members and to promote international friendship. At present, eleven nations are represented in the local chapter.

The Agricultural Club. This club was established for the purpose of advancing interest in the various phases of agriculture, and promoting the investigation and discussion of both general and special agricultural subjects. Suitable programs are

prepared for each meeting, and whenever practicable, leading authorities on practical agriculture are engaged to address the members.

The Lewelling Club. This is the Horticultural Club conducted under the auspices of the Horticultural department. There is no regular organization, except an executive committee, which has power to transact such business as requires action on the part of the club. It is open to all students interested in horticulture.

The Withycombe Club. Membership in this club is open to all students taking Animal Husbandry work. The meetings of the club are devoted to discussion of Animal Husbandry topics not ordinarily covered in formal class-room instruction.

Gamma Sigma Delta. There is established at the College a local chapter of this national honorary agricultural fraternity. The aim of the society is to advance the study of agricultural subjects by giving honorable recognition to students taking the lead in this work. Elections to membership are made from the senior class by the members of the local chapter.

The Forest Club. This is an association of students and instructors "formed for the purpose of promoting the forestry interests of the State." In order to carry out its purposes, it meets twice each month. The first meeting of each month is purely of a social nature, with each alternate meeting for the discussion of current forestry literature, magazine articles, news items, legislation, and general progress movements pertaining to forests, forest service, forest products, forest industries, lumbering, and the lumber trade.

The Civil Engineering Club. This is an organization within the departments of Civil and Highway Engineering. The active membership is drawn from the junior and senior classes, and the privilege of associate membership is extended to the members of the two lower classes. It meets weekly for the discussion of subjects of interest to the civil and highway engineer.

The Electrical Engineers. This is a College branch of the American Institute of Electrical Engineers. The aim of the organization is to discuss the topics contained in the monthly proceedings of the A. I. E. E., and in this way develop in the student an intimate knowledge of the activities of the national organization,

thereby coming into closer touch with the practical problems in the engineering world and becoming better fitted for their life work.

The Miners' Association. This body has for its object the discussion of technical engineering subjects; the review of current mining literature; the presentation of original papers by the active members; and occasional lectures on special mining topics by men outside of the College.

Mechanical Engineers. This is a College branch of the American Society of Mechanical Engineers. The purpose of the organization is to meet at regular intervals for presentation of technical papers by members and by practicing engineers. Current topics of interest to engineers are also discussed at these meetings and an effort is made to keep in touch with the practical problems of the engineering world.

Sigma Tau. This is a local chapter of the national honorary engineering fraternity, chapters of which exist at nearly all of the recognized technical schools of the United States. Membership in the fraternity is restricted to junior and senior students in Engineering and Forestry, election to membership being based principally upon excellence in scholarship.

The Home Economics Club. This is an organization for the purpose of bringing all the women of the School of Home Economics into closer touch with one another than is possible without a central organization. The aim of the club is to give, by a series of monthly meetings, a general survey of Home Economics questions not covered in regular class-room work. The aim is carried out by means of well-directed discussions and by securing outside lecturers who by virtue of their training and experience are considered authorities on subjects relating to Home Economics.

Theta chapter of Alpha Kappa Psi, a national fraternity devoted to the profession of Commerce, was organized during the school year of 1913-14. The purpose of the fraternity is to promote investigation along scientific lines in all phases of commercial work. Membership is open only to students in the junior and senior year in the School of Commerce; and in order to become a member, the student must have shown himself a leader both in scholarship and in student activities.

The Commercial Club. This is a student organization within the School of Commerce. The purpose of the club is to bring its members into close relation with current methods and events in the commercial world. This is accomplished by discussions of topics pertaining to commerce by members of the club, and by addresses at various times during the year by prominent men in the fields of law and business. Active membership is open to all members of the School of Commerce.

The Pharmaceutical Association. The main purpose of this organization, which consists of the pharmacy students, is to bring its members into closer relation with the current events of the pharmaceutical world. This is brought about by discussions in the meetings of topics pertaining to pharmacy, and by addresses at various times during the year by prominent pharmacists and salesmen of the State.

The Easterners' Club. Membership in the Easterners' Club is open to all students and faculty people who have at any time resided in those states situated east of the Mississippi River, or in those provinces of Canada east of Manitoba. The objects of the club are to promote the interests of the College throughout the East, to encourage prospective students from the East and to offer social diversion to its members by providing occasions for the mingling of ideas on such current events as the sports and politics, which are represented by the various states included within the membership.

The Eastern Oregon Club. This is an organization effected for the purpose of promoting the mutual interests of the College and the people of the eastern part of the State. Its members are afforded many social and intellectual advantages from the regular club meetings. Membership is open to all students from Eastern Oregon.

The California Club and The Washington Club, are, as the names imply, composed of students whose homes are in California or Washington. It is for the purpose of bringing "Californians" and "Washingtonians" together socially that the clubs meet.

The Portland Club is composed of all of the students registering at the College from Portland, the primary object of the club being social diversion among those students who have been associated in their high-school work in previous years.

COLLEGE PUBLICATIONS

Two classes of publications are issued from the College; one official, published by the College authorities; the other, unofficial, published by the various student organizations.

The College publications include:

The Catalogue. The General Catalogue, published in the spring, contains much general and specific information as to the courses of study, equipment, and instruction, and gives a list of faculty members, and of students registered up to the time of publication.

The Bulletins of the Summer School. These announcements contain specific information of expenses, courses of instruction, character of the work presented, and the requirements that prospective students must meet.

The Bulletins of the Winter School. These announcements carry such information regarding the winter courses as may fully present the advantages of these courses to the public.

Extension Bulletins. These bulletins consist of monographs on the various phases of Agriculture, Domestic Science and Art, Engineering, Mining, and Commerce, together with the bulletins and circulars issued in connection with the Industrial Club work for boys and girls in the public schools and the Home Cooperative Demonstration Projects. They are written in such style as to be easily understood, thus meeting the popular demand for scientific knowledge and giving it in such form that the people of the State may profit by its application to the problems of everyday life.

The Extension News, a monthly periodical devoted to items of timely information sent to citizens of Oregon on request.

The Station Bulletins. These publications include reports upon research problems and upon experimental investigations in agronomy, horticulture, drainage and irrigation, dairying, animal husbandry, poultry husbandry, insect pests, plant diseases, home economics, and special subjects of interest to the husbandman, conducted at the home station or the several branch stations.

STUDENT PUBLICATIONS

The student publications comprise:

The Barometer. In March, 1896, the literary societies of the College began the publication of a monthly periodical, the "O. A. C. Barometer." The enterprise has met with deserved success, and "the organ of the student body" is now issued as a four-page, six-column semi-weekly. It publishes the "news of the College," and is of general public importance as representing the interests, character, and accomplishments of the student body at the College. By action of the Board of Regents, resulting from a unanimous recommendation of the Student Body, a portion of the regular semester student fee of \$5.00 will be devoted to the "Barometer," and every student will regularly receive the paper.

The Beaver. This is the annual publication of the junior class, and made its initial appearance as "The Orange," in 1907. It is a high-class publication, substantially bound, and fully illustrated with photoengravings, pen and ink sketches, line and wash drawings. It is a full-dress carnival of the year's life, representing the dignity, the beauty, the versatility, the gaiety, the traditions, the sentiment, and the solidarity of the Oregon Agricultural College.

The Oregon Countryman. This is an illustrated monthly magazine, published by the Agricultural and Home Economics students under the supervision of the faculties of these courses. It is designed to be of special service to the farm home. Besides dealing with the work of the various College departments in a practical manner, it contains articles of scientific value contributed by the Experiment Station workers. Successful men and women of the State contribute articles for each issue.

The Student Engineer. This is a magazine devoted to engineering and mechanic arts. Its purposes are to record the engineering progress in the Northwest; to furnish news; to discuss methods relating to the mechanic arts; to publish records of scientific work done by the student in this institution; and to publish any matter of special technical and scientific interest. Items of interest will be found for civil, mining, mechanical, and electrical engineers, for foresters and others engaged in technical pursuits. The journal is under the supervision of the faculties of the Schools

of Engineering, Mining, and Forestry, but the work and responsibilities of the publication are borne by the staff, elected by the students of the school concerned.

The Commercial Print. This magazine, published each semester by the students of the School of Commerce under the supervision of the faculty of the school, is devoted to the commercial interests of the College and State. Articles of merit are contributed for each issue by students, faculty, and prominent business men of the State. One distinguishing feature of the magazine is the publication each semester of a complete directory of all the members of the institution, students, faculty, and employees.

The O. A. C. Alumnus. This is a quarterly periodical edited and issued for the Alumni Association by the Secretary of the General Alumni Association of the Oregon Agricultural College, whose office is at the College.

STUDENT EXPENSES

GENERAL FEES

Tuition is free to all students, regardless of the place of residence. The regular College fees, required of all students, with the exception of special students in music who take no other College work, are as follows:

Entrance fee, payable annually on registration.....	\$5.00
Incidental (Student) fee, payable each semester..	
Diploma fee on graduation.....	5.00
Binding fee for graduation thesis.....	1.00
Vocational certificate fee.....	1.00

LABORATORY FEES AND DEPOSITS

Students are charged small fees in the different laboratory courses to cover the cost of material used; and deposits are required to cover cost of breakage in laboratory courses where breakages are likely to occur. These fees are payable at the beginning of each semester. At the end of the semester, deduction is made for actual breakage, and the balance of the deposit is refunded to the student. The fees and deposits charged each semester in the different courses are as follows:

Animal Husbandry:	Fees	Dep.
Courses 1, 16, 15, 250, 260, A.....	.25	
Courses 2, 101, 102, B, F.....	.50	
Course D	1.00	
Course 103	4.00	

Art and Architecture:**Art**

Courses 102, 103, 204, 205, 206, 305, 306, 411, 412, 505, 506 .....	.50	
Courses 600, 601, 602, 603.....	1.00	2.00
Courses 413, 414.....	2.00	

Architecture

Courses 518, 533, 535, 536, D. A. 501, 502.....	.50	
Courses 601, 602, 604, 701, 702.....	.75	
Courses 537, 538, 603.....	1.00	

Bacteriology:

Courses 701, A.....	2.00	
Courses 103, 104, 205, 302, 304, 305, 401, 402, 501, 502	3.00	
Course 113	4.00	
Courses 112, 116.....	5.00	

Botany:

Course 37, 105 .....	.75	
Courses 24, 101, 102, 104.....	1.50	
Courses 111, 116, 118.....	2.00	
Course 50	3.00	2.00
Courses 30, 31, 41, 42, 70.....	2.25	.50
Course 71	3.00	.50
Courses 36, 52, 67, 68, 69, 73, 75.....	2.25	

Chemistry:**All Laboratory Courses**

Fees.....	One dollar per credit hour
Deposits.....	Two dollars per course

Commerce:

Courses 100, 101, 102, 103, 107, 404, 405, 410-a, 416, 417, B, C.....	1.00
Courses 400, 401, 402, 403, 410, 411, 412, 413.....	2.00

Dairy Husbandry:		Fees	Dep.
Courses 3, 4, 7, 12, A, B, C, D, F, P.....	2.00	1.00	
Courses 6, 9, H.....	1.00		
Courses 2, 10.....	.25		
Courses 14, 1.....	3.00	2.00	
Course 30	2.00		
Course 5.....	.50		
Engineering:			
Chemical			
Courses 301, 402.....	4.50	2.25	
Courses 302, 401.....	7.50	3.75	
Course 404	2.00		
Civil			
Courses 107, 111, 511.....	.50		
Courses 222, 223, 225, 232, 235, 242, 243, 252, 254, 256, 272, 274, 513, 514, 515, 516, 557, 621, 622	1.00		
Electrical			
Courses 201, 202, 203, 204, 403.....	2.50	3.00	
Experimental			
Courses 210, 238, 255, 262, 265, 272.....	2.00		
Courses 201, 202, 203, 204, 205, 206, 207, 208, 225, 231, 232, 233, 235, 241.....	3.00		
Courses 291, 292.....	Arrange		
Highway			
Course 415	1.00		
Irrigation			
Courses 204, 303, 305, 402, 501, 701, 802.....	1.00		
Entomology:			
Courses 301, 302, 303, 304, 305, 310, 311.....	1.00		
Course 316.....	2.00		
Farm Crops:			
Courses 1, 5, 9, 11, 13, 15, 19, 22, A, B, C.....	.75		
Courses 23, 24.....	Arrange		
Farm Management:			
Courses 1, 11.....	1.00		
Courses 3, 7, A, B.....	.50		

Farm Mechanics:

	Fees	Dep.
Courses 1, 9, A.....	1.50	1.00
Courses 3, 5, 13.....	2.00	1.00
Course 7	1.00	1.00
Course 15	2.00	

Forestry:

Courses C, D, E, F, 505.....	1.00
Courses 201, 202, 203, 204, 205, 206, 307, 503.....	1.50
Courses 301, 303, 304, 305, 316, 317, 318, 501, 506, 507, 508	2.00
Courses 306, 502	3.00
Courses 308, 601, 604, 605, 606.....	4.00

Horticulture:

Courses 201, 401.....	.50
Courses 103, 104, 105, 127, 128, A, B.....	1.00
Course 101-a.....	1.50
Course 115	3.00

Household Art:

Courses 100, 104, 105, 106, 203, 205, 501, R, S....	1.00
Courses 301, 701, T.....	1.50
Courses 405, 407.....	3.00

Household Science:

Courses 510, L.....	.50
Course 120	1.50
Courses 210, 515, M.....	2.00
Courses 190, 191.....	2.50
Course 100	3.00
Courses 201, 203.....	4.00
Courses 106, 107, H, I.....	6.00
Course 530	5.00 a week

Industrial Education:

Courses 165, 167.....	1.50
Courses 164, 166.....	.50

LABORATORY FEES AND DEPOSITS

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Industrial Arts:	Fees	Dep.
Courses 106, 133, 202.....	2.00	1.00
Courses 152, 153, 228.....	2.00	
Courses 110, 111, 113, 116, 131, 132, 134, 138, 203, 206, 207, 208, 209, 212, 215, G.....	4.00	1.00
Courses 151, 154, 155, 156, 158, 171, 173, 175, 270, L.....	4.00	
Courses C1, C2, C3, D1, D2, D3, E1, E2, E3, F1, F2, F3, T1, T2, T3, U1, U2, U3.....	8.00	1.00
Courses J1, J2, J3, K1, K2, K3, M1, M2, M3, N1, N2, N3, P1, P2, P3, Q1, Q2, Q3.....	8.00	
Courses 103, 104, 135, 136, 205.....	6.00	1.00
Course 174	6.00	

Mining:

Courses 135, 137, 161, 171.....	1.00	
Courses 111, 112.....	3.00	
Course 401		20.00
Courses 212, 323.....		2.00
Courses 301, 324, 330, 423.....		5.00

Pharmacy:

Courses 130, 131, 140, 141, K, L, M, N.....	1.00	
Courses 118, 152, 170, E, F, S.....	6.00	1.00
Courses 121, G.....	4.00	
Courses 160, 161.....	3.50	

Physical Education:

All courses	1.50
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(All students using the Gymnasium pay the fee of \$1.50 per semester, for which they are given use of all equipment, baths, and are furnished with towels, soap, and medical supplies for injuries.)

Physics:

All courses except 220.....	2.00
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Poultry Husbandry:

Courses 1, 2, 3, 4, A, B.....	1.00	1.00
Courses 6, 9.....	1.00	

Soils:	Fees	Dep.
Courses 5, 103, 105, A.....	1.00	1.00
Course C	1.00	
Courses 1, 2, 3, 7, 15, 16.....	1.00	2.00
Courses 9, 13, E, G.....	.50	
Courses 101, 107, 109, 117, 121, 123.....	.50	1.00
Veterinary Medicine:		
Courses 3, 4, 11, 14, B, C.....	.50	
Courses 2, 5, 6.....	1.00	
Course 1.....	2.00	
Zoology:		
Courses 106, 107, 120, 122.....	.25	
Courses 110, 111.....	1.00	1.00
Courses 101, 102, 108, 109, 114, 115, 116, 201, 202, 207, 208, A.....	1.50	1.00
Courses 104, 105.....	2.00	3.00
Courses 113, 205, 209.....		3.00

BOARD AND ROOM

Women's Dormitories. Waldo Hall and Cauthorn Hall, with their large airy parlors and halls, are pleasant residences for the young women who come from distant homes. The buildings are supplied throughout with pure mountain water, both hot and cold, electric lights, steam heat, and all modern conveniences. The rooms are furnished with an iron bedstead, a mattress, a chiffonier, a table, and chairs. Such other materials as are needed to make the furnishings complete, including pillows, pillow cases, sheets, blankets, bedspreads, and towels, are furnished by the student; and many of the students prefer to make the rooms more home-like by bringing rugs, curtains, pictures, sofa cushions, etc. These latter articles, however, are not at all necessary. The rooms are cheerful and comfortable without additional furniture. The bedrooms average about 12 feet by 15 feet, with one window 3 feet by 7 feet. Many of the rooms are larger, and a few of them have two windows. Most rooms are furnished with single beds, but a few double ones are available. There are a limited number of single rooms in each hall. Preference for single rooms should be indicated early. The many advantages of having a roommate should not be overlooked by the student in making her plans for college life.

The conditions of living in Waldo Hall and Cauthorn Hall are such that the College considers it a distinct advantage to the women students to live in these halls of residence. A wholesome, busy student atmosphere is maintained. Reasonable freedom is allowed, but week nights are reserved for study. All girls entering the College are expected to live in one of the dormitories, unless their parents reside in the city, or they are given special permission from the Dean of Women to live elsewhere. This permission must be obtained from the Dean of Women previous to registration.

The expenses of living for each student in the dormitories are as follows:

Room deposit	\$ 3.00
Room rent for each semester—	
Single room	20.00
Double room	10.00
Board per week, payable monthly in advance	4.00
Incidentals, such as laundry fee, electric iron fee, etc., for each semester.....	2.00

The room deposit of \$3.00 must be sent to the Registrar at the time of application for a room. When the student withdraws from College, this deposit will be refunded, upon presentation of the receipt, if no damage has been done to the room or furnishings.

Women students are not expected to arrive in Corvallis until the day the Halls are opened.

The dormitories will open for students September 22, 1918, the day preceding the first registration day.

Private Board for Men Students. No dormitory accommodations are available for men students. Board and room may be secured in private families in the city of Corvallis for from \$4.00 to \$5.50 per week. Good accommodations for self-boarding, or for club-boarding, can also be secured in the city. By clubbing, or renting rooms and boarding themselves, students materially reduce the cost of living. Students, however, will not be permitted to live at places not approved by the Faculty.

Lists of private boarding places can be secured from the Secretary of the Y. M. C. A. after the student arrives at the College.

PERSONAL EXPENSES

The personal expenses of students vary. Many students are able to go through the college year on a comparatively small income.

Questions of personal thrift, discrimination in values, and established habits are determining factors here. Each man, immediately upon registration, is required to supply himself with a military uniform, the cost of which is normally as follows: Suit and cap, \$11; leggins, 90c; hat band and breast cord, \$1.15; ornaments, 85c; gloves, 40c pair; total, \$14.30. The U. S. Government pays each cadet \$14.00 a year to provide himself with this uniform. Tan shoes (the regulation style, costing \$3.75) and a drab shirt (costing \$2.00) are appropriate elements of the uniform. The uniform is very serviceable and is more economical than civilian clothing; with reasonable care, it should serve for two or more years.

Men in physical education are expected to supply themselves with a gymnasium suit and the regulation gymnasium shoes. The cost of the gymnasium uniform complete, including shoes, need not exceed \$2.75.

In physical education women are required to provide themselves with a gymnasium suit, consisting of blouse-waist and bloomers of regulation style, and with regulation gymnasium shoes. Good second-hand uniforms of outgoing girls will be on sale for about \$4.00, while new uniforms cost \$5.00. These suits should be ordered at the gymnasium office at the time of registration.

COST OF A YEAR IN COLLEGE

One of the most perplexing questions that confronts a prospective student is what the course is going to cost him a year. The necessary cost of a year at the College will vary slightly with the particular course pursued by the student. In general, it may be said that the necessary cost per annum, exclusive of the three personal items of clothing, carfare, and amusements, averages about \$224. An estimate of this average cost for the main expense items is given below. The cost for room and board is estimated at a safe average price. The board and room items are sometimes

slightly reduced, where two students occupy the same room or where boarding clubs are economically managed.

Registration fee	\$ 5.00
Incidental (Student) fee	10.00
Laboratory fees and deposits.....	18.00
Textbooks and supplies	26.00
Board (for eight months).....	*160.00
Room rent (nine months)	36.00

In addition to the above, would be the cost to men of the military uniform and the regulation gymnasium suit, and to women of the gymnasium suit and shoes. Uniforms, however, as already indicated, should serve for more than one year. Personal expenses such as clothing, railroad fare, laundry, etc., vary greatly with the individual.

It is not recommended that any student come to the College without sufficient funds available to purchase his books and college stationery for the entire semester, pay his first month's board and room rent in advance, and pay his first semester entrance fees. For the average student, this initial outlay will be approximately \$70.00, the balance of the annual expenses being distributed about evenly throughout the remaining months of the school year.

Persons desiring more detailed information on the question of expenses for students in various departments should write to the Registrar, Corvallis, Oregon, for a bulletin on "Student Expenses."

SELF-SUPPORT

A considerable number of students manage, in one way or another, to earn the whole or a part of their expenses while attending the college. Such opportunities occur in the line of office and laboratory assistance, personal services of numerous kinds, the management of various student enterprises, agencies for laundries, etc.

The Student Employment Bureau, in charge of the Young Men's and Young Women's Christian Associations, registers without charge all students who apply for employment. It is the purpose of the Bureau to try to supply work, regular or occasional, to all who need it. In general, the demand for work on the part of students exceeds the supply that the Bureau has available;

* On account of Christmas and other vacations which most students spend at home, the cost of board is estimated for eight months only.

therefore the attention of new students who intend to earn the whole or part of their living is called to the following results of past experience.

1. The applications received during summer will be given first attention; but no student should expect to be able to secure employment by correspondence.

2. There is a constant over-supply of those wishing to do teaching and clerical work. None but those having superior qualifications and experience are likely to secure employment the first semester.

3. There is a considerable demand for efficient stenographers; also for men and especially women students who can do domestic labor of any kind; board and room rent may be earned by table service, dish washing, general housework, house cleaning, gardening, etc.

4. Students who can do any kind of domestic or manual labor well, and who have thoroughly good health, can earn their board by three hours' work a day, or board and room by four hours' work a day. But no student should come to the College without resources sufficient for the expenses of one semester. (See "Personal Expenses.") Work of any kind is much more readily secured after the student has had opportunity of becoming familiar with local conditions.

5. No student should come expecting to earn money if he can do nothing well; skill is essential, as competition is quite as severe in the College community as elsewhere.

6. Opportunities for earning money during the summer vacations can usually be counted on, the demand for forest rangers, for field workers in engineering and mining, for skilled workmen in engineering shops, factories, canneries, and hop-yards, and for horticultural, farm, and forestry laborers, being most constant.

Upon arrival at the College, new students should report for information to the Information Bureau of the Young Men's and Young Women's Christian Associations.

Women students desiring work in the Dormitories should apply early to the Housekeeper of the Women's Dormitories.

The Dean of Women will be very glad to give any information to parents and prospective students about the work of the women at the College at any time. Office, Room 107 Home Economics Building.

HEALTH SERVICE

The College Health Service, inaugurated in 1916, is a department maintained with the aim of promoting the health of all the students. This aim is sought through medical examination, through consultation during office hours, through attendance of the Medical Adviser upon those in hospital and those ill at their residences, through sanitary inspection, and through supervision in case of epidemics. The services of the department, except in so far as the welfare of the College community may require, are not imposed upon any student or group of students. They are available, however, to all students who seek them voluntarily.

The department staff comprises a regular full-time physician, the Medical Adviser, who has his headquarters at the Health Service building, and a resident graduate nurse, who is in attendance at the same building.

The Health Service is maintained by funds derived from regular student fees, twenty-five percent of such fees being devoted to this purpose. The Medical Adviser may be consulted during office hours by any student. He will give medical examinations by appointment, and medical advice and attention to those who are ill. He will be in attendance at all important athletic events on the campus to render aid in case of emergencies. He will authenticate excuses from College work because of illness.

Patients who require hospital service will be attended, on request, by the Medical Adviser, as in other cases of illness; but will be responsible for all hospital fees. Patients requiring X-ray examinations of the Health Service will be responsible also for the cost of the X-ray pictures.

STUDENT LOAN FUND

Through the liberality of friends of the Oregon Agricultural College, and through the accumulation of interest on loans, an irreducible student loan fund aggregating \$7,100.00 (March 1, 1917), has been established. The purpose, as expressed by one of the donors, is "not to induce students to attend school by providing money that can be easily obtained, but rather to aid those who have determined to secure an education and are paying the cost wholly or in part from their own earnings."

The fund consists of the following contributions:

1. One thousand dollars (\$1,000) from Hon. R. A. Booth of Eugene, restricted to students studying:

(a) Agriculture in its various phases, with a view to becoming producers from the soil.

(b) Such branches of mechanics as properly relate to agriculture.

(c) Home Economics.

2. Five hundred dollars (\$500) known as the Ashby Pierce Student Loan Fund.

3. One thousand dollars (\$1,000) from the Domestic Science Dining Room at the P. P. I. E., restricted to the use of women students.

4. Four thousand six hundred dollars (4,600), without restriction, from accumulated interest and from various College organizations, such as Folk Club, Philadelphian and Feronian Literary societies, the Barometer, the Oregon Countryman, the Cosmopolitan Club, the Faculty, the Alumni, the Christian Associations, the Winter Short Course students of 1914, the Graduating Class of 1915, Chapter A. of P. E. O., Portland, and by various individuals including Mrs. Clara H. Waldo, Portland, Hon. Thomas Kay, Salem, Hon. James Withycombe, and W. D. Wheelwright.

L. J. Simpson Scholarship Loan Fund. The College has received a gift of \$2,000 from Mr. L. J. Simpson of North Bend, Oregon, whereby five annual scholarship loans of \$100 each, continuing throughout the four years of the student's college course, will be awarded to worthy students whose needs justify the awards. The administration of the L. J. Simpson Scholarship Loan Fund is in the hands of the regular Student Loan Fund Committee, to whom applications should be made.

The J. T. Apperson Agricultural College Educational Fund. By the will of the late Hon. J. T. Apperson, Regent of the College since its foundation, a fund amounting to between twenty-five and forty thousand dollars, is to be a perpetual endowment, administered by the State Land Board of Oregon, for the assistance of worthy young men and women, "who are actual bona fide residents of the State of Oregon, and who would otherwise be unable to bear the expense of a college course at the Oregon Agricultural College." The income from this estate is to be loaned to students

at a low rate of interest. Applicants for loans must be recommended to the State Land Board by the President of the College and the State Superintendent of Public Instruction.

PRIZE FUND

The Clara H. Waldo Prize of one hundred dollars is an award annually made in the proportions of forty, thirty, twenty, and ten dollars respectively, to the woman of highest standing registered as a regular student in one of the degree courses in the senior, junior, sophomore, and freshman year. In the distribution of the prizes, the committee having charge of the awards is guided by the following points:

- (a) Proficiency in literary and scholastic attainments.
- (b) Success in student activities.
- (c) Qualities of womanhood.
- (d) Qualities of leadership.

THE FAWCETT CUP

A loving cup, the gift of Mrs. Mary E. Fawcett, Dean of Women, is awarded each year to some one of the women's organizations of the College as a prize for the particular number of the Girls' Stunt Show which, in the estimation of three judges, possesses in the highest degree the qualities of simplicity, promptness, brevity, originality, attractiveness, and finish. The entertainment is made up of individual stunts contributed by the women's organizations of the College, whose presidents elect a manager of the show. The proceeds are awarded chiefly to the Y. W. C. A., though any funds in excess of two hundred dollars annually may be diverted, by vote of the executive committee, either wholly or in part, to some other worthy enterprise that affects the interests of all the College women.

ADMISSION TO THE COLLEGE

A student who wishes to be admitted to the Oregon Agricultural College may do so in one of two ways: (1) by examination, (2) by certificate.

Students who seek admission by examination must present themselves for examination at the College on registration days, September 23 and 24.

Students who seek admission by certificate may do so in one of the following ways:

For admission to the Vocational Courses. By presenting properly certified evidence of the completion of the equivalent of an eighth-grade course of study in the public schools, and by meeting the other requirements for admission specified in the paragraph on Vocational Courses, under Entrance Requirements.

For Admission to the Degree Courses. By presenting properly certified evidence of the completion of four years of the course of study (15) units in high school, and by meeting the other requirements for admission specified in the paragraph on Degree Courses, under Entrance Requirements.

For Admission as a Special Student. By presenting properly certified evidence of suitable preparation for the studies desired, and by meeting the other requirements specified under Special Students.

For Admission as an Optional Student. By presenting properly certified evidence of meeting all the regular entrance requirements to degree courses, and by meeting the other requirements specified under Optional Students.

For Admission to Advanced Standing. By presenting properly certified evidence of the completion, in other institutions of recognized standing, of such work as is equivalent to corresponding work required in the College courses, and by meeting the other requirements specified under Advanced Standing.

For Admission to Graduate Study. By presenting properly certified evidence of graduation from this or other educational institutions of equal rank, and by meeting the other requirements for admission specified under Graduate Study.

ENTRANCE REQUIREMENTS

Vocational Courses

For admission to the vocational courses in Agriculture, Dairy-ing, Forestry, Home Economics, and Commerce, applicants must be at least 18 years of age, and in addition to having completed the eighth-grade course of study, or its equivalent, must be of good moral character. For admission to the vocational course in Mechanic Arts, applicants must be at least 16 years of age, and in addition to having completed the eighth-grade course of study, or its equivalent, must be of good moral character. Applicants who have not completed the eighth-grade course of study, but who are 21 years of age or over, and of good moral character, may

be admitted to any of these vocational courses at the discretion of the dean of the school in which the work is to be carried on. For admission to the vocational course in Pharmacy, applicants must be at least 18 years of age, and in addition to having completed two years of high-school work, or its equivalent, must be of good moral character. For a statement of the length and character of the vocational courses, see index on Courses of Study.

Degree Courses

Applicants for admission to the degree courses must be 16 years of age or over and of good moral character. The fifteen units required for entrance, distributed in the most advantageous way for admission to the various College courses in Agriculture, Home Economics, Forestry, Engineering, Mining, Industrial Arts, Commerce, and Pharmacy, are indicated in the table entitled "Prescribed Units for Admission." If the distribution of units presented by the matriculate does not correspond to that recommended, as indicated by the table, the student will be required to carry in College the courses lacking in his secondary credits, in order to make up his deficiency.

A unit, as referred to in the table, implies one high-school subject carried for five 45-minute periods a week throughout the school year.

Prescribed Units for Admission	Agriculture	Home Economics	For. & Log. Engineering	Engineering*	Commerce	Pharmacy
English	3	3	3	3	3	3
Mathematics—						
Algebra	1	1	1½	1½	1	1
Plane Geometry	1	1	1	1	1	1
Solid Geometry	0	0	0	½	0	0
Electives	10	10	9½	9**	10	10
Total units	15	15	15	15	15	15

The electives listed in the table may be selected from any of the subjects offered in the "Oregon Course of Study" for high schools.

* Includes Mining and Industrial Arts.

** It is suggested that while physics is not prescribed as an entrance requirement in Engineering, students who are preparing to enter any of the Engineering courses take a year's work in high-school physics where this work is available.

While History and Foreign Languages are not prescribed by the College as entrance requirements, students are urged to pursue these subjects in the high school. For credit involved in this work, see Advanced Standing.

To be admitted as a conditioned freshman, a student must not lack more than two of the total number of entrance units.

In English. Admission to the English courses of the freshman year is by certification from accredited secondary schools. When an applicant cannot furnish such certification, his admission to the freshman courses is conditioned on his passing an examination in essentially the following tests:

1. To test his power of written expression, he will write one or more compositions on a subject, or on subjects, suggested by his personal, school, community, or literary interests.

2. To test his power of oral expression, he will read at sight, in the presence of the Examiner, passages of prose, or of poetry, or both, with accuracy and effectiveness. He will also be expected to talk intelligently in good English, on some assigned subject adapted to his ability.

3. To test the range and character of his reading, and his power of appreciation, he will be expected to answer a number of simple questions on standard classics and contemporary literature not previously prescribed. He will also be expected to explain the meaning of several passages of prose and of poetry of moderate difficulty, selected from books not previously prescribed.

Whether the applicant be admitted by certification or by examination, the English department will, whenever it deems such a course advisable, deal with the student as in a probationary relation.

In case the work of such student should, at the expiration of thirty days after matriculation, fail to conform to the standard set for creditable freshman work, he may be required to make up his deficiencies in English.

Candidates presenting exercise books containing compositions or other written work properly certified to by the instructor, will be given credit for such work.

In Mathematics. The entrance requirements in Mathematics for students entering any of the degree courses in College; namely, one unit in Algebra and one unit in Plane Geometry, will be satisfied by the applicant's ability to pass a satisfactory examination in the following topics:

(a) In Algebra, addition, subtraction, multiplication, and division of positive and negative numbers; use of parentheses, factoring, highest common factor, lowest common multiple, fractions, fractional and literal equations, simultaneous equations, problems involving linear equations with one or more unknown numbers, graphical representation of simultaneous linear and quadratic equations, involution, evolution, theory of exponents, radical expressions.

(b) In Plane Geometry, the five books of Wentworth's Plane Geometry, or any other standard text on the subject. That the student may be trained to think for himself and not be dependent upon the published proofs of the text, much importance is based upon the proving of original exercises. It is distinctly advised that students preparing for entrance examination in Geometry devote considerable time to the study of original exercises.

The entrance requirements in Mathematics for students in the schools of Forestry, Engineering, and Mining demand an additional semester's work in Algebra, including quadratic equations, problems involving quadratic equations with one unknown number, equations in the quadratic form, factoring of quadratic equations, solution of quadratic equations by factoring, simultaneous quadratic equations, problems involving simultaneous quadratic equations with two unknown numbers.

The entrance requirements in the School of Engineering demand also, in addition to the specifications above, one semester's work in Solid Geometry, such as that presented in Wentworth's Solid Geometry, or any standard text on the subject.

ACCREDITED SCHOOLS

Students who have completed four years of high-school work in a high school recognized as standard will be admitted to the degree courses on presentation of a signed statement of the principal, showing work completed. It is recommended that the Certificate of Record blank issued by the Oregon Agricultural College be used. Copies will be sent by the Registrar on the application of either student or principal. These blanks must be filled out and signed by the principal or other authorized official of the school. The certificate, so authenticated, should be filed with the Registrar of the College on or before September 18, 1918. Certificates will not be rejected at a later date but acknowledg-

ment of the receipt of such certificate will be made by the Registrar up to and including September 18 only. Students sending certificates at a later date will likely be delayed in completing registration.

SPECIAL STUDENTS

Students who have presented satisfactory evidence of suitable preparation for the studies they desire, who are 18 years of age, and of good moral character, may be admitted as special students, provided they have never applied for admission and been rejected.

Special students may be allowed to graduate in any of the courses, on condition that they complete the required work.

Special students are expected to select their studies from courses open to freshmen. If they desire to take studies to which only advanced students are regularly admitted, they must show some special preparation or special necessity for such courses.

Candidates applying for admission on the above basis should file with the Registrar before September 18, 1918, a detailed statement of their preparatory work.

OPTIONAL STUDENTS

Students who have presented satisfactory evidence of meeting all the entrance requirements for the freshman class, who are of mature years and of good moral character, may be admitted as optional students, provided they furnish satisfactory evidence that they are unable, because of poor health, or outside business, or professional duties, to take a full course. They should file with the Registrar, before September 18, 1918, a certified statement of all preparatory work.

ADVANCED STANDING

Students matriculating in the degree courses with more than the number of credits required for entrance to the freshman class, will be given advanced standing for such credits as represent work beyond the full four years high-school course, that is, work taken in the graduate year, and are equivalent to the requirements of the course in which the student matriculates.

No credit will be allowed for any Science or Foreign Language carried for less than one full year.

ADMISSION FROM OTHER COLLEGES

Any student who has attended another college or university and desires to enter the Oregon Agricultural College, should file with the Registrar, on or before September 18, 1918, an official certificate from the college from which he wishes to transfer, giving evidence of: (1) his honorable dismissal; (2) a detailed statement of the entrance credits presented at the time of his matriculation at the other college; (3) a detailed statement of the work pursued while in attendance at that college; and (4) a marked copy of the catalogue of the institution, showing by conspicuous markings the courses which he completed.

REGISTRATION

All candidates for admission should file with the Registrar a certificate of their preparatory record on or before September 18, 1918. Certificates of preparatory work will not be rejected at a later date, but applicants cannot expect to receive formal acknowledgment of their receipt by the Registrar. Applicants sending in their certificates late may be delayed at registration time. Blank forms for such records may be secured from the Registrar. Such candidates should present themselves for registration at the College on September 23 or 24, 1918. Registration at a later date will be permitted only on presentation of a satisfactory reason for the delay.

Students who have not before registered at the College are advised to reach Corvallis not later than September 21, 1917, in order that they may secure a boarding and rooming place before the first day of registration.

GRADUATION

The degree of Bachelor of Science in Agriculture, in Forestry, in Logging Engineering, in Home Economics, in Electrical Engineering, in Irrigation Engineering, in Highway Engineering, in Mechanical Engineering, in Mining Engineering, in Ceramic Engineering, in Chemical Engineering, in Commerce, in Pharmacy, and in Industrial Arts, is conferred upon those who have satisfactorily completed the respective four-years courses which in the aggregate comprise 136 credits of College work. A graduate in any of the courses receives the bachelor's degree in any other course by completing the studies required in that course.

The degree of Graduate in Pharmacy is granted to those students in Pharmacy who complete specified work meeting the requirements of the American Conference of Pharmaceutical Faculties.

A certificate will be granted those students who complete the Vocational Course in Agriculture, Dairying, Home Economics, Mechanic Arts, Commerce, or Pharmacy.

GRADUATE STUDY

The Oregon Agricultural College offers to its graduates and to those of other institutions of equal rank, work in Agriculture, Home Economics, and Pharmacy leading to the degree of Master of Science, and work in Engineering, Mining, and Forestry, leading to the usual professional degrees.

This work is done in the several departments of the College under the general supervision of a standing committee of the Faculty known as the committee on "Graduate Students and Advanced Degrees."

REQUIREMENTS FOR THE HIGHER DEGREES

Candidates for any one of the higher degrees will be required to complete a certain minimum of resident work, to prepare a suitable thesis, and to pass an oral examination.

The resident work is planned so that it may be completed in a single year by a student who devotes full time to his studies; it consists of a minimum of 32 credits, including the preparation of the thesis. Graduate credit from other institutions will not be accepted as reducing this minimum of 32 credits. One credit requires approximately three hours of the student's time each week for one semester. From 16 to 24 of these credits will be devoted to the thesis and to allied subjects in the same department, and will constitute the candidate's major. From 8 to 16 of these 32 credits will be selected from other departments of the College and will constitute the minor. Undergraduate work may, at the discretion of the committee, be taken as part of the minor, but when so taken, the number of credits allowed for any course will be reduced to two-thirds of the number listed in the catalogue, the assumption being that the candidate can, in work of that grade, accomplish as much in two hours as the average undergraduate in three. No course which is contained in the curriculum of any high school of the State of Oregon, nor any course regularly covered

in the Freshman and Sophomore years of this College shall be allowed as credit toward an advanced degree; and no credit shall be allowed toward the major for any regular undergraduate course. All graduate students taking regularly announced courses must attend the examinations given as part of such courses.

The thesis must embody the results of investigative, though not necessarily original, research, and a typewritten copy of the thesis, prepared according to the specifications of the committee, must be deposited with the chairman of the committee not later than two weeks prior to the date set for commencement of the year in which the degree is desired.

After the thesis has been deposited, the chairman will appoint a special examining committee and set a date for the oral examination. This special committee will consist of: (1) the one or more professors in charge of the major; (2) the one or more professors in charge of the minor; and (3) one or more members of the Committee on Graduate Students and Advanced Degrees. The report of this committee will be presented to the College Council by the chairman of the Committee on Graduate Students and Advanced Degrees. The chairman will deposit the thesis of successful students with the Librarian as soon as possible after the oral examination.

Higher degrees will be conferred only at the regular commencement exercises, but the committee may under exceptional circumstances allow the candidate to be absent from such exercises.

ADMISSION TO THE COLLEGE AS A GRADUATE STUDENT

All students who have been graduated from four-years courses in the Oregon Agricultural College or in other colleges of equal rank, will be considered graduate students and will be registered as such by the Registrar. Graduate students will be required to present credentials to the Registrar as specified under "Admission from Other Colleges."

FEES

Graduate students will pay the same entrance, incidental, diploma, and binding fees as undergraduates. Laboratory fees will in each case be determined by the head of the department concerned, and must be paid at the beginning of the semester in which the laboratory work is done.

SCHOOLS AND DEPARTMENTS

SCHOOL OF AGRICULTURE

ARTHUR BURTON CORDLEY, Dean

The School of Agriculture offers the following courses of study: a four-years course with various options, which leads to the degree of Bachelor of Science; one-year vocational courses in General Agriculture, Horticulture, and Dairy Manufacturing; and a six-weeks Winter Short Course.

The Degree Courses. The various degree courses in Agriculture are open only to those who have completed the equivalent of four years of the Oregon State high-school course (see Admission to the College). The aim of these courses is to train young men to become successful farmers, stockmen, and fruit growers; to equip them to become efficient managers of orchard and ranch properties and of agricultural cooperative organizations; to prepare them to become specialists in some branch of agricultural college or experiment station work, or to fit them to become teachers of agriculture in the public schools. In short, they offer to those who have faith in the farm and in rural life, opportunities for individual development and technical training equal to those provided for the educated in other professions.

The various subjects of instruction may be conveniently arranged into three groups, as follows:

(a) **Sciences related to Agriculture:** Botany, Zoology, and Entomology, Chemistry, Physics, and Bacteriology; (b) **Technical Agricultural subjects:** Farm Crops, Farm Management, Farm Mechanics, Rural Architecture, Animal Husbandry, Dairy Husbandry, Horticulture, Poultry Husbandry, Soils, Irrigation and Drainage, Veterinary Medicine; (c) **Non-technical subjects:** The English Language and Literature, Modern Languages, Political Science, Rural Economics, Rural Sociology, and similar subjects.

The subjects of the first group are designed to furnish the student with an insight into the principles of agricultural science. Those of the second group teach him the application of these principles and give him also, both theoretically and practically, various subjects of agricultural technology. The subjects of the third group tend further to develop the student's intellect, broaden his view, and train him in good citizenship.

To indicate briefly the nature of the work, it may be stated that the student studies the origin, structure, fertility, cultivation, and improvement of various soils; the history, growth, culture, improvement, and value of the different field crops; the structures, machinery, drainage, and irrigation of the farm; and the history, economics, methods, and business principles in farm management. Thorough courses in Business Administration, Rural Economics and Sociology, and Political Science for Agricultural students, are given by the School of Commerce. In the course in Animal Husbandry, consideration is given to the history and characteristics of the various breeds of live stock; the principles of breeding; the principles and practice of feeding, with particular reference to conditions in this State. By constant practice in stock judging, the student is made familiar with the good points of the various breeds. In Horticulture the student studies the problems of the orchard and garden, such as choice of sites, soils, planting, pruning, choice of varieties, sprays and spraying, and thinning; he obtains instruction and practice in the propagation of plants by various methods; in the harvesting, picking, storage, and marketing of fruits; he may study the principles of plant breeding, or the construction and management of greenhouses, or the culture of small fruits and vegetables for market or canning purposes. In Dairy Husbandry he studies the secretion, composition, and separation of milk and cream; and obtains abundant practice in the use of the Babcock and other tests, in butter and cheese making, and in creamery practice. A department of Poultry Husbandry offers to students exceptional opportunities to specialize in this line. The instruction will include a study of breeds, the principles of feeding, housing, and incubation, and will be supplemented by practical work on the farm. In Veterinary Medicine the student is taught to prevent disease, diagnose existing pathological conditions, arrest outbreaks of contagious and infectious diseases among domestic animals, give medical attention in emergency cases, and take care of the sick.

In response to the demand for special teachers of Agriculture in the high schools, an opportunity is given students to major in agricultural education. Certain courses are prescribed in the junior and senior years to broaden the general agricultural training of the first two years, so that the teacher may be prepared to meet the conditions in any section of the State. Courses in Pedagogy provide the necessary principles and methods of teaching

Some election is also allowed in order that the student may specialize along the lines of his greatest interest.

Candidates for the degree of Bachelor of Science in Agriculture will pursue one of the two prescribed courses during the first two years.

Group I (See page 79) prescribes the more work in technical Agricultural subjects and leads to the more advanced work in the departments of Animal Husbandry, Dairy Husbandry, Farm Crops, Farm Management, Farm Mechanics, Horticulture, Poultry Husbandry, Soils, and Rural Architecture.

Group II (See page 80) prescribes the more work in Modern Languages and science and prescribes especially for the more advanced work in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology.

During the two remaining years of his course, each student is given the opportunity to specialize by electing major work in some one department. For graduation, sixty-six credits are required in addition to the freshman and sophomore work. Junior and senior courses other than those prescribed must be selected with the approval of the head of the department in which the major is taken.

Students who prefer not to specialize, may, with the approval of the Dean, pursue a course in General Agriculture with a wide range of electives. Junior and senior courses aggregating not less than twenty-four credits are required in the School of Agriculture. The remaining courses may be taken in any of the schools or departments of the College.

Practical Experience Required for Graduation

Those students majoring in applied Agriculture will be required to have had a certain amount of practical experience, either before entering the institution or during vacation periods, before being granted a degree. The amount of practice work necessary will be determined in each case by the head of the department in which the student is majoring.

DEGREE COURSES IN AGRICULTURE

Group I.

Freshman Year	Semester	
	1st	2nd
*Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 100, 101).....	3	3
General Physics (Phys. 1).....	3	or 3
Agricultural Botany (Bot. 41, 42).....	3	3
Crop Production (Farm Crops 1).....	3	or 3
Stock Judging (A. H. 1).....	2	
Farm Accounts and Business Methods (Com. 109).....	2	
Live-Stock Management (A. H. 2).....		3
Library Practice (Libr. 1).....		$\frac{1}{2}$
Hygiene (Phys. Ed. 10).....		$\frac{1}{2}$
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Sophomore Year

Principles of Economic Zoology (Zool. 108, 109).....	3	3
Agricultural Chemistry (Chem. 500, 501)	3	3
General Bacteriology (Bact. 103).....	3	
Principles of Fruit Growing (Hort. 101-a).....	2	
Fundamentals of Lan. Gard. (Hort. 101-b).....	1	
Vegetable Growing (Hort. 201).....		2
Soils 1, 2.....	3	3
General Farm Mechanics (Farm Mech. 1) or.....	2	
Drainage and Irrigation (Soils 101).....(2)		
Elements of Dairying (D. H. 1).....		3
Practical Poultry Keeping (P. H. 6).....		2
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 18 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

* Students proficient in English may elect a modern language or more advanced course in English in lieu of Modern English Prose.

	Semester	
	1st	2nd
Junior Year		
*Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Ins. 1, 2).....	1	1
Electives	12	15
	—	—
	17	17
Senior Year		
*National Government (Com. 320).....	3	
*State and Municipal Government (Com. 322).....		3
Electives	13	13
	—	—
	16	16

DEGREE COURSES IN AGRICULTURE

Group II.

Freshman Year

Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 100, 101).....	3	3
General Physics (Phys. 1, 2).....	3	3
Principles of Economic Zoology (Zool. 108, 109).....	3	3
Modern Language (German, French, first year).....	3	3
Library Practice (Libr. 1).....		½
Hygiene (Phys. Ed. 10).....		½
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	½	½
	—	—
	16½	17½

Sophomore Year

Agricultural Botany (Bot. 41, 42).....	3	3
Agricultural Chemistry (Chem. 500, 501).....	3	3
General Bacteriology (Bact. 103).....	3	or 3
Modern Language (German, French, second year).....	3	3
Organic Chemistry (Chem. 201).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	½	½
Electives	5	5
	—	—
	18½	18½

* Equivalent credits from any courses in the departments of English, Industrial Education, Economics, and Sociology, or Government and Business Law may be substituted.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Ins. 1, 2).....	1	1
Electives	12	15
	17	17

Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Electives	13	13
	16	16

In the courses in this group students may major in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology. The purpose of these courses is to provide students with preliminary training for agricultural college and experiment station positions in these various sciences; for work in the scientific bureaus of the U. S. Department of Agriculture; for positions as fruit inspectors; and for technical positions in state and government fish and game propagation work.

Students who desire a less technical course may, with the approval of the Dean, substitute elective work for any one of the prescribed courses in each semester of the freshman year. These and other elective courses may be taken in any of the schools or departments of the College, provided only that in addition to the prescribed courses not less than twenty-four credits of junior and senior work must be taken in the School of Agriculture.

Freshman Year—Second Semester Registration	Semester	
	1st	2nd
Modern English Prose (Eng. 81).....		3
General Physics (Phys. 1).....		3
Crop Production (Farm Crops 1).....		3
Live-Stock Management (A. H. 2).....		3
Elements of Dairying (D. H. 1).....		3
Practical Poultry Keeping (P. H. 6).....		2
Drill (Military 2).....		1
Gymnasium (Phys. Ed. 16).....		½
		18½

VOCATIONAL COURSES IN AGRICULTURE

The one-year vocational courses in Agriculture are not preparatory or elementary courses. They are provided especially for those who desire to obtain as quickly as possible a working knowledge of the principles of agricultural practice. They are open to young men with or without high-school preparation, and to men of mature years and practical experience, who may desire to familiarize themselves with the most modern thought on this subject.

Three one-year vocational courses are offered: I General Agriculture (see p. 83), II Orchard Practice (see p. 153), III Dairy Manufacturing (see p. 113).

In this State there are thousands of young men who are to become our future farmers and orchardists. It is to the interest both of the individual and of the State that these young men should keep pace with the rapid development of agriculture. Each and every one should have, if possible, the opportunity of obtaining an agricultural education. Many of these young men are so situated, however, that it is impossible for them to attend any of our regular four-years courses. There are also many mature men well past the usual school age, no doubt, who desire to acquaint themselves more fully with the more recent developments in agricultural science and practice. It is to meet the needs of such men, both young and old, that these one-year courses are offered. They are designed to provide the largest amount of practical information and training that can be given in one year.

ONE YEAR VOCATIONAL COURSE

GENERAL AGRICULTURE

	Semester	
	1st	2nd
General Farm Crops I, II (Farm Crops A, B).....	3	3
Farm Machines and Engines (Farm Mech. A).....	3	
*Elementary Business English (Eng. N).....		3
Stock Judging (A. H. A).....	2	
Practical Farm Drainage (Soils C).....		2
Farm Management (Farm Mgt. A, B).....	2	2
Farm Accounting (Com. E).....		2
Diseases of Domestic Animals (Vet. Med. C).....	3	
Farm Soils (Soils A).....	3	
Feeding and Management (A. H. B).....		5
Breeding, Feeding and Management of Dairy Cattle (D. H. J).....	3	
**Home Orchard and Garden (Hort. A).....		2
Gymnasium (Phys. Ed. 11, 12).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military A, B).....	1	1
	<hr/>	<hr/>
	20½	20½

* Students with credit for not less than one year's high-school English may elect a more advanced course.

** Farm Poultry may be substituted for Home Orchard and Garden upon request of not less than ten persons.

ANIMAL HUSBANDRY

ERMINE LAWRENCE POTTER, Professor
ORAN MILTON NELSON, Associate Professor
EDWARD BLODGETT FITTS, Assistant Professor, (Ext.)
EZRA JAMES FJELDSTED, Assistant Professor
DALE EVERETT RICHARDS, Instructor

The course in Animal Husbandry is planned to fit the student for the actual raising of live stock on the farm, so that he may produce the highest grade of stock in the most economical and business-like manner. The student is thoroughly grounded in the underlying principles in order that he may successfully continue his study after leaving college, but the practical details are thoroughly treated and a special effort is made to keep the students in close touch with the financial phases of the industry. Students who take this work as their specialty are expected not to devote their entire time to live stock; but, on the contrary, to familiarize themselves with crop production, soil fertility, and other phases of general agriculture. They are expected also to study English, Economics, Commercial Law, and kindred subjects, all of which are so essential in the training of the young man who expects to become not only an up-to-date business stockman, but a good useful citizen.

Students electing to major in Animal Husbandry must have had considerable practical experience in farming and stock raising before they will be allowed to graduate. The nature and extent of the experience required will be left to the judgment of the head of the department.

Students not majoring in Animal Husbandry but desiring to elect some work in the department, will be given careful attention to see that they get just the work fitted to their individual needs.

Equipment. The equipment of the department of Animal Husbandry consists essentially of live stock, barns, and the College stock farms. During the past year the live stock available for illustration and demonstration purposes has been very much improved in numbers and in quality. The College flocks and herds now include typical specimens of Shorthorn and Hereford cattle, Cotswold and Shropshire sheep, Berkshire, Yorkshire, Poland China and Duroc Jersey swine, Percheron, Belgian, Clydesdale, Shire, American Saddle, and Standard-bred horses, together with the live stock used in experimental work. In addition to the live

stock regularly kept on the College farm, much good stock is loaned from time to time by the leading breeders of the State. During the winter, carload lots illustrating the market classes are brought in for demonstration purposes. The department also possesses abundant maps, charts, lantern slides, stud books, a complete animal husbandry library, and other equipment for the conduct of laboratory, lecture, and recitation work.

The department has just completed what is considered the most convenient and modern hog barn in America. This building will aid materially in the instructional and experimental work with hogs.

COURSES IN ANIMAL HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st.	2nd
Junior Year		
Business Law (Com. 31).....		3
Animal Chemistry (Chem. 509).....	2	
Comparative Anatomy (Vet. Med. 1).....	3	
Comparative Physiology (Vet. Med. 2).....		3
Breeds of Stock (A. H. 250, 260).....	4	4
Forage Crops (Farm Crops 9).....	2	
Animal Nutrition (A. H. 7).....		2
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
Elective	4	3
	17	17

Senior Year		
Diseases of Live Stock (Vet. Med. 3, 4).....	3	3
Principles of Breeding (A. H. 6).....		3
Advanced Stock Judging (A. H. 16).....	3	
Seminar (A. H. 18, 10).....	1	1
Live Stock Economics (A. H. 110).....		3
Feeds and Feeding (A. H. 21).....	5	
Electives	4	6
	16	16

The following courses are offered:

1. Stock Judging. The various types of farm animals are studied by score card and comparative methods, and the student made familiar with the desirable and undesirable types of beef and dairy cattle, sheep, swine, and horses.

Agriculture; freshman year; first semester; 2 credits; 3 laboratory periods. Fee \$0.25. Text: Vaughan, Type and Market Classes of Live Stock.

2. Live-Stock Management. Practical details of the care and management of live stock, stabling, grooming, sanitation, practical feeding, and kindred details of live-stock farming, all with especial reference to Oregon conditions.

Agriculture; freshman year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50. Text: Potter, Live Stock Management.

6. Principles of Breeding. The principles of breeding as related to the development of our domestic animals; variation, transmission of variations and modifications, fecundity, inbreeding, crossing, and like topics.

Prerequisites: Botany 41 and 42; Zoology 108, 109. Animal Husbandry; senior or graduate year; second semester; 3 credits; 3 recitations. Text: Walter, Genetics.

7. Animal Nutrition. The chemical and physiological principles of animal nutrition; the function of the various classes of nutrients when taken into the animal body; nutritive ratios; feeding standards; compounding rations; and the general significance of the chemical composition and energy value of feeds.

Prerequisites: Chemistry 500 and 501. Animal Husbandry and Dairy Husbandry; junior year; first and second semester; 2 credits; 2 recitations. Text: Henry and Morrison, Feeds and Feeding.

13. Research Work. The student is expected to select some line for individual investigation, either by library methods or otherwise. The object is: first, to allow the student to study some particular subject in which he is especially interested; and second, to give him training in working out problems for himself, such as he will have to undertake after leaving college. This course is open only to those who are taking Animal Husbandry as

their major, or who have taken practically all of the regular courses in Animal Husbandry.

Animal Husbandry; elective; senior year; first semester; credits and hours to be arranged.

14. Research Work. A continuation of course 13.

Animal Husbandry; elective; senior year; second semester; credits and hours to be arranged.

15. Stock Judging II. An elective course in the judging of all kinds of stock.

Prerequisite: A. H. 1. First semester; 2 credits; 1 recitation; 2 two-hours laboratory periods. Fee \$0.25.

16. Advanced Stock Judging. Practical judging of all kinds of live stock, with occasional trips to fairs and stock farms. Judging teams for the Pacific International Stock Show will be chosen for the most part from this class.

Prerequisites: At least four credits of stock judging. Animal Husbandry; senior or graduate year; first semester; 3 credits; 4 two-hours laboratory periods. Fee \$0.25.

18. Seminar. Weekly meetings in which papers on Animal Husbandry subjects are read and discussed. These papers are prepared under the supervision of the department, although considerable latitude is allowed in the selection of subjects and the manner of presentation.

Animal Husbandry; junior or senior year; first semester; 1 credit.

19. Seminar. A continuation of course 18.

Animal Husbandry; second semester; 1 credit.

21. Feeds and Feeding. An advanced course in the feeding of horses, beef cattle, sheep, and swine, consisting of a thorough training in the most approved methods of stock feeding. Especial study is made of the practices of the best stockmen, and of the investigations carried on by the various experiment stations. Students desiring to take only such parts of the course as relate to certain lines of live stock will be permitted to do so by arrangement with the head of the department.

Prerequisite: Animal Husbandry 7. Animal Husbandry; senior or graduate year; first semester; 5 credits; 5 recitations; Text: Henry and Morrison, Feeds and Feeding.

23. Feeds and Feeding. A condensed course intended for those students who do not have the time necessary for Courses 7 and 21. While brief, the work is complete in itself and does not depend upon any other course. The feeding of beef cattle, sheep, hogs, and horses is studied with reference to both principles of nutrition and farm practice.

Prerequisite: Animal Husbandry 2. Elective to juniors and seniors in all agricultural courses except Animal Husbandry; second semester; 3 credits; 3 recitations. Text: Henry and Morrison, Feeds and Feeding.

24. Pork Production. Feeding and Management of hogs with especial reference to dairy farm conditions.

Prerequisite: Animal Husbandry 7. Dairy Husbandry Elective; junior or senior year; second semester; 3 credits; 3 recitations.

101. Live-Stock Practice. Laboratory studies devoted to such work as dipping, dehorning, hoof trimming, shearing, horse training, and other common operations of the stock farm.

Senior Animal Husbandry students only; first semester; 1 credit; 1 three-hours laboratory period. (Note.—The department reserves the right to limit the number of students in this course.) Fee \$0.50.

102. Live-Stock Practice. A continuation of Course 101.

Animal Husbandry; second semester; 1 credit; 1 three-hours laboratory period. Fee \$0.50.

103. Horsemanship. Drill in practical handling of draft, driving, and saddle horses with a view to both farm and military work.

Prerequisite: Animal Husbandry 1 and 2. Elective; 50 hours laboratory work each semester; 1 credit. Both semesters. Fee \$4.00.

110. Live-Stock Economics. An advanced course in management dealing particularly with the economic and financial phases of live-stock production.

Animal Husbandry seniors only; second semester; 3 credits; 3 recitations.

250. Breeds of Live Stock. A study of the breeds of horses and beef cattle, their development, breeding and type.

Prerequisite: Animal Husbandry 1 or A. Sophomore year; first semester; 4 credits; 2 recitations; 2 three-hours laboratory periods. Fee \$0.25.

260. Breeds of Live Stock II. A study of the breeds of sheep and swine, their development, breeding, and type.

Prerequisite: Animal Husbandry 1 or A. Sophomore year; second semester; 4 credits; 2 recitations; 2 three-hours laboratory periods. Fee \$0.25.

300. Pedigree Study. A laboratory study of the blood lines of the various breeds of live stock. Each student is expected to select one or two breeds as the basis for special study rather than to attempt to cover all breeds.

Animal Husbandry; elective; senior or graduate year; second semester; credits and hours to be arranged.

400. Advanced Hog Feeding. A study of experimental data relating to hog feeding problems.

Animal Husbandry; elective; graduate year; second semester; 2 credits; hours to be arranged.

411. Graduate Research. Graduate students will be given opportunity to carry on research work along any lines desired. The department is especially well equipped for graduate work along the lines of experimental feeding of hogs, sheep, and beef cattle, live stock management, and all forms of library work with either experiment station or general live-stock literature.

Animal Husbandry; elective; graduate year; first semester; credits and hours to be arranged.

412. Graduate Research. Continuation of Course 411.

Animal Husbandry; elective; graduate year; second semester; credits and hours to be arranged.

A. Stock Judging. A thorough drill in the judging of beef cattle, sheep, swine, and horses, accompanied by text-book and lecture work on types and breeds of live stock.

Vocational; first semester; 2 credits; 3 laboratory periods. Fee \$0.25. Text: Vaughan, Type and Market Classes of Live Stock.

B. Feeding and Management. The practical details of the feeding, care, and management of all kinds of live stock, with special reference to practices common in the West.

Vocational; second semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$1.00. Text: Potter, Live Stock Management.

F. Animal Husbandry for the Orchard. A study of (a) feeding and handling of farm work horses, and (b) feeding and management of hogs with special reference to orchard conditions.

Vocational course in Horticulture; second semester; 1 recitation; 1 laboratory period. Fee \$0.50.

BACTERIOLOGY

THEODORE DAY BECKWITH, Professor
GODFREY VERNON COPSON, Associate Professor
_____, Instructor

Bacteriology, although comparatively a new field of study, has become an every-day interest and has taken a place deservedly prominent among the sciences. It is essential that every student in Agriculture, Pharmacy, or Home Economics acquire at least a general knowledge of the fundamental principles of bacteriology in order to get a thorough understanding of his work.

Since technical bacteriology is usually a totally unfamiliar field to the new student, the first courses are necessarily general in character, although every effort is made towards direct application whenever possible. The work, therefore, is both theoretical and practical. Courses are commenced in the sophomore year to enable the student to continue along definite specialized lines during the junior and senior years. This thorough preparation is given along certain specific lines in bacteriology, such as Soils, Dairying, Domestic Science, Pharmacy, Sanitation, etc. The advanced work undertakes from a bacteriological point of view the problems of the major work of the student, who is trained not only in technique, power of observation, and the principles of bacteriology, but also in power of resourcefulness, initiative, and individual responsibility.

For the proper understanding of bacteriology, it is necessary to have had at least a course in general chemistry, which is a prerequisite for all students except those in the vocational courses.

Equipment. The department of bacteriology is located on the fourth floor of the Agricultural building. It occupies two large laboratories for general class work, one for special soil bacteriology and a laboratory for combined Experiment Station and Research Work. In addition there are the offices of the members of the department, a small but well-selected library including most of the authoritative works on bacteriology, besides a good list of the leading American and foreign periodicals. A dark-room, well-equipped for work in photomicrography, a store-room and large incubator room with automatically controlled temperature, is furnished for student use. The department is well supplied with the highest grade microscopes, ample glassware, both precision and common, and lead-topped desks.

Individual wall lockers, cylindrical and square copper sterilizers, supplied with steam from the main heating plant, small and large hot-air sterilizers, a large steam-pressure, horizontal sterilizer, the latter arranged for "dry-steam" sterilization, are conveniently arranged in the general laboratory for the larger sections. Small incubators are used by the advanced students. For special work demanding an extraordinary degree of exactness, there is a large electrically controlled and heated incubator. Lead-topped tables with convenient drawers furnish ample working space. Hot water, which is supplied to all laboratories, is fed by the main water system from a large hot-water tank. Sinks are uniformly lead. A high-power centrifuge is used. All the other necessary minor equipment for work in bacteriology is at the disposal of elementary and advanced students.

Major Courses. The purposes of these courses is to train students for Agricultural College and Experiment Station positions; for work in the Scientific Bureaus of the United States Department of Agriculture; for positions as Sanitary and Milk Inspectors with various State and City Boards of Health; as Laboratory Technicians for Health and Sanitary Boards and for Hospital Service; and likewise for testing laboratories for corporations, such as creameries, and producers of various food products.

Military Value. The various courses in Bacteriology are of direct value in preparation of men for the Sanitary Corps and Medical Corps of the United States Army and Navy.

COURSES IN BACTERIOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
	17	17

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

	Senior Year	Semester	
		1st	2nd
National Government (Com. 320).....		3	
State and Municipal Government (Com. 322).....			3
* Electives		13	13
		—	—
		16	16

The following courses are offered:

103. General Bacteriology. A series of lectures, recitations, and experiments to familiarize students with the underlying principles of bacteriology as applied to everyday life, especially to agricultural problems; and to serve as an introduction to the more advanced courses in the subject.

Prerequisite: one year's work in chemistry. Agriculture, sophomore year; Pharmacy, junior or senior year; either semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

104. General Bacteriology. A course supplementing the lecture and laboratory work of Bacteriology 103.

Prerequisite: Bacteriology 103. Pharmacy; junior or senior year; Agriculture; elective; sophomore, junior, and senior year; second semester; 3 credits; 2 laboratory periods; 2 recitations or lectures. Fee \$3.00.

112. Advanced Bacteriology. Beginning with the first semester of the junior year, a student may elect bacteriology for the two semesters of that year, and continue advanced work through the two semesters of the senior year.

Prerequisite: Bacteriology 103. Agriculture; elective; junior year; first semester; 5 credits; 1 lecture; 2 recitations; 3 laboratory periods. Fee \$5.00.

113. Advanced Bacteriology. A continuation of course 112, the laboratory work familiarizing the student with special bacteriological apparatus and its use, and then proceeding with advanced work involving questions of pure science, as well as the application of bacteriology to professions and industries.

Prerequisite: Bacteriology 112. Agriculture; junior year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods. Fee \$4.00.

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

114. Seminar. A discussion of the most important literature on the subject.

Agriculture; seniors, juniors and graduates; 1 credit; 1 hour.

116. Research in Bacteriology. A thesis may be selected in this subject, beginning with the first semester, senior year, major bacteriology, and continuing through two semesters. The laboratory is thoroughly well equipped for research in agricultural, veterinary, domestic science, or pharmaceutical bacteriology. Work for the master's degree, either as a major or minor in the department, may be selected. The investigations are all outlined and conducted by the student in cooperation with the instructional staff of the department.

Prerequisite Bacteriology 112 and 113. Agriculture; elective; junior year; credits and hours to be arranged. Fee \$5.00.

205. Immunity and Vaccine Therapy. A study of the standard methods in vogue in the various immunity and therapeutic reactions, antitoxin formation, preparation and standardization of vaccines.

Prerequisites: Bacteriology 201, 202, or equivalents. Agriculture or Pharmacy; elective; senior or graduate year; time and credits to be arranged. Fee \$3.00.

302. Zymology and Ferments. An elective for students in Home Economics who desire a specialized course dealing with technical fermentations and microscopic structure of the yeast plant and other fermentation organisms; the preparation and manipulation of special media designed for their growth; pure culture methods used in zymology, methods of laboratory testing of commercial yeasts, both for use in breadmaking and alcohol production, the bacteriology of salt-rising bread.

Prerequisite: Bacteriology 300 or equivalent. Home Economics, or for students of other courses of equivalent preparation; elective; junior or senior year; either semester; 2 credits; 2 laboratory periods. Fee \$3.00.

304. Home Economics Bacteriology. Deals with bacteriology in relation to home life. An introduction to the subject, therefore, is made along theoretical lines, with application to sanitation and household practices. Water supply, action of septic tanks, house sanitation, control and prevention of specific diseases, fumigation, vinegar making, methods of contamination of milk, canning, treatment of wounds, etc.

Prerequisite: one year of chemistry. In its structure, this course parallels Bacteriology 103, with application to the problems of Home Economics. Home Economics; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

305. Home Economics Bacteriology. Primarily for Home Economics students in continuation of Bacteriology 304. Standard sanitary bacterial examination of water, milk, butter, cheese, meat, air, etc., certain simple clinical methods. Use and action of anti-septics and germicides.

Prerequisite: Bacteriology 304 or equivalent. Home Economics, or students from other departments with equivalent preparation; elective; junior or senior year; either semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

401. Dairy Bacteriology. History of dairy bacteriology, physiology of bacteria, chemical reactions in dairy products due to bacteriological activities; standard methods of bacterial analysis of dairy products, methods of sanitation, disinfection, diagnosis of diseases and faults of milk, control of milk-borne epidemics, preparation of commercial health drinks such as Bulgarian milk, Yoghurt, etc., discussions of milk problems.

Prerequisite: Bacteriology 103. Agriculture; senior year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

402. Dairy Bacteriology. Continuation of Course 401. A detailed study of specific problems in dairy bacteriology, practice in special technique and methods. Individual problems assigned, literature reviewed, and discussed. Course designed fundamentally to develop initiative and resourcefulness of student. Work adapted to particular needs of individual students as far as possible.

Prerequisites: Bacteriology 103 or 401; Chemistry 501 or equivalent. Agriculture; junior or senior year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

501. Agricultural Bacteriology. The history and development of bacteriology as applied to scientific agriculture, micro-organisms in relationship to soil fertility, the destruction of organic matter and humus formation, plant food requirements and bio-chemicals of the decomposition changes supplying such food, soil nitrogen requirements, the nitrogen cycle, nitrogen fixation by legume bacteria, media for the isolation and growth of soil organisms, soil types from the bacteriological point of view, ammonification, nitrification, denitrification, nonsymbiotic nitrogen fixation.

Prerequisite: Bacteriology 103. Agriculture; senior year; first semester; 3 credits; 1 recitation, or lecture; 2 laboratory periods. Fee \$3.00.

502. Agricultural Bacteriology. A continuation of bacteriology 501. A detailed study of soil changes due to micro-organisms. The effect of liming, manuring, and various methods of tillage, irrigation, and drainage, the activities of sulfur and iron bacteria, cellulose digestion, reference work to certain government and station bulletins, followed by abstract writing of the same for class use and discussion.

Prerequisites: Bacteriology 103 and 501. Agriculture; senior year; second semester; 3 credits; 1 recitation or lecture; 2 laboratory periods. Fee \$3.00.

701. Poultry Disease Bacteriology. The bacterial consideration of the most common diseases of poultry, chicken tuberculosis, chicken typhoid, white diarrhoea, roup, and avian diphtheria; soil contamination, and other methods of disease transportation.

Prerequisites: Bacteriology 103, 104, or equivalent. Agriculture; junior or senior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00.

711. Military Sanitation. A discussion of the laws of sanitation as applied in military practice. A war-emergency course dealing with the sanitation of the camp, protective inoculations, the carrier problem, and other questions of like nature directly related to the health of the recruit. Open to all students; either semester; $\frac{1}{2}$ credit; 1 two-hours laboratory period every two weeks. No fee.

A. Vocational Dairy Bacteriology. This course includes the bacteriological studies of milk, butter, and cheese; examination of starters, efficiency tests of pasteurization, cooling, straining, centrifuging, etc., and the general sanitation and cleanliness of the dairy.

Vocational Dairying; second semester; 2 credits; 1 lecture; 2 laboratory periods. Fee \$2.00.

B. Preventive Medicine. A consideration of certain common diseases of the human body, their cause, path of entrance, path of exit, method of transmission, and preventive methods to be taken against them; domestic water supply, pure milk, the action of germicides and antiseptics.

Vocational Home Economics; first semester; 1 credit; 2 lectures or recitations.

BOTANY AND PLANT PATHOLOGY

HOWARD PHILLIPS BARSS, Professor
WINFRED MCKENZIE ATWOOD, Associate Professor
WILLIAM EVANS LAWRENCE, Assistant Professor
MARION BERTICE MCKAY, Assistant Professor
CHARLES ELMER OWENS, Assistant Professor
HELEN MARGARET GILKEY, Assistant Professor and Curator
of the Herbarium
JOHN TAYLOR BREGGER, Fellow
JULIET NORMA ANDERSON, Fellow

The courses offered in this department aim not only to give the student a broad knowledge of plants, their structure both external and internal, their vital activities, their relationships to their environment and their natural classification, but also to impart such fundamental and practical information in regard to plants as shall form a strong foundation for the technical work in Agriculture, Forestry, Pharmacy, and Home Economics.

The general courses are so planned as to present the principles of botany from a genuinely scientific point of view, and then to show how the knowledge thus presented applies in a practical way to the problems which the students will meet in the life-work they have chosen. In order that the different needs of students pursuing different lines of work in the institution shall be met in the best possible way, separate sections are provided and the work in each section is planned with the particular interest and needs of that section in mind.

Technical and reference books are used mainly as an aid in correlating the facts brought out by the study of the actual plant specimens in the laboratory. Living plants are used wherever possible. Drawing is made an important feature of the laboratory work, because in order to draw accurately the students must observe closely.

Exceptional opportunities are afforded students who desire to specialize in botany or plant pathology. Well-equipped laboratories and the unusually favorable location for field study and collecting, offer an attractive inducement for those interested in advanced work. Special attention will be given to students wishing preparation for teaching economic biology or botany in the secondary schools, or the teaching of botany or plant pathology in Agricultural Colleges. Training is also provided for those who wish to enter the field of investigational work in Agricultural Experiment Stations, or in the United States Department of Agriculture under

the Civil Service. Agricultural extension workers, horticultural inspectors, district agriculturists, seed analysts, and pure-food experts will find special training in Botany and Plant Pathology a most valuable asset.

Equipment. The Department of Botany and Plant Pathology occupies quarters on the second floor of the Agricultural Building at the south end. There is a lecture room provided with projection lantern. There are three general student laboratories well equipped for botanical work, compound and dissecting microscopes being provided for each student. The work in plant physiology is conducted in a laboratory provided with individual lockers and equipment for each student. The laboratory is well supplied with apparatus for general course work and for special investigation, including accurate analytical balances, coarse balances, muffle furnace, electrical ovens, apparatus for the study of the respiration of fruit, meteorological instruments, chemicals, laboratory glassware, reagents, etc. Greenhouse facilities and a dark room for experimentation are also provided. The library room contains a large number of volumes of American and foreign reference works relating to botany and plant pathology, complete sets of important scientific periodicals, increased yearly by the current numbers, and a rapidly growing collection of bulletins and papers of interest to workers and students in the department. A large room is set apart for an herbarium and here accommodation is provided for students in taxonomic botany for the rapid drying and mounting of pressed plants. In the advanced laboratory a number of desks are available for special and graduate students and the equipment for advanced work in plant histology and microscopic technique includes a large electric paraffin bath, microtomes of different types, stains, chemicals, and glassware. For advanced students in plant pathology there is available an unusually well-equipped experimental laboratory, provided with thermostatic incubators, refrigerator, inclosed culture room, transfer case, electrical dry-air sterilizer, horizontal autoclave, and steam sterilizers connected with the central steam plant. There is also a photomicrographic apparatus and an excellent equipment for photographing ordinary specimens in the laboratory or in the field. A suitable photographic dark room is provided.

For demonstration and lecture purposes, the department possesses an excellent set of charts and models, a large collection of lantern slides, photographs, and illustrative material. A museum

exhibit of botanical and plant-disease specimens of great value and interest has been got together and is easily accessible to all students.

The surroundings of the Institution are particularly favorable for botanical study. On the campus are planted an interesting variety of trees, shrubs, and ornamental plants from various parts of the world, while a great diversity of economic plants are propagated on the College farm. The country about Corvallis furnishes an interesting variety of topographic features and provides within easy distance the flora of the hill and valley, plain and mountain, meadow and forest. Of interest to students in plant pathology is a small corner of the College farm which has been set out with a great variety of fruits for the study of plant diseases.

The permanent equipment of the department includes an herbarium of flowering plants and gymnosperms of many thousand specimens which contains, in addition to Oregon forms, quite extensive collections from New Mexico, California, Washington, and Michigan. The herbarium is being rapidly enlarged, particular attention being paid to the accumulation of economic material, including the forage and shade trees of North America, agricultural plants, pharmaceutical plants, weeds and grasses. The cryptogamic herbarium includes several thousand specimens of fungi from North America and Europe, being particularly rich in parasitic forms.

COURSES IN BOTANY AND PLANT PATHOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Junior Year	Semester	
		1st	2nd
Agricultural Economics (Com. 219).....	3		
Drill (Military 5, 6).....	1		1
Military Science (Theo. Inst. 1, 2).....	1		1
* Electives	12		15
<hr/>			
	Senior Year	Semester	
		1st	2nd
National Government (Com. 320).....	3		
State and Municipal Government (Com. 322).....			3
* Electives	13		13
<hr/>			
		16	16

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

The following courses are offered:

24. Botany for Home Economics Students. An introduction to botanical science as applied to the home. Brief discussion of food plants; manufacture of food substances by plants; fiber plants; structure and value of woods; relation of house and garden plants to soil, air, light, and moisture; organisms of decay in relation to preservation and storage of foods, etc.

The course in Home Economics; freshman year; first or second semester; 2 credits; 1 lecture; 1 recitation; 1 laboratory period of 2 hours. Fee \$1.50. Text: Ganong, *A Textbook of Botany for Colleges*.

30. Forest Botany. Provides the basis for an adequate understanding of the forest and of the underlying principles of forestry. The structure, reproduction, and physiology of seed plants. The microscopic study of wood. The identification of trees and shrubs in their winter condition. The characteristics and relationships of the four great plant groups. An introduction to the identification of higher plants. Continued throughout the year.

The course in Forestry; sophomore year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25; Deposit \$0.50. Texts: Gager, *Fundamentals of Botany*. Stevens, *Plant Anatomy*.

31. Forest Botany. Continuation and completion of work described under course 30. Prerequisite: Botany 30. The course in Forestry; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Deposit \$0.50. Texts: Gager, *Fundamentals of Botany*. Stevens, *Plant Anatomy*.

36. Range and Pasture Botany. Study and identification of native plants of importance for forage and pasturage and native hay, and of the stock-poisoning plants, their distribution and localization. Of interest to students of Forestry, Animal Husbandry, Dairy Husbandry, and Veterinary Science.

Prerequisite: Botany 30 and 31, or 41 and 42, or their equivalent; elective; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Text: Piper and Beattie, *Flora of the Northwest Coast*.

37. Forest Pathology. The parasitic and saprophytic fungi which attack forest trees and destroy structural timber; the effect of these organisms upon the wood, and a consideration of preventive measures.

Prerequisites: Botany 30 and 31, or 41 and 42. The course in Forestry; sophomore year; elective for others; second semester; 1 credit; 1 lecture; 1 laboratory period. Fee \$0.75.

41. Agricultural Botany. The fundamental principles of botany underlying agricultural practice. The structure, physiology, and development of higher plants from the seed to the flower. The structure and development of fruits, grains, fleshy roots, and tubers. A survey of the plant kingdom from its lowest to its highest forms with special emphasis on the groups of agricultural importance. Particular attention directed to food plants, stock-poisoning plants and the organisms causing disease in plants. A brief systematic study of agricultural and other economic plants with practice in identification. Continued through the year.

The course in Agriculture; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Deposit \$0.50. Text: Ganog, A Textbook for Colleges.

42. Agricultural Botany. Continuation and completion of work outlined under course 41.

Prerequisite: course 41. The course in Agriculture; freshman year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Deposit \$0.50. Text: Ganog, A Textbook for Colleges.

50. Plant Physiology. An introductory course in experimental Plant Physiology designed to impart a knowledge of the life-processes of the plant as a basis for intelligent agricultural and horticultural practice. Plant nutrition, growth, and response to environment. The functions of the living cell, the intake by the plant of water and raw materials from the soil. The transportation of materials through the plant. The loss of water. The manufacture, digestion, and assimilation of food, and the process of respiration.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70, and in addition, Chemistry 500 and 501. The course in Pomology; the course in Farm Crops; and the course in Botany or Plant Pathology; junior year; elective for others; second semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Duggar, Plant Physiology.

52. Advanced Plant Physiology. Special studies of plant physiological problems of present-day interest and importance. Extensive reading and class reports on selected topics. Methods of investigating scientific literature emphasized.

Prerequisite: Botany 50. Elective; first semester; 3 credits; 1 lecture; 2 recitations; (additional credits may be taken by special arrangement). Fee \$2.25.

67. Economic Ecology. The relations between the environment and the plant. The factors affecting the distribution of plants, and the occurrence of plant associations and successions. Ecological problems of the forest, grazing range, and farm. Field studies in physiographic ecology, including the methods of plant survey.

Of interest to the student of botany, forestry, grazing, agricultural economics, irrigation and drainage, plant introduction, geology, and to all who expect to enter State or Government field service.

Prerequisites: Freshman Botany, and Botany 36, 47, or 68. Elective; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Text: Cowle's Ecology.

68. Classification of Flowering Plants. Native Oregon flowers and common cultivated ornamental plants. Collecting, identifying, pressing, and mounting of specimens by each student.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70; elective; second semester; 3 credits; 1 lecture; 1 laboratory period; and 1 field excursion for Saturday morning. Fee \$2.25. Texts: Piper and Beattie, The Flora of the Northwest Coast. Gray, Field, Forest and Garden Botany.

69. Weeds and Poisonous Plants. The collection, identification, and classification of weeds, poisonous plants, and other economic plants.

Prerequisites: Botany 30 and 31, or 41 and 42, or 70. The course in Agricultural Education. Elective for others; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods of 3 hours each. Fee \$2.25.

70. Pharmaceutic Botany. A fundamental, preparatory course for Pharmacognosy and Materia Medica. A brief survey of the plant kingdom. A careful study of the structure of higher plants. The cell and cell contents. Various types of plant tissues. Work in elementary pharmacognosy with training in the microscopic identification of drugs and drug adulterants. In the spring practice is given in the identification of drug plants. Continued through the year.

The course in Pharmacy; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25.

Deposit \$0.50. Texts: Youngken, *Pharmaceutical Botany*. Greenish, *Food and Drugs*. Mansfield, *Histology of Medicinal Plants*.

71. Pharmaceutic Botany. Continuation and completion of work outlined under course 70.

Prerequisite: Botany 70. The course in Pharmacy; freshman year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods. Fee \$3.00. Deposit \$0.50. Texts: Greenish, *Foods and Drugs*. Youngken, *Pharmaceutical Botany*. Mansfield, *Histology of Medicinal Plants*.

73. Plant Evolution and Structure. The evolution of form, structure, and methods of reproduction for all groups of plants. Evolutionary tendencies and homologies of structure and function. An advanced course dealing with fundamental principles. The detailed examination in laboratory of selected types from the lowest to the highest groups of plants.

Prerequisites: Botany 22 and 23, 30 and 31, or 41 and 42, or 70. The course in Botany; junior or senior year; elective for others; first semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$2.25. Texts: Coulter et al, *A textbook of Botany*. Vol. I, part 1. Coulter, *Evolution of Sex in Plants*.

75. Plant Histology. An advanced course. The structure, inclusions, activities, and methods of division of the plant cell; the development, structure, and adaptation to function of various types of plant tissues. The preparation of temporary and permanent microscopic mounts, including fixation, dehydration, infiltration, sectioning, and staining.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70 and 71. The course in Botany or Plant Pathology; junior or senior year; elective for others; first semester; 3 credits; 1 lecture; 3 laboratory periods. Fee \$2.25. Text: Stevens, *Plant Anatomy*.

80. Seminar. Required of all graduate students in Botany and Plant Pathology. Reports on advanced botanical studies. Abstracts of articles of botanical or phytopathological interest appearing in scientific journals, experiment station publications, or the agricultural press.

Elective; senior year; first semester; 1 credit will be given undergraduates regularly attending the meetings and making satisfactory reports; 1 hour session.

81. Seminar. The same as course 80 for second semester.

Elective; senior year; second semester; 1 credit as above; 1 hour.

82. Research and Thesis. For students specializing in Botany and Plant Pathology. Investigation of special problems or taking up of advanced studies not included in regular courses.

Elective; senior year; first semester; 1 or more credits (to be arranged for with instructor). Fee \$0.50 per credit.

83. Research and Thesis. Work as outlined in course 82; second semester.

Elective; senior year; second semester; 1 or more credits. Fee \$0.50 per credit.

101. Principles of Plant Pathology. Disease in plants: the causes, symptoms, effects, methods of distribution, etc. The principles of plant-disease control. Disease resistance in plants. Quarantine and inspection. Detailed examination in the laboratory of representative examples from the different groups of plant parasites. A study of various types of plant diseases, their life-histories and their microscopic appearance.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70. The courses in Pomology, Olericulture, Farm Crops and Farm Management; junior or senior year; elective for others; Horticultural students are expected to enroll in section 1; Agronomy students in section 2; first semester; 2 credits; 1 lecture; 2 laboratory periods. Fee \$1.50. Text: Duggar, Fungous Diseases of Plants.

102. Diseases of Orchard and Small Fruits. The causes, symptoms, progress, and control of the important fungous, bacterial, and physiological diseases of orchard trees, and small fruits, with particular emphasis on those of importance in the Pacific Northwest. Laboratory study of specimens showing the effects of the parasite on the tissues of the host, and the microscopic appearance of the causal organisms. Frequent field excursions to demonstrate the characteristic results of different diseases under natural conditions.

Prerequisite: Botany 101. The course in Pomology; senior year; elective for others; second semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$1.50. Text: Hesler and Whetzel, Manual of Fruit Diseases.

104. Diseases of Vegetable Crops. The causes, symptoms, progress, and methods of control of the important fungous, bacterial, and other diseases of truck and garden vegetables and fruits with particular attention to those which are serious in the North-

west. Careful laboratory study of typically diseased specimens with microscopic examination of the affected tissues and of the parasitic organisms. Field excursions.

Prerequisite: Botany 101. The course in Olericulture; senior year; elective for others; second semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$1.50.

105. Diseases of Field Crops. The causes, symptoms progress, and methods of control of the important fungous and bacterial diseases of cereals and other field and forage crops, with particular attention to those of importance in the Northwest. Typical examples of the diseases are studied in the laboratory. Microscopic examination of the affected tissues and of the causal parasites.

Taken simultaneously with Botany 101, Section 2. The course in Field Crops, junior year, and Farm Management, senior year; elective for others; first semester; 1 credit; 1 laboratory period. Fee \$0.75.

111. Laboratory Methods in Plant Pathology. A training course in methods of investigation in plant pathology. Record keeping; care of collections; culture work; inoculation methods; photographic work, etc.

Prerequisite: Botany 101. The course in Plant Pathology; junior or senior year; elective for others; second semester; 2 credits; 1 lecture; 2 laboratory periods. Fee \$2.00. Text: Harshberger, Mycology and Plant Pathology.

113. Methods of Control of Plant Diseases. A lecture course on the special methods employed in the practical control of plant diseases, including the use of various fungicides for different types of diseases; the time and methods of application; surgery; sanitation; crop rotation; the development of resistant varieties; soil disinfection; seed treatment, etc.

Prerequisite: Botany 101. The course in Plant Pathology; junior or senior year; elective for others; second semester; 1 credit; 1 lecture.

116. Advanced Plant Pathology. Special studies in the field and in the laboratory of plant diseases, plant disease problems, or parasitic fungi; designed to provide training and experience in phytopathological investigations, or to extend the student's knowledge of plant diseases beyond the limits attained by the introductory courses.

Prerequisite: Botany 101. The course in Plant Pathology; senior year; elective for others; second semester; 2 or more credits; 1 lecture; laboratory periods to be arranged with instructor. Fee \$2.00.

118. Mycology. The different groups of fungi; their structure; modes of reproduction; nuclear phenomena; phylogeny and classification, with particular attention to parasitic forms.

Prerequisite: Botany 101. The course in Plant Pathology; senior year; elective for others; first semester; 3 or more credits; two lectures; 2 or more laboratory periods. Fee \$2.00. Text: Harshberger, Mycology and Plant Pathology.

Graduate Courses. Botany 52, 80, 81, 82, 83, 111, 113, 116, and 118 may be taken by graduate students as major or minor electives with full credit.

Opportunity will be given students to elect work in Economic Botany or Plant Pathology not offered in the above mentioned courses by registering in Botany 82 or 83, either as a major or minor subject. Students who elect Botany as a major must have completed the work, or equivalent, required in the freshman year of the Agricultural course.

Grazing Assistant Positions. Students preparing for grazing assistant positions under the U. S. Forest Service should take the following botanical courses: Botany 30, 31, (or 41, 42) 50, 67, 68, (or 69).

Note: Any of the courses in Botany except 24, 30, 31, 41, 42, 70, and 71, may be taken as minor electives by junior, senior, or graduate students in any course, upon consultation with the head of the department, provided the course to be elected is not regularly required in the course of study in which the student is registered.

DAIRY HUSBANDRY

PHILIP MARTIN BRANDT, Professor
VINCENT CHAPPEL, Assistant Professor
EDWARD BLODGETT FITTS, Assistant Professor (Ext.)
EDGAR LEROY WESTOVER, Assistant Professor (Ext.)
PAUL STANLEY LUCAS, Instructor
LEON WALTON WING, Jr., Instructor
HAROLD RAY TAYLOR, Assistant

Dairy Production and Dairy Manufacturing are the courses which the Dairy department offers.

Dairying is rapidly becoming the leading animal industry of the United States. The last census report shows that there are more than twenty million dairy cows in the United States and the annual value of their products is approximately six hundred million dollars.

Since the population of the country is rapidly increasing, as is also the per capita consumption of dairy products, it seems likely that the importance of the Dairy Industry will continue to advance.

The Pacific Northwest, on account of its even temperature and abundant growth of forage crops, is peculiarly adapted to dairying; and the rapid growth of this industry is creating splendid opportunities for young men in the various fields of dairying, such as the breeding of pure-bred dairy cattle, the management of dairy farms, and the management of creameries, cheese factories, and city milk plants. There are many other openings in government work, college work, and county advisory positions for those who do not care to enter the field of practical dairying.

The production and manufacturing courses are so arranged that the student may major in one course, and yet elect enough of the other course to enable him to have a working knowledge of that phase of the industry.

In the production work, it is the intention to give the student a thorough course in the breeding, feeding, judging, care, management, and diseases of dairy cattle.

In order to meet the needs of the industry and the demand for information, the department offers the following courses: A one-year course, designed to fit students for positions as operators of creameries and cheese factories or as managers of dairy farms. A winter short course in Dairy Manufacturing during Winter Short Course. The four-years course, designed to qualify students for agricultural college and experiment station work; for inspectors of

dairy products and dairy establishments in city, state, or government service; or as managers of creameries or large dairy farms.

Equipment. The Dairy building, with its three floors and its recently installed manufacturing facilities, affords convenient and modern resources for the work of this department. In the manufacturing work, it is the intention to give the student theory and practice in the manufacture of dairy products. Convenient quarters are provided for this department in the Dairy building. The equipment is such as to permit handling milk and cream on a commercial scale, thus giving the student practice under actual factory conditions. On the first floor, are the offices and manufacturing rooms, the latter including a boiler room equipped with a 15 H. P. internal furnace boiler and a 10 H. P. Jewel automatic steam engine; a farm butter-making room, in which are found hand churns, butter workers, and the various types of separators found on the market; a churn room, which is equipped with modern ripeners, combined churns, various forms of butter-molding appliances, refrigerating machine, cooling room, and ice-cream freezer; a cheese room, which is equipped with cheese vats, automatic pressure cheese press, and other equipment used in the cheese factory; and a cheese curing room.

On the second floor, are located recitation rooms, and advanced and general laboratories. The latter will accommodate one hundred twenty students in sections of forty each, and are equipped with a full line of appliances for testing milk and milk products. In the advanced laboratory, will be found moisture tests, salt tests, curd tests, and various other forms of apparatus suited to the needs of the advanced student. A circulating hot water system connects the wash sinks in all of the laboratories. Both steam and electricity are used for power purposes.

The College dairy herd consists of seventy-nine head of choice dairy cattle of the Guernsey, Jersey, Holstein-Friesian, and Ayrshire breeds. These cattle are housed in a modern dairy barn.

DEGREE COURSES IN DAIRY HUSBANDRY

(a) Dairy Production

	Semester	
	1st	2nd
Junior Year		
Forage Crops (Farm Crops 9).....	2	
Animal Nutrition (A. H. 7).....	2	
Genetics (Zool. 120).....	3	
Comparative Anatomy (Vet. Med. 1).....	3	
Animal Chemistry (Chem. 509).....	2	
Comparative Physiology (Vet. Med. 2).....		3
Herd Management and Milk Prod. (D. H. 2).....		5
Drill (Military 5, 6).....	1	1
Electives	3	6
Military Science (Theo. Inst. 1, 2).....	1	1
Seminar (D. H. 8).....	1	1
	—	—
	18	17

Senior Year

Dairy Bacteriology (Bact. 401).....	3	
Breeds and Breeding of Dairy Cattle (D. H. 5).....	3	
Diseases of Live Stock (Vet. Med. 3, 4).....	3	3
Buttermaking and Factory Management (D. H. 3).....		5
Seminar (D. H. 8, 9).....	1	1
Approved Electives	6	7
	—	—
	16	16

Dairy Manufacturing**Junior Year**

Forage Crops (Farm Crops 9).....	2	
Animal Nutrition (A. H. 7).....	2	
Business Organization and Mgt. (Com. 110).....	3	
Genetics (Zool. 120).....	3	
Dairy Chemistry (Chem. 502).....		3
Buttermaking and Factory Mgt. (D. H. 3).....		5
Milk Production and Herd Mgt. (D. H. 2).....		5
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Advanced Testing (D. H. 14).....	2	
Approved Elective	3	2
	—	—
	17	17

Senior Year

	Semester	
	1st	2nd
Cheesemaking (D. H. 4).....	4	
Dairy Bacteriology (Bact. 401).....	3	
Breeds and Breeding of Dairy Cattle (D. H. 5).....	3	
Ice Cream and Ices (D. H. 7).....		2
Dairy Mechanics (Ind. Arts 28).....		1
Dairy Mechanics (Farm Mech. 7).....		1
Seminar (D. H. 8, 21).....	1	1
Butter and Cheese Judging (D. H. 9).....		1
Market Milk (D. H. 12).....	3	
Electives	2	10
	16	16

The following courses are offered:

1. Elements of Dairying. The secretion and composition of milk, and the causes of variation in composition; brief discussion of dairy cattle, and the factors in milk production; the Babcock test applied to milk and other products; use of the lactometer; the various methods of creaming; the operation of cream separators; the care of milk and cream; making butter under farm conditions. The general principles of cheesemaking; marketing of milk; dairy by-products; statistics and economics of the dairy industry.

Laboratory. The use of the Babcock test applied to milk and dairy products, with special attention to conditions that may affect the accuracy of tests; use of the lactometer; churning and working butter; a study of the construction, operation, and efficiency of various makes of cream separators; practice in ascertaining the yield of milk and fat, and the cost of production of cows in the College herd.

Required in all courses in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$3.00. Deposit \$2.00.

2. Dairy Herd Management and Milk Production. Form and its relation to production; difference in the efficiency of dairy cows; improvement of dairy herds; methods of testing and record keeping; the use and importance of the pure-bred dairy sire in grading up the herd. **Care of the Dairy Herd:** care of the cow at time of parturition; the dairy calf and its successful development; developing the dairy heifer; care of the bull; feeding for economical

milk production and for records. Registered dairy cattle and their management, fitting for the show ring, advertising cattle, and **Dairy Farm Economics**: the preservation and saving of manure; labor; crop systems for the dairy farm, soiling, pasturing, feeds; silage crops and the making of silage; the organization and purpose of cow-testing, bull, and community breeders' association.

Milk Production: the production of market and certified milk; sources of infection and contamination of milk; the effect of different kinds of feed on flavor and healthfulness of milk; pasteurization of milk; contracts between milk companies and drivers.

Laboratory. Judging dairy cattle; scoring animals by breed and general score cards and judging classes of animals. Animals of the College herd will be used; and trips to local dairies, and an annual trip to prominent dairy farms in the Willamette Valley will be taken by College classes.

Prerequisite: Animal Husbandry 7. Required in courses in Dairy Production and Dairy Manufacturing; junior year; second semester; 3 or 5 credits; 3 recitations; 2 laboratory periods. Fee \$.025. Text: Eckles, Dairy Cattle and Milk Production.

3. Buttermaking and Factory Management. The composition of milk and cream; the effects of condition of milk and cream on the quality and yield of butter; pasteurization; starters; ripening and churning cream; packing and marketing butter. The location, organization, and construction of creameries; creamery refrigeration and management; creamery accounting; and other studies designed to fit the student to manage and operate creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; the use of starters; churning, with special attention to factors that control the composition of butter; packing and wrapping butter; the use of acidity, moisture, and salt tests.

Prerequisites: Dairy Husbandry 1, Bacteriology 101. Required in courses in Dairy Production; senior year; second semester; in course in Dairy Manufacturing; junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$2.00. Deposit \$1.00.

4. Cheesemaking. The importance of quality and composition of milk in the manufacture of cheddar cheese; composition and characteristics of common American and European cheeses; fer-

ments and fermentations and their control; factory management and construction; the making of cheddar cheese and some forms of soft cheeses.

Laboratory. Practice work in receiving and sampling milk; the use of the various tests for acidity, ferments, fats, solids, and casein; the making and curing of cheddar and other varieties of cheeses; the computation of yields, cost of manufacture, and profit; the effect of different methods of manufacture on yield and quality.

Prerequisites: Dairy Husbandry 1, Chemistry 502. Required in course in Dairy Manufacturing; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$2.00. Deposit \$1.00. Text: Van Slyke and Publow, Principles and Practice of Cheesemaking.

5. Breeds and Breeding of Dairy Cattle. A study of the application of the principles of genetics to the breeding of dairy cattle; the breeding of the principal families of the various dairy breeds.

Laboratory. Practice in the use of the breed herd books in tracing and making pedigrees. A study of methods of registering animals and advanced registry systems.

Required in courses in Dairy Production and in Dairy Manufacturing; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50.

6. Dairy Farm Equipment and Inspection. The arrangement and construction of modern dairy buildings with regard to convenience and sanitation; the various types of dairy barns, silos, milk houses, manure pits, liquid manure cisterns, and septic tanks; the essentials in construction and installation of dairy equipment, such as stall ties, milking machines, separators, coolers, sterilizers, and various utensils.

Laboratory. Practice in score-card inspection of dairy barns and milk rooms. Drawing of plans for dairy barns, silos, manure pits, milk houses, and covered sheds. The actual operation of certain dairy appliances.

Prerequisite: Elementary Bacteriology 101. Required of Dairy Production seniors; elective for Dairy Manufactures seniors; first semester; 2 credits; 1 lecture; 1 laboratory or practicum period. Fee \$1.00.

7. Ice Cream and Ices. A study of the preparation, packing, and marketing of ice creams, sherbets, and related frozen products.

Laboratory. Practice in selecting and aging of cream for ice cream; standardizing and preparing the mix for the various frozen products; the freezing, packing, bricking, molding, coloring, and sale of the various frozen products; judging ice cream and related frozen products by the score card.

Required in course in Dairy Manufacturing; senior year; second semester; 2 credits; 1 recitation; 1 three-hours laboratory period.

8. Seminar. The study and review of new experiment station bulletins, and general dairy periodicals and literature. Papers are presented by the student on dairy subjects. Practice is given in outlining investigational work.

Required of all seniors and advanced students and elective to juniors majoring in Dairy Production and Dairy Manufacturing; first semester; 1 credit.

21. Seminar. Continuation of course 8. second semester; 1 credit.

9. Butter and Cheese Judging. Judging of butter and cheese with score cards; discussion of defects of body and flavor.

Required in course in Dairy Manufacturing; senior year; second semester; 1 credit; 1 three-hours laboratory period. Fee \$1.00.

10. Advanced Judging. Practice in judging dairy animals. This work, which includes trips to fairs and breeders' farms, is especially for those who desire to try for the Dairy Judging Team.

Elective; first semester; 1 credit; 1 two-hours laboratory period. Fee \$0.25.

12. Market Milk. City milk inspection; federal, state, and city regulations; classes of milk; chemistry and bacteriology of milk from the practical standpoint; the farm market milk retailer; the village milk plant; the city milk plant; the transportation of milk; pasteurization methods; study of methods followed, apparatus used, and division of labor in large milk plants. The laboratory work includes special tests of milk, scoring of milk exhibits and milk plants, and drawing of plans and equipment for buildings.

Prerequisite: Elements of Dairy (D. H. I). Optional in courses in Dairy Production, and required in Dairy Manufacturing; junior and senior years; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$2.00. Deposit \$1.00.

14. Advanced Testing. Application of the Babcock test; use of the lactometer in detecting adulteration; practical tests for the detection of preservatives, drug adulterations, and artificial colors;

fat determinations of cheese, butter, evaporated milk, sweetened condensed milk, and ice cream; moisture tests of butter and cheese; salt, color, and casein tests of butter.

Prerequisites: Elements of Dairy (D. H. I), and General Chemistry (Chem. 100 and 101). Required in courses in Dairy Manufactures; optional in Dairy Production; senior year; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$3.00. Deposit \$2.00. Text: Van Slyke, Modern Methods of Testing Milk.

30. Research and Thesis Work. This work is offered for senior and graduate students majoring in Dairy Husbandry. Investigational problems are assigned that will give the student training and experience in experimental work.

Elective for seniors and graduate students; first semester; credits to be arranged. Fee \$2.00.

Research and Thesis Work. Effective for seniors and graduate students; second semester; credits to be arranged.

Vocational Course in Dairy Manufactures	Semester	
	1st	2nd
Elementary Business English (Eng. M).....	3	
Dairy Accounting (Com. D).....		3
Dairy Bacteriology (Bact. A).....		3
Dairy Mechanics (Farm Mech. 7).....	3	
Dairy Mechanics (Ind. Arts 228).....		2
Breeding, Feeding, and Management of Dairy Cattle (D. H. J).....	3	
Testing Dairy Products (D. H. A).....	2	
Special Creamery Test (D. H. P).....		2
Buttermaking and Factory Management (D. H. B).....	4	
Cheesemaking (D. H. C).....		5
Ice Cream Making (D. H. D).....	2	
Creamery Practice (D. H. E, F).....	2	3
Judging Butter and Cheese (D. H. H).....		1
Drill (Military A, B).....	1	1
Gymnasium (Phys. Ed. 11, 12).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	20 $\frac{1}{2}$	20 $\frac{1}{2}$

A. Testing Dairy Products. The testing of dairy products by the Babcock test, with special emphasis on conditions affecting the results of the test under practical conditions.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 1 lecture and laboratory period. Fee \$2.00. Deposit \$1.00.

B. Buttermaking and Factory Management. The principles of creamery buttermaking; construction, management, and care of the creamery; a comparison of the various methods commonly used in the manufacture of butter in creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; churning and packing butter.

Required in one-year course in Dairy Manufacturing; first semester; 4 credits; 2 lectures; 2 laboratory periods. Fee \$2.00. Deposit \$1.00.

C. Cheesemaking. The commercial manufacture of cheddar cheese, covering the process in detail; a study of other varieties of cheese; factory management and construction.

Laboratory. Practice in making cheddar and other varieties of cheeses. Records are kept of the different operations to note their effect on the finished product.

Required in one-year course in Dairy Manufacturing; second semester; 5 credits; 2 lectures; 1 four-hours laboratory period. Fee \$2.00. Deposit \$1.00.

D. Ice Cream Making. The preparation of mixes for various frozen products by different formulas; the freezing, packing, and sale of frozen products.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 1 three-hours laboratory period; 1 lecture. Fee \$2.00. Deposit \$1.00.

E. Creamery Practice. Work in the creamery, care of creamery machinery, repairing and cleaning apparatus, to familiarize the student with practical creamery work.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; laboratory periods to be arranged.

F. Creamery Practice. Continuation of E; second semester; 3 credits; laboratory periods to be arranged. Fee \$2.00. Deposit \$1.00.

H. Butter and Cheese Judging. Judging butter and cheese with score card; discussion of the defects of body and flavor.

Required in one-year course in Dairy Manufacturing; second semester; 1 credit; 1 two-hours laboratory period. Fee \$1.00.

J. Breeding, Feeding, and Management of Dairy Cattle. The history and development of the dairy breeds; a study of the breeding of the principal families of the various breeds; the selection and use of the pure-bred dairy sire in grading up the herd; the practice of inbreeding, linebreeding, and crossbreeding in improving dairy cattle. Feeding dairy cattle for economical milk production; feeding for records; developing the dairy calf; developing the dairy heifer; care of the dairy herd; care of the cow at time of parturition; methods of testing and record keeping; care and handling of the bull; the organization and purpose of cow testing, bull and community breeders' associations; the construction of dairy barns, milk houses, manure sheds, and silos; practical problems.

Required of Vocational students in General Agriculture. First semester; 3 credits; 3 lectures.

P. Special Creamery Tests. Advanced work in the use of the Babcock test. Short cuts and conveniences for rapid and efficient testing; rapid tests for adulterants and preservatives; curd, acidity, and sediment tests.

Required in one-year course in Dairy Manufacturing; second semester; 2 credits; 1 lecture and 1 two-hours laboratory period. Fee \$2.00. Deposit \$1.00.

SHORT COURSE IN DAIRY MANUFACTURES

Beginning in January each year the College offers a short course in Dairy Manufactures. This course will begin immediately after Farmers' Week in January, 1919, and will continue six weeks. This course is planned to be of help to the experienced butter and cheese makers who wish to improve their work by acquiring the latest methods. It also is of great help to the factory helpers of the butter and cheese makers who wish to train themselves for better positions. A special announcement of this course to be published later, will give full information.

ENTOMOLOGY

LESTER LOVETT, Professor

FRANK HEIDTMAN LATHROP, Assistant Entomologist

*WILLARD JOSEPH CHAMBERLIN, Instructor

Teaching Fellow

The courses in Entomology are planned to give the student sufficient knowledge of the subject to understand the proper relation of Entomology to the different phases of Agriculture; to meet the needs of the student specializing in Entomology; and to serve the needs of students from other departments in which certain special courses are required. Students who wish to elect Entomology as a major may, if they desire, specialize in one or more branches by choosing their research problems in definitely grouped subjects. These groups include General Entomology, Agricultural Entomology, Civic Entomology, Entomology for Horticultural Inspectors, and Forest Entomology.

The courses in General and Economic Entomology are intended to provide the student with sufficient training to enable him to identify the common insect pests, understand their habits and life-history, and to apply the most approved methods for their control.

Forest Entomology includes the practical investigation of certain areas of timber to determine the kind and extent of insect infestation, methods of making out correct reports on forest insect infestation, and an investigation of the principles underlying control methods.

Advanced students in Entomology are provided with excellent opportunities for special instruction and research work. The library facilities are unusually good; the insect fauna of the western part of the State is distinctive, offering many new and interesting features for investigation.

Scheduled courses in this department will not be given to a class of less than five students.

Equipment. This department now occupies three rooms on the third floor of Agricultural Hall—one office, one laboratory, and one class room. The entomological class room is equipped for twenty-four advanced students. It also contains the entomological collections and extension materials. The research laboratory is fully equipped with up-to-date apparatus for carrying on research problems. The entomological library is exceedingly rich in old

* On leave of absence.

volumes and complete sets of entomological periodicals. Through the kindness of the librarian of the U. S. Department of Agriculture, students in this department have access to entomological publications contained in the library of the Department of Agriculture and the library of Congress.

COURSES IN ENTOMOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
* Electives	13	13
	—	—
	16	16

The following courses are offered:

301. Introductory Entomology. An introduction to the study of insects by lectures, laboratory, and field exercises. Sufficient field work in collecting, and laboratory work in properly mounting and classifying insects, is provided to make the student familiar with the principal orders of insects.

Prerequisites: Zoology 101, 102. Required in the courses in Horticulture, Plant Pathology, and Entomology; elective in other courses; junior year; first semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period. Fee \$1.00. Text: Sanderson and Jackson, *Elementary Entomology*.

302. Entomology of Orchard and Small Fruits. An intensive study of the more important insect enemies of the apple, pear, prune, cherry, plum, currant, gooseberry, bramble fruits, and strawberry, and the critical examination of the methods to be employed

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

in combating them. Each important pest will be studied in the field and laboratory, with a view to becoming thoroughly familiar with the appearance of the insect and its work in all its stages of development. In this and succeeding courses in Entomology the rearing of economic and other forms of insects, is carried on parallel with other work, to gain familiarity with the development and habits of insects. Each student is required to familiarize himself with the life-history, habits, and methods of controlling some insect of economic importance.

Prerequisite: Entomology 301. Required in the courses in Pomology, Plant Pathology, and Entomology; elective in other courses; junior year; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period. Fee \$1.00. Text: Sanderson, Insect Pests of Farm, Garden, and Orchard.

303. Entomology of Truck and Field Crops. A course similar to 302, with special emphasis put on the intensive study of the insect enemies of celery, onion, beet, cabbage, kale, clover, vetch, potato, hop, corn, wheat, and oats.

Prerequisite: Entomology 301. Required in the course in Vegetable Gardening; junior or senior year; elective for students in other courses; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period. Fee \$1.00. Text: Sanderson, Insect Pests of Farm, Garden, and Orchard.

304. Forest Entomology. A study of insect injuries to forest trees and forest products, factors influencing their occurrence and the general principles of control work.

The course in Forestry; junior year; second semester; 3 credits. Fee \$1.00. (Course not offered 1918-19.)

305. Forest Entomology. A continuation of course 304.

The course in Forestry; senior year; first semester; 2 credits; hours to be arranged.

Prerequisite: Entomology 304. Fee \$1.00. (Course not offered 1918-19.)

306. Advanced Entomology. This course is designed for those who desire to specialize in Entomology. The instruction includes lectures and reference reading on the biology of the principal families of insects, supplemented by laboratory studies of typical life-histories. Considerable time is devoted to studying the habits of insects, particularly injurious species in the field; to collecting, rearing, mounting, and classifying them; and to becoming familiar with Entomological methods and literature.

Required in the course in Entomology; elective in the courses in Agriculture; junior year; first semester; three credits; one lecture in Agriculture; junior year; first semester; 3 credits; 1 lecture; 2 laboratory periods. Fee \$1.00. Text: Folsom, Entomology with Reference to its Biological and Economic Aspects. (Course not offered 1918-19.)

307. Advanced Entomology. A continuation of course 306.

Required in Entomology; elective in the courses in Agriculture; junior year; second semester; 3 credits; 1 lecture; 2 laboratory periods. Fee \$1.00. (Course not offered 1918-19.)

308. Advanced Entomology. A continuation of courses 306 and 307.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; first semester; 5 credits; 2 lectures; 3 laboratory periods. Fee \$1.00. (Course not offered 1918-19.)

309. Advanced Entomology. A continuation of courses 306, 307, and 308.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; second semester; 5 credits; 2 lectures; 3 laboratory periods. In connection with courses 306, 307, 308, and 309, the student will be required to present a thesis detailing the results of a systematic study of some restricted group of insects, or of the biology of some particular species or group of species. Fee \$1.00. (Course not offered 1918-19.)

310. Household Entomology. A study of insects in their relation to pharmacy and to the household. The history and development of insects in medicine, insects in relation to disease, and insect pests of dwellings and stores. Control methods will be taken up in detail. This course is intended to prepare students in Pharmacy and Home Economics intelligently to understand the bearing of insects upon the household and community, and the principles underlying methods of control.

Primarily for Pharmacy students; open to students in Home Economics and to others by special permission; no prerequisite. Two credits; 2 lecture periods. Fee \$1.00.

311. Beekeeping. A course in the theory and practice of keeping bees for profit and in relation to fertilization of orchard trees. The College has an apiary in which students will be able to become fully acquainted with modern apicultural methods.

Elective in courses in Agriculture and Home Economics; second semester; 1 credit; 1 laboratory period. Fee \$1.00. Text: Phillips, Beekeeping.

312. Problems in Forest Entomology. This course will include the study and application of methods of forest insect investigations. Each student will be assigned a practical problem in Forest Entomology to work out under direction.

Credits to be arranged. Fee \$1.00. (Course not offered in 1918-19.)

313. Problems in Forest Entomology. A continuation of course 312.

Prerequisite: Entomology 312. Credits to be arranged. Fee \$1.00. (Course not offered 1918-19.)

314. Seminar. Senior and graduate students in Entomology. Reading, discussing, and abstracting the leading articles on Entomology as they appear in the scientific journals, horticultural press, current magazines, and experiment station literature.

Senior year; first semester; 1 credit.

315. Seminar. A continuation of course 310.

Senior year; second semester; 1 credit.

316. Insect Taxonomy. An intensive study of the systematic grouping of insects; insect ecology as allied to taxonomy.

Prerequisite: Entomology 301. Elective in advanced entomology and of graduate rank; second semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$2.00.

317. Advanced Thesis and Research Methods. A course offered only for graduate students. Students will select problems in applied entomology on the life-history and control of some insect or group of insects; problems in ecology; monographic problems, etc., with special emphasis on methods of research.

Elective for graduate students only; first semester; from 8 to 16 credits.

318. Advanced Thesis and Research Methods. Continuation of course 317.

Elective for graduate students only; second semester; from 8 to 16 credits.

FARM CROPS

GEORGE ROBERT HYSLOP, Professor
HARRY AUGUST SCHOTH, Scientific Assistant, U. S. Dept.
of Agriculture, Forage Investigations
BERNARD FRANCIS SHEEHAN, Instructor
GRACE COLE, Seed Analyst, U. S. Dept. of Agriculture

This department deals with the various problems of production, improvement, marketing, manufacture, and uses of each of the field crops produced for food, forage, textile, and special purposes.

The purpose of the work is primarily to teach students scientific, practical, and economical methods of crop production and improvement that may be put into actual use on the farm. In addition, the courses are so arranged that men may fit themselves for civil service positions, in agronomy, forage crops, grain standardization, plant breeding, crop marketing, etc., or for experiment station, extension, or teaching work. The object is to turn out men with a broad training on general lines and well finished in Farm Crops.

Considerable flexibility in electives is allowed in order to meet special needs of individual students.

Food shortage and problems of production and distribution have made especially heavy demands for well-trained Farm Crops specialists. The field is a large one and deals principally with well-known and staple crops that are constantly in use and in demand. The work is closely associated with the daily food supply of man and beast, and is of importance to all students of agriculture, whether seeking a salaried position or expecting to engage in the operation or management of a farm.

Equipment. The department has excellent recitation and well-lighted laboratory rooms. The laboratory is equipped with modern desks and tables for crop study. Gas, water, and electricity are available for general use. Special equipment consists of compound and binocular microscopes, dissecting and hand lenses, for study of crop structure and crop products; analytical and torsion balances for accurate weights; seed sampler; standard and Semper's type germinators for seed studies; and large collections of cereal, grass, and miscellaneous straw and seed specimens for class use. Grain testers, a Brown-Duvel moisture tester, a Boerner sampler, standard weight per bushel testers, grain pans, car triers, grain dockage testers, drying ovens, gluten test equipment and collections of standard grain grades, and corn-ear samples, provide excellent facilities for grain standardization and judging work.

The Experiment Station plots offer excellent opportunities for field study and make possible extensive collection of valuable material for class work. In addition to the above, a large collection of the best books, periodicals, etc., dealing with the subject, is available.

The Oregon Agricultural College is probably the best equipped institution on the Coast for grain grading and inspection work. Numerous graduates of regular and special courses have already engaged in federal and state work.

COURSE IN FARM CROPS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Plant Chemistry (Chem. 510) or.....		2
Plant Physiology (Bot. 50).....		3
Agricultural Bacteriology (Bact. 501).....	3	
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Field Crops (Bot. 105).....	1	
Introductory Entomology (Ento. 301).....	2	
Cereal Crops (Farm Crops 57).....	4	
Land Drainage (Soils 103).....		3
Crop Improvement (Farm Crops 15).....		3
Soil Physics (Soils 5).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Elective		3 or 4
	<hr/> 17	<hr/> 17

	Senior Year	Semester	
		1st	2nd
National Government (Com. 320).....		3	
State and Municipal Government (Com. 322).....			3
Agrostology (Farm Crops 11).....			3
Forage Crops (Farm Crops 9).....		2	
Soil Fertility (Soils 7).....		3	
Farm Management (Farm Mgt. 1).....			3
Advanced Crop Breeding (Farm Crops 17).....		2	
Crop Efficiency (Farm Crops 22).....			3
Feeds and Feeding (A. H. 23).....			3
Potato Growing (Farm Crops 13).....		1	
Elective		5	1
		16	16

The following courses are offered:

1. Crop Production. Lectures and recitations on description, adaptability, seed-bed preparation; selection, storage, treatment, testing, and planting of seed; cultural methods; habits of growth; harvest, preservation, storage, marketing, rotation, production costs, and uses of the leading cereal, forage, and special field crops. The eradication of weeds. Laboratory work consists of studies of purity and germination of seed, methods of testing, seed cleaning, and seed treatment, corn and seed judging. Practical work consists of studying crop problems in the field on the College farm.

A general course outlining foundation principles of production and disposal of crops.

Agriculture; freshman year; either semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.75.

5. Cereal Crops. A study of the production, standardization, and marketing of cereal and allied grains from seed to consumer. Especial attention is given to varieties, their distribution and adaptability, methods and conditions for production, quality as affected by environment, markets, manufacture, and uses of wheat, oats, corn, rye, and less important cereals, and their enemies and control. Laboratory work consists of studies of varieties, their identification before and after threshing, cereal judging, grain standardization, moisture and gluten and hardness testing, conditions affecting germination, weight per bushel, etc. Suited to cereal

specialists, grain growers, and those desiring civil service work in agronomy, grain investigations, grain supervision and inspection work and for operators of country elevators and warehouses.

Agriculture; junior year; first semester; 2 or 4 credits; 2 recitations; 2 laboratory periods. Fee \$0.75. Texts: Carleton, Small Grains. Montgomery, The Corn Crops.

9. Forage Crops. A study of legumes, grasses, and succulent crops adapted to the work of students in agriculture. Temporary pasturing systems, seeding, care, and maintenance of permanent pasture; reseeding and care of range. Adaptability, culture, methods of handling, and value of various crops for forage. Silage and hay making. Soiling crop rotations. Costs, storage and marketing.

Agriculture; junior or senior year; first semester; 2 credits; 2 recitations. Fee \$0.75. Text: Piper, Forage Crops.

11. Agrostology. A study of the grasses, legumes, and other forage and seed crops. Methods of seeding, production, harvesting, and marketing of meadow, pasture, cover, and special crops for seed, fiber, and special purposes other than forage. The comparative structure and identification of the different forage plants, their adaptability to different conditions of soil and climate. Examinations of commercial seed for viability and purity. The identification of weed seed. The production of forage-crop seed. This course with Forage Crops, Farm Crops 9, fits persons for forage and seed specialization.

Agriculture; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.75. Texts: Piper, Forage Plants. Hitchcock, A Textbook of Grasses.

13. Potato Growing. A detailed study of potato soils, fertilization, culture, harvest, improvement, storage, costs, markets, distribution, uses, and manufacture. Varietal studies and identification. Potato judging and scoring.

Agriculture; senior year; first semester; 1 credit; 1 recitation. Fee \$0.75.

15. Crop Improvement. Studies of practical means of improving farm crops in quality and yield; field selection; mechanical and score-card methods of seed selection; variety testing; head and ear-to-row methods; multiplication; and pure-seed production. Hybridization and plant-breeding laws applicable to practical crop

improvement. Laboratory and field work consists of studies of transmission of characters, field selection, planning and planting of plots, hybridization methods, etc.

Agriculture; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.75.

17. Advanced Crop Breeding. An advanced course dealing with field-crop breeding from a more technical view point. Hybridization, variability, and its measurement. Transmission of characters. Behavior of characters of specific crops. A course designed for students desiring to enter plant-breeding work.

Agriculture; senior year; first semester; 2 credits; 2 recitations.

19. Seed Testing. A course for students preparing themselves for private, state, or government seed-testing work. Studies are made of seed identification and germination, seed legislation, and standard methods of seed testing.

Prerequisite or companion course: Agrostology (Farm Crops 11), Agriculture, Domestic Science, or Commerce; senior year; first or second semester; 2 credits; 2 laboratory periods. Fee \$0.75.

21. Weed Eradication. This course deals with weed types and habits of growth, weed laws, and the various practical methods of prevention, control, and eradication. Special attention is paid to noxious, persistent, perennial, and poisonous weeds of ranch and range.

Agriculture; junior or senior year; first semester; 1 credit; 1 recitation.

22. Crop Efficiency. The efficient production, handling, storage, and marketing of farm crops. A course dealing with a comparison of methods leading to cheaper and more efficient production: Analysis of net results; crop adaptability and its relation to substitutes and competing markets. Relation of preparatory methods to returns: sequence of crops as it affects yield, quality, and profits of succeeding crops. Organization and operation of cropping systems and crop rotations. Flexible cropping systems, crop specialization, extremes and fads, amendments as they affect yield, quality, and profits for specific crops. Systems of crop storage, handling, and use on farm and for market. Grade and standard fixation, making the most of grades and market customs. Factors determining when to sell. State, national, and international regulations dealing with transportation, inspection, and marketing of

farm crops. Export and import regulations. Preparation of crops for shipment, loading cars, weather data, and protection of shipments, crop statistics, their value and use. Disposal of crop by-products and other problems affecting successful crop production.

Required of Farm Crops seniors. Elective agricultural seniors; second semester; 3 credits; 3 recitations. Fee \$0.75.

23. Advanced Crop Work. Lectures or laboratory work or both will be offered to groups of students desiring additional work in various lines of crop production. Suggested topics are sugar beets, hops, flax, seed testing, grain standardization, grain grading, experimental methods, etc. Individual students desiring special work will be assigned to some practical problem involving experimental or research work and the preparation of a thesis.

Agriculture; senior year; either semester; 1 to 5 credits. Fee to be arranged.

24. Advanced Crop Work. Continuation of course 23 for students who wish to elect two semesters of this advanced work.

Agriculture; senior or graduate year; either semester; 1 to 5 credits. Fee to be arranged.

Graduate Work. Candidates for advanced degrees majoring in Farm Crops will be assigned some specific problem of a practical nature requiring careful original work. Result of laboratory and field work, together with a review of the literature of the subject, must be embodied in a suitable thesis.

Agriculture; graduate year; either semester or both; credits and fees to be arranged.

B. General Farm Crops. I. Principles of crop production, breeding, and improvement; crop adaptability; crop rotations for economical production; seed care, selection, and testing; seed-bed preparation; seed treatment, seeding, culture; harvest methods for seed crops, beans, and cereals. Grain and seed handling, storage, grading, marketing; first semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.75.

C. General Farm Crops II. Forage, cover, and special crops; pasture and soiling systems; rotation, seeding, culture, care, harvest, and storage of forage crops, roots and potatoes; hay making, stacking, baling, marketing; silage making; root and potato storage and potato grading; culture and use of cover crops; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.75.

FARM MANAGEMENT

HENRY DESBOROUGH SCUDDER, Professor

REUBEN GUNN, Assistant Professor (Ext.)

CLAIR WILKES, Assistant
Fellow

No matter how expert the student may become in the various lines of agricultural production, his success as a farmer is not assured unless the organization and management of his farm as a whole, as a profitable business enterprise, is capably done.

The course in Farm Management is designed especially: first, to give the student a broad, well-rounded training in all the phases of agriculture that will prepare him for successful production, but with emphasis laid upon those studies which will fit him best for successful management of the farm; second, to prepare students for positions as managers of private, state, or federal farms; as county agriculturists; agricultural extension specialists; federal farm appraisers; specialists in marketing; or for investigational work in state college, experiment station, and federal service.

Equipment. The department has a specially equipped farm management laboratory and seminar room, provided with drafting tables and instruments, surveying instruments, original data and record sheets, lantern slides and charts, and a complete periodical and bulletin reference library. Investigational work carried on in many different parts of the state offers the advanced student excellent opportunities for field work.

COURSE IN FARM MANAGEMENT

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80. For students desiring to major in Farm Management the following course is recommended for the junior and senior years. Since different students have different needs, the course outlined below is not rigidly required except for the Farm Management, Soils, Farm Crops, Animal Husbandry, and Economics courses named. Those preferring to minor more strongly in some one subject may do so through arrangement with the department.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Forage Crops (Farm Crops 9).....	2	
Cereal Crops, Lectures (Farm Crops 7).....	2	
Typewriting (Com. 210-a).....	1	
Practical Pomology (Hort. 102).....	2	
General Farm Mechanics (Farm Mech. 1).....	2	
Irrigation Farming (Soils 105).....	3	
Farm Management (Farm Mgt. 1).....		3
Farm Management Seminar (Farm Mgt. 8).....		1
Soil Physics (Soils 5).....		3
Farm Power Machinery (Farm Mech. 3) or Land Drain- age (Soils 103).....		3
Diseases of Live Stock (Vet. Med. 14).....		3
Technical English (Eng. 141).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Farm Management Field Course (Farm Mgt. 5) 5 cred- its summer.	—	—
	17	17

Senior Year

Soil Fertility (Soils 9).....	3	
Introductory Entomology (Ento. 301).....	2	
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Field Crops (Bot. 105).....	1	
Economic Organization of Agriculture (Com. 264).....	3	
Advanced Farm Management (Farm Mgt. 7).....	2	3
Farm Management Seminar (Farm Mgt. 9).....		1
Soil Surveying (Soils 13).....		2
Dairy Herd Management (D. H. 2).....		3
Feeds and Feeding (A. H. 23).....		3
Extempore Speaking (Eng. 104).....		2
Approved Electives	3	2
	—	—
	16	16

1. **Farm Management.** Farm Management deals with the organization and management of the farm as a business enterprise. It concerns itself especially with those factors which affect the labor income. The chief subjects covered in this course are: types of farming, selection and purchase of the farm, requirements as to

capital investment and distribution, size and diversity of business, farm rental and leasing methods, management of man and horse labor, farm-equipment costs and duty, cropping systems on different types, maintenance of soil-fertility as a farm-management problem, farm-equipment costs and duty, cropping systems for different systems of farming, farm and farmstead layout and building arrangements, production costs, marketing in relation to farm management, the study of successful and unsuccessful farms. Whenever possible, short field trips are taken. Students desiring to strengthen their work in this course or wishing to work out a home farm-management problem, may do so by taking laboratory work to accompany it, registering in Advanced Farm Management (Farm Management 7), for this purpose.

Elective; junior or senior year; second semester; 3 credits; 3 lectures. Fee \$1.00.

3. Semi-Arid Farm Management. A study of the farm-management problems of the dry farmer and irrigation farmer, and the preparation of management plans dealing with fertility, rotations, equipment, labor distribution, forms of production, marketing, etc., as adapted to semi-arid conditions. When circumstances permit, a field excursion into the dry farming and irrigated sections of Oregon for farm survey work, will be made.

Prerequisite: Farm Management 1. Elective; senior year; first semester; 1 credit; 1 lecture. Fee \$0.50.

5. Farm Management Field Course. A course for students specializing in Farm Management. The object of the course is two-fold: first, to increase the student's knowledge of the practical application of the principles of Farm Management, through direct study and analysis, in the field, of some of the most successful farms in the State; second, to give the student training in regular farm-management survey work.

In the summer of the junior year, following the close of the College in June, the group of students registered in this course, accompanied by the instructor, spends four or five weeks in the field in various representative sections of the State, devoting about one week to each section. All of the time during the day is spent in the company of the farm owner in the study of his individual farm and its methods, a complete record being taken, and in the evenings this record is analyzed.

In order to reduce expense and increase the efficiency of the work, camp equipment is provided and field camp maintained throughout the period, the student paying only his living and traveling expenses.

Prerequisite: Farm Management 1. Elective; junior year; 5 credits; field work.

7. Advanced Farm Management. In this course students in Agriculture who have taken or are taking the lecture work in Farm Management 1 are offered opportunity to do laboratory or field work, applying the principles of the subject in working out problems in which they are especially interested, such as those connected with the home farm or home region or a future farm under certain known conditions. Working out detailed re-organization plans for farms in different parts of the State, is a feature of the course.

Students specializing in Farm Management will register in this course for laboratory and field work as indicated above but on a more extensive scale and with wider range, including advanced reading in the literature of the subject.

Elective; junior year, second semester; or senior year, either semester; 1 to 5 credits. Fee \$0.50.

8. Seminar. A course for all junior, senior, and graduate students majoring in Farm Management. Discussion of investigational methods, analysis of data, new literature, special problems, etc., with programs of outside speakers, successful farmers and the like. The class is organized and conducted by the students as their technical association in Farm Management.

Required of all majors in Farm Management; junior year; second semester; 1 credit; fortnightly meetings.

9. Seminar. Same as Farm Management 8.

Required of all majors in Farm Management; senior or graduate year; second semester; 1 credit; fortnightly meetings.

11. Accredited Farm Work. The object of this course is to offer opportunity for the furtherance of the student's training in Farm Management through a period of actual experience obtained on a highly developed farm where the practical application of the principles of good management are in successful operation. Advanced or graduate students who have taken the regular four-years course in Farm Management or its equivalent and who have previous good records of practical experience in farming and the necessary personal qualifications as to character, industry, etc.,

may register in this course. Such students will be assisted to secure places as workmen on "accredited" farms — farms operated by progressive and successful farmers — known to the College as following the best practices in production and management. In addition to gaining actual experience, the student will be required to study the organization, management, methods, costs of production, methods of solution of special problems, etc., on this farm, and make written report upon the same and where advisable, prepare re-organization plans. He will be visited and his work inspected by the instructor and reported upon by the farm owner. The College credit given the student for a year on such a farm will depend upon the quality of his practical work and the extent and quality of his study of organization and management as evidenced in his written reports.

Senior or graduate year; 8 to 16 credits. Fee \$1.00.

13. Graduate Work. Under this head all graduate work in Farm Management is registered. Graduate work in this field divides itself into the two phases indicated below. Selection should be made according to the work the student desires to prepare himself for.

a. Research. For the student who wishes to prepare himself for investigational and instructional or extension work in Farm Management. With the development of Farm Management throughout the country as a distinct science or branch of agriculture, opportunities are opening up for men in either instructional or investigational or extension work in both state and federal service. Problems of wide diversity are available for thesis subjects, ranging from the reorganization and preparation of management plans for unsuccessful farms to the study of efficiency factors in special regions, such as on dry-land or irrigated areas, on marsh or diked lands, on drainage reclamation areas, on distinct soil types, etc. Field studies in cost of production; farm management surveys in selected areas or on special types of farming, etc. The minor courses required in connection with research problems are taken in residence one or both semesters and the major work in residence or in the field.

b. Practical Management. For the student who wishes to prepare himself more thoroughly as a farm manager, one year registered in the course Accredited Farm Work (Farm Management 11) combined with one semester's work in residence graduate work, is suggested.

Elective; graduate year; either semester; credits to be arranged.

14. Graduate Work. Continuation of course 13 through the second semester's work.

Elective; graduate year; either semester; credits to be arranged.

A. Practical Farm Management. The chief factors bearing on successful farming, such as the type of farming, size of business, use of capital, handling of labor, proper equipment, cropping systems, marketing, etc., are given consideration from the practical standpoint. The laboratory work deals with the solution of the home-farm problems.

Vocational course; first semester; 2 credits; 2 recitations; 1-hour laboratory period. Fee \$0.50.

B. Farm Planning and Organization. The practical application of the principles learned in the preceding course, to the planning or re-planning of the student's home farm or an assigned farm. These organization plans include not only the selection of the most profitable industries and the laying out of the farm and farmstead to give maximum efficiency in operation, but also provide in detail the development programs of the farm as to improvements, equipment, live-stock production, cropping plan, fertility, labor and financial programs, etc.

Vocational course; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

FARM MECHANICS

WILLIAM JAMES GILMORE, Professor
Instructor

The purpose and scope of the work in Farm Mechanics is indicated fully in the description of courses given below.

Equipment. The Farm Mechanics building is complete for Farm Mechanics work. It is an attractive, well-lighted, brick building, having a large operating floor, a class room, locker room, shop and tool rooms on the first floor. The operating room is used for displaying the heavier farm machines and for indoor operation of tractors and automobiles. A gallery surrounds this operating floor and provides space for the lighter farm machines, such as tillage, haying, and harvesting machines, and manure spreaders, many of which are operated from a line shaft.

A very large equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest, so that the student has constantly before him and is working with and studying the very best farm machines of all types. Plows, harrows, pulverizers, rollers, cultivators, corn planters, potato planters and diggers, grain and grass seeders, mowers, rakes, hay loaders, corn and grain binders, sprayers and manure spreaders, ensilage cutters, hay balers, and threshing machines, are representative machines found in the laboratory. The large, well-lighted gas-engine laboratory contains many different makes of gas engines and accessories, such as sectional carburetors, magnetos, and lubricators. In addition to this equipment is the large selection of grain-cleaning and crushing machines, farm-lighting plants, pumps, rams, and water-supply equipment.

The laboratory is also equipped with two large brakes for the testing of tractors; dynamometers for determining the draft of the field machines and the draw-bar horse power of tractors, and also a gas and steam indicator for determining the efficiency of farm engines and tractors; and an electric motor and watt meter, so that the student may become familiar with the power requirements of belt-driven farm machines.

COURSES IN FARM MECHANICS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
Senior Year		
	17	17
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
*Electives	13	13
	—	—
	16	16

The following courses are offered:

1. General Farm Mechanics. Concrete construction on the farm, farm water supply, detailed and comparative study of field machines, assembling and adjusting field machines, crushing and cleaning machinery, threshing machinery, heating farm homes, power requirements of belt-driven machines, field tests showing draft and effects of mis-adjustments in field machines, farm fences, selection and care and adjustments of farm machines, demonstrations of tractor for field operations, farm gas and electric lighting.

Optional; sophomore year; either semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.50. Deposit \$1.00. Text: Equipment for Farm and Farmstead.

3. Farm Power Machinery. Principle, construction, operation, adjustment, and repair of farm power machines. Study of carburetors, ignition, governing, and cooling systems, lubricants, and lubrication. Testing, adjusting, and trouble hunting. Detail study and power requirements of belt-driven machines, such as crushers, ensilage cutters, etc. Pumping machinery and hydraulic ram. Pipe fitting, babbitting, soldering, belt lacing, and valve grinding.

Either semester; 1 or 3 credits; 1 recitation; 2 laboratory periods.

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

Fee \$2.00. Deposit \$1.00. Text: The Gasoline Automobile.

5. Farm Motors and Tractors. Detail study and operation of the gas, steam, and electric motor, including the stationary gas and steam engine, tractors, trucks, and automobile. Valve setting on steam engines; flue repair. Electricity in its adaptation to farm uses. Indicated, brake, and drawbar horse-power tests of tractors.

Prerequisite: Farm Mechanics 3. Either semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$2.00. Deposit \$1.00.

7. Dairy Mechanics. Concrete floors and sidewalks, concrete bases for machines, detailed study of gas engine operation; trouble hunting and tests of gas engine; gas engine accessories; study of pumps, steam boilers, and steam engines; firing and operating steam engines; lubricators; injectors; magnetos; flue repair.

Elective; junior or senior year; either semester; 3 credits; 1 lecture; 2 laboratory periods. Fee \$1.00. Deposit \$1.00.

9. Orchard Machinery. Given to Horticultural students from the mechanical standpoint, and includes study of construction, operation, and efficiency of orchard machinery, such as gas engines, pumps, tillage, and seeding implements. Orchard plowing and cultivation. Demonstration of tractor for orchard work. This course is intended only for students who cannot take the regular courses in Farm Mechanics.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods. Fee \$1.50. Deposit \$1.00.

13. Advanced Farm Mechanics. For students who have inclinations toward mechanics and who feel that more work is needed than was obtained in courses 1, 3, and 5. This course includes efficiency tests of gas and steam tractors (indicated, brake, and drawbar), plowing with tractors, power requirement tests of belt-driven machines with electric motor and watt meter, automobile study and operation, magnetos, self-starters, farm lighting, concrete construction, binder adjustments, dynamometer tests of various field machines.

Prerequisites: Farm Mechanics 1, 3, and 5. Elective; senior or graduate year; either semester; 1 or 2 credits. Fee \$2.00. Deposit \$1.00.

14. Advanced Farm Mechanics. Continuation of course 13 for students who wish to take the second semester of this advanced work.

Elective; senior or graduate year; either semester; 1 or 2 credits.

15. Concrete Construction and Farm Machines. A special course designed to meet the requirements of the Industrial Arts students who expect to teach Farm Mechanics, Farm and Ornamental Concrete Construction; detail study, operation, trouble hunting, and testing, gas engines; gas and steam engine accessories; exercises with the common farm machines and such exercises as babbitting, belt lacing, and rope tying and splicing will be given.

Elective; junior or senior year, Industrial Arts; one semester; three credits. Fee \$2.00.

A. Farm Machines and Engines. A general course in Farm Mechanics. The more important field machines and gasoline engines are studied. Farm buildings, concrete work, rope work, etc., are also given attention.

Vocational course; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.50. Deposit \$1.00.

HORTICULTURE

CLAUDE ISAAC LEWIS, Professor
VICTOR RAY GARDNER, Professor of Pomology
EZRA JACOB KRAUS, Professor of Research
ARTHUR LEE PECK, Professor of Landscape Gardening
ARTHUR GEORGE BOUQUET, Professor of Olericulture
WALTER SHELDON BROWN, Assistant Professor (Ext.)
LESTER LINGLE, Assistant Professor of Horticultural Products
FRANK EARL DENNY, Research Assistant
ALDEN FORREST BARSS, Instructor
* HARRY DUANE LOCKLIN, Instructor
LEWIS TAYLOR BUCHMAN, Teaching Fellow
OLIVER HAMM, Gardener

The scope of the work in Horticulture is very broad, giving instruction in Pomology, Olericulture, Floriculture, Landscape Gardening, School Gardening. In these courses the student is first thoroughly grounded in the fundamentals, and is then allowed to specialize as he may desire. He may thus fit himself for station or government work, or prepare for the many lines in horticultural business, such as fruit growing, truck gardening, floriculture, or landscape gardening.

The required work for students electing horticulture covers a wide range, giving the student a thorough training, not only in plant propagation and the general principles of orchard management and vegetable growing, but in floriculture and landscape gardening as well, thus broadening his views and interesting him in the aesthetic and all that pertains to more beautiful surroundings.

The courses consist of lectures, reference reading, field exercises, and laboratory work. Much stress is placed upon the practical phases of all the work. In all courses horticultural truths are illustrated by practice, whenever possible. Students are given field and laboratory exercises in all such operations as planting, seeding, budding, grafting, cultivating, thinning, pruning, harvesting, and spraying.

The Horticultural Building contains modern laboratories for spraying, plant propagation, fruit packing, systematic pomology, and vegetable preparation. There are special class rooms, large draughting rooms, museum, and greenhouses. The department is also establishing young orchards and vegetable gardens, and has at its disposal a large campus upon which are planted many species of trees and shrubs. The student is materially assisted in all of his

* On leave of absence.

work, and the research work especially, by the excellent horticultural library.

Equipment. The Horticultural wing of the Agricultural building contains many spacious rooms, and thoroughly modern equipment for teaching the various subjects. In the basement will be found a large spray laboratory furnished with gas and water and all the equipment, chemicals, and apparatus which are necessary to teach students the proper mixing and testing of the different sprays; accommodations are offered also for the testing of nozzles and spraying apparatus. The department has a large number of hand and power spraying outfits that are placed at the disposal of students.

A large, well-lighted plant-propagation laboratory offers unexcelled opportunities for the study of plant propagation. Specially equipped cabinets, tables, and incubators have been constructed; so that the students can study to advantage such topics as seedage, layerage, making of cuttings, and budding and grafting.

A laboratory has been especially fitted for the use of students in gardening. It contains large cement-set tubs, where students are taught the proper methods of preparing vegetables for market. This room also contains a demonstration earth bed for use during the winter, to show how the various tools for planting seed and for cultivation are used. The demonstration bed also allows the instructor to demonstrate the proper method of interplanting and transplanting of plants.

In the basement is also located a very large fruit-packing laboratory, equipped with box presses, grading machinery, and packing tables. The large storage rooms are also located in the basement and include a suite of rooms which are chilled by mechanical refrigeration.

On the first floor a systematic pomology laboratory is especially equipped for the study of nuts, fruits, etc. A special research laboratory, located on this floor, is used for research assistants in the department, and is also at the disposal of advanced students. This room is completely equipped with ovens, microscopes, and other apparatus necessary for extensive research work.

On the top floor, in the horticultural museum, are exhibited all sorts of equipment used in Horticulture, such as pruning shears, budding and grafting utensils, prune-drying apparatus, fruit graders, etc. On this floor a large draughting room extends along the entire south end of the building, fully supplied with tables,

cabinets, etc., for the use of students studying Floriculture, Landscape Gardening, Greenhouse Construction, Orchard Planting, and Packing House Construction. In addition to these rooms, the department has four large lecture rooms. A balopticon with a good collection of lantern slides, and a large library, add materially to the equipment.

The department is also well provided with tools and apparatus necessary for conducting field exercises in Truck Gardening, Floriculture, Landscape Gardening, and Pomology.

COURSES IN HORTICULTURE

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

(a) Pomology

Semester

Junior Year

1st 2nd

Agricultural Economics (Com. 219).....	3	
Floriculture (Hort. 401).....	2	
Landscape Gardening (Hort. 301).....		2
Plant Propagation (Hort. 105).....		2
Practical Pomology (Hort. 102).....	2	
Orchard Practice (Hort. 103, 104).....	2	2
Plant Physiology (Bot. 50).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	6	6

Senior Year

17 17

National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Systematic Pomology (Hort. 115).....	4	
Commercial Pomology (Hort. 117).....		3
Introductory Entomology (Ento. 301).....	2	
Entomology of Orchard and Small Fruits (Ento. 302).....		2
History and Literature of Horticulture (Hort. 125).....		2
Seminar (Hort. 123, 124).....	1	1
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Orchards and Small Fruits (Bot. 102).....		2
Approved Electives	5	4
	17	17

(b) Olericulture

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Plant Propagation (Hort. 105).....		2
Practical Vegetable Gardening (Hort. 203, 204).....	3	3
Floriculture (Hort. 401).....	2	
Landscape Gardening (Hort. 301).....		2
Introductory Entomology (Ento. 301).....	2	
Entomology of Truck and Field Crops (Ento. 303).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	5	5
	—	—
	17	17

Senior Year

National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Commercial Truck Gardening (Hort. 209, 210).....	3	3
Forcing Vegetables (Hort. 205, 206).....	2	2
Systematic Olericulture (Hort. 207).....	1	
Seminar (Hort. 123, 124).....	1	1
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Vegetable Crops (Bot. 104).....		2
Approved Electives	4	5
	—	—
	16	16

(c) Floriculture

Junior Year		
Agricultural Economics (Com. 219).....	3	
Floriculture (Hort. 401).....	2	
Landscape Gardening (Hort. 301).....		2
Plant Materials (Hort. 305, 306).....	3	3
Greenhouse Construction (Hort. 403).....		3
Introductory Entomology (Ento. 301).....	2	
Entomology of Truck and Field Crops (Ento. 303).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	4	4
	—	—
	17	17

	Semester	
	1st	2nd
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Forcing Flowers (Hort. 405, 406).....	3	3
Agricultural Bacteriology (Bact. 501).....	3	
Forcing Vegetables (Hort. 205, 206).....	2	2
Advanced Plant Breeding (Hort. 127, 128).....	3	3
Diseases of Vegetable Crops (Bot. 104).....		2
Approved Electives	2	3

(d) Landscape Gardening

16 16

Freshman Year

Modern English Prose (Eng. 81, 82).....	3	3
Plane Surveying (C. E. 222).....		5
Modern Language (French, German, or Spanish, first Yr.)	3	3
Agricultural Botany (Bot. 41, 42).....	3	3
Trigonometry (Math. 11).....	3	
Architectural Drawing (Arch. 601).....	3	
Drill (Military 1, 2).....	1	1
Library Practice (Libr. 1).....		$\frac{1}{2}$
Hygiene (Phys. Ed. 10).....		$\frac{1}{2}$
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Approved Elective	1	1

Sophomore Year17 $\frac{1}{2}$ 17 $\frac{1}{2}$

American Literature (Eng. 71, 72).....	3	3
Modern Language (French, German, or Spanish, second Yr.)	3	3
Topographic Surveying (C. E. 223).....	5	
Railroad and Canal Surveying (C. E. 272).....		5
Principles of Fruit Growing (Hort. 101-a).....	2	
Fundamentals of Land. Gard. (Hort. 101-b).....	1 $\frac{1}{2}$	
Landscape Gardening (Hort. 301).....		2
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Approved Electives	3	4

18 $\frac{1}{2}$ 18 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Composition of Addresses (Eng. 103, 104).....	2	2
Water Color Rendering (Arch. 505, 506).....	2	2
Floriculture (Hort. 401).....	2	
Plant Materials (Hort. 305, 306).....	3	3
Hist. and Lit. of Landscape Architecture (Hort. 311).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	3	6
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Theory and Design (Hort. 307, 308).....	2	3
Town Planning (Hort. 313).....	3	
Field Practice (Hort. 309, 310).....	3	3
Approved Electives	5	7
	—	—
	16	16

It is suggested that four of the elective credits in sophomore year be taken in Architectural drawing and Perspective, such as Arch. 602, Arch. 518.

The following courses are offered:

101-a. Principles of Fruit Growing. This includes the problems incident to the establishing of an orchard. It embraces a consideration of such questions as locations, site, soils, windbreaks, variety selection, selection of nursery stock, and planting. Some attention is also given to problems incident to maintenance, especially the maintenance of the home orchard. It is designed especially for general agricultural students, who are interested mainly in the orchard as an accessory of the general farm. At the same time, it is a fundamental course for students desiring to pursue other horticultural studies.

Required of all Agricultural students; sophomore year; 2 credits; 3 recitations; 1 laboratory period. Fee \$1.50. Text: Sears, Productive Orchardng.

101-b. Fundamentals of Landscape Gardening. This course consists of a series of lectures and practicums dealing with the beautifying of the farm home and rural public buildings. It begins

after the Christmas holidays and extends to the end of the second week in March. Registration for the course should be arranged in September.

Required of all Agricultural students; sophomore year; $1\frac{1}{2}$ credits; for the remainder of the first semester, 3 recitations and 1 laboratory period; for the first part of the second semester, 1 lecture and 1 laboratory period. Text: Sears, Productive Orchard-ing.

Pomology

102. Practical Pomology. A continuation of course 101-a. It deals especially with the problems incident to the maintenance of the commercial orchard, including a study of such questions as cover crops, fertilization, irrigation, frost occurrence and prevention, pollination, pruning, thinning, spraying, and spray injury.

Required of students majoring in Pomology; junior year; first semester 2 credits; 3 recitations. Text: Bailey, The Pruning Book.

103. Orchard Practice. A laboratory course in which the student obtains actual practice in regular orchard and packing-house operations. The work includes tree planting, pruning, the preparation of spray solutions, a study of spray machinery, orchard spraying, orchard heating, and the picking, grading, packing, and judging of fruits.

This course is open only to those who have taken or are taking course 102.

Required of juniors majoring in Pomology; junior year; first semester; $1\frac{1}{2}$ credits; 1 laboratory period of four hours scheduled for Saturday forenoons. Fee \$1.00.

104. Orchard Practice. A continuation of course 103.

Required of juniors majoring in Pomology; junior year; second semester; $1\frac{1}{2}$ credits; 1 laboratory period of four hours scheduled for Saturday forenoons. Fee \$1.00.

105. Plant Propagation. A study of the propagation of plants by means of seeds, separation, division, layerage, cuttage, and graftage. Sufficient attention is given the subject of nursery management to acquaint the student with its more important features.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

109. Viticulture. A study of the problems pertaining to the growing, harvesting, and marketing of both the American and European types of grapes. Soils, locations, pruning, training,

harvesting, grading, packing, storage, etc., are some of the questions receiving attention.

Elective; open to juniors and seniors; second semester; alternate years; (not given in 1918); 2 credits; 2 recitations.

111. Small Fruit Culture. A study is made of the problems connected with the growing, harvesting, and marketing of such fruits as the strawberry, currant, gooseberry, raspberry, blackberry, Loganberry, and cranberry.

Elective; open to juniors and seniors; second semester; 2 credits; 2 recitations.

113. Nut Culture. A study of the methods of growing, harvesting, curing, and marketing of such nut crops as the walnut, filbert, almond, and pecan. In the laboratory a detailed study is made of the leading varieties of these different nuts.

Elective; open to juniors and seniors; second semester; alternate years (to be given in 1918); 2 credits; 1 recitation; 1 laboratory period.

115. Systematic Pomology. A study of the principles underlying pomological nomenclature and variety description, classification, and adaptation. A critical study is made of many varieties of fruits, of the influence of environment upon behavior of fruit trees and the development of their products. The student becomes acquainted with the more important fruit groups and their interrelationships.

Required of seniors majoring in Pomology; senior year; first semester; 4 credits; 2 recitations; 3 laboratory periods. Fee \$3.00.

117. Commercial Pomology. The problems of handling fruit, including the picking and grading and packing of fruits; a study of the problems of transportation, storage, distribution, and marketing. Considerable attention will also be given to the planning of buildings for the packing and storing of fruit.

Required of seniors electing Pomology as a major; senior year; second semester; 3 credits; 3 recitations.

119. Sub-Tropical Pomology. This course takes up in detail the problems concerned with the growing and marketing of such sub-tropical fruits as oranges, figs, olives, pineapples, etc.

Elective; senior year; first semester; 2 credits; 2 recitations.

121. Advanced Pomology. A finishing course in pomology. The students will first be given a general review to determine their knowledge of pomology. The course is designed especially to fit students for Civil Service examinations. The latter part of the

course will be devoted to the study of some advanced problems in pomology, and will also include a study of orchard costs and economics, the cost of production, and marketing.

Elective; senior year; second semester; 3 credits; 3 recitations.

123. Seminar. A course especially arranged for senior and graduate students in Horticulture. A study is made of some of the advanced problems. Articles from the leading magazines on horticultural subjects, as well as station and Government publications, are reviewed.

Elective for Agricultural seniors; required for advanced students having their major in Horticulture; senior year; first semester; 1 credit; 1 two-hours recitation.

124. Seminar. Continuation of course 123.

Prerequisite: Course 123; elective for seniors electing Horticulture as a major; senior year; second semester; 1 credit; 1 two-hours recitation.

125. History and Literature of Horticulture. A study is made of the literature and history of Horticulture from the time of the Egyptians to modern times.

Required of seniors electing Pomology as a major; senior year; second semester; 2 credits; 2 recitations.

126. Advanced Orchard Practice. This course will deal with problems of pruning, spraying, budding, and grafting. It will consist entirely of field work or laboratory exercises. Work will be conducted not only at Corvallis, but in various other sections of the State. The course is especially offered for those students who have had regular orchard-practice work, and who have the qualifications to enable them to secure benefit from the course.

Students can only be registered by appointment with the head of the department. Schedule by arrangement in four-hour periods on Saturdays. Work will commence January 1, and extend to May 1.

2 credits; 1 laboratory period.

127. Plant Breeding. The principles of breeding. A study of some of the facts pertaining to variation, classification of variations, causes of variation, and the theories that have been advanced to explain the inheritance of characters. The class-room work will consist of lectures, reference readings, and recitations; the laboratory work will acquaint the student with statistical methods of studying variation; and through greenhouse experiments

he will become acquainted with some of the ways in which environment influences plant growth.

Elective; open to seniors and graduate students (and to juniors by special permission); first semester; 3 credits; 3 recitations; 1 laboratory period. Fee \$1.00. Text: Davenport, Principles of Breeding.

128. Plant Breeding. A continuation of course 127. A study of breeding systems and recent breeding work. For the laboratory work, each student will be assigned to some problem that will give him a knowledge of the technique involved in plant breeding studies, and of the methods that are employed in plant breeding investigations.

Elective; open to seniors and graduate students (or to juniors by special permission); second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Davenport, Principles of Breeding.

Vegetable Gardening

Students taking their major in this course are required to take Horticulture 301 and 401.

201. Vegetable Growing. This course is offered for the purpose of teaching the student the value of a well-conducted farm or home vegetable garden, serving especially those students who cannot further pursue a horticultural course. At the same time, the work will be fundamental in the instruction of higher courses in commercial vegetable growing and marketing, for those students who desire to pursue work in this branch of Horticulture.

Required; sophomore year; second semester; 1½ credits; 1 lecture; 1 laboratory period. Work begins the third week in March. Registration should be arranged at opening of second semester. Fee \$0.50. Text: Lloyd, Productive Vegetable Gardening.

203. Practical Vegetable Gardening. This course is offered to those students wishing to learn the fundamentals of the business of vegetable gardening. The practices of the leading commercial growers in all phases of field management will be studied, including such problems as vegetable soils, locations, production of plants, distribution of crops, successions, rotations, manures and fertilizers, irrigation, implements, capital, labor, and other vital factors in the management of a commercial vegetable farm.

Required of juniors electing Vegetable Gardening as a major; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

204. Practical Vegetable Gardening. A continuation of the above course, designed especially for those who are specializing in vegetable growing. Course 204 offers work dealing with the methods used in the commercial production of vegetables for market, consisting largely of practicums in field and greenhouse so as thoroughly to acquaint the student with proper methods and management. The commercial testing grounds, trips to vegetable farms, and the College greenhouses give ample opportunities for the student to fit himself for later commercial work.

Required of juniors electing Vegetable Gardening as a major; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Text: Corbett, Garden Farming.

205. Forcing Vegetables. The problems connected with the forcing of such vegetables as lettuce, cucumbers, tomatoes, rhubarb, and melons, in cold frames, hotbeds, and greenhouses. Lectures and exercises in the greenhouses.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 2 credits; 1 lecture; 1 laboratory period.

206. Forcing Vegetables. Continuation of course 205.

Prerequisite: Horticulture 205. Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

207. Systematic Olericulture. Description, nomenclature, and classification of vegetables. Exercises are given in displaying and judging vegetables.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 1 credit; 1 laboratory period.

209. Commercial Truck Gardening. Only the purely commercial aspects of market gardening and trucking are offered in this course. Problems of growers in the production of vegetables on an extensive scale for market and cannery will be considered. Students will be fitted by this course for extensive or intensive operations, and for managerial positions. Particular attention will be paid to modern methods of marketing vegetables; and the economics of producing vegetable crops will be treated in lectures and discussions.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

210. Commercial Truck Gardening. A continuation of course 209.

Prerequisite: Horticulture 209. Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Landscape Gardening

(For the first course in Landscape Gardening, see Pomology 101-b.)

301. Landscape Gardening. All students should be interested in everything that pertains to the decoration of the home, the improvement of school grounds, the beautifying of streets, and the establishment of recreation grounds and parks. In the course in Landscape Gardening the general principles of this are so treated as to apply to the up-building of the aesthetic in everyday life.

Required of Agricultural juniors electing Horticulture as a major; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

303. Tree Surgery. The principles of tree surgery are presented and put into execution in the laboratory. All the varying cuts, cavities, fillings, bracing, and cultivating will be worked out in a practical manner.

Elective; junior year; first semester; 1 credit; 1 laboratory period.

304. Tree Surgery. A continuation of course 303.

Elective; junior year; second semester; 1 credit; 1 laboratory period.

305. Plant Materials. To create satisfactory landscape effects, one must have a broad knowledge of the materials with which landscape architects must work. A thorough study is given to trees, both evergreen and deciduous, shrubs, vines, perennial herbaceous plants, biennials and annuals, with a view to bringing out their characteristics, such as foliage, color, form, adaptation, hardiness, and artistic effect.

Prerequisite: Horticulture 301. Elective; junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

306. Plant Materials. A continuation of course 305.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

307. Theory and Design. A study of the best works of prominent landscape architects, together with a wide range of collateral reading bearing upon the various problems. Private estates, public parks and play grounds, boulevards, and cemeteries will be

carefully studied. Reports, such as those of park boards and landscape architects, will also be studied.

Prerequisites: Horticulture 301, 305, 306. Elective; senior year; first semester; 2 credits; 2 laboratory periods.

308. Theory and Design. A continuation of course 307, in which a large portion of the time will be devoted to the preparation of planting plans. Outside time will be required for collateral reading.

Prerequisites: Horticulture 301, 305, 306, 307. Elective; senior year; second semester; 3 credits; 3 laboratory periods.

309. Field Practice. A course in practical problems brought in from the field of practice. The student is required to make the surveys, do the engineering work incidental to the solving of the problem, make general plans, planting plans, grading plans, details, and, in short, perform all the duties ordinarily met with in the landscape architect's office.

Prerequisites: Horticulture 301, 305, 306. Civil Engineering required in freshman and sophomore year. Elective; senior year; first semester; 3 credits; 3 laboratory periods.

310. Field Practice. A continuation of course 309.

Prerequisites: Horticulture 301, 305, 306, 309. Civil Engineering required in freshman and sophomore year. Elective; senior year; second semester; 3 credits; 3 laboratory periods.

311. History and Literature of Landscape Architecture. Designed to give the student a good idea of the development of the art, and to bring him into close touch with the literature, past and current, that is related to the subject.

Elective; senior year; second semester; 2 credits; 2 recitations.

313. Town Planning. This course is offered in order that the student may understand, in a general way, the underlying ideas of municipal, town, and village improvement. Literature and reports are studied, town problems discussed, and methods of procedure in town improvement worked out.

Elective; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Floriculture

Students taking their major in Floriculture are required to take Horticulture 301 and 401.

401. Floriculture. An elementary course in the cultivation of greenhouse and home plants and of the common annuals and perennials used in outdoor work. The course is designed to broaden

the views of those students who are unable to take advanced courses in Floriculture, and to make them more useful citizens.

Required of Agricultural juniors electing Horticulture as a major; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$0.50.

403. Greenhouse Construction. A course particularly adapted for students specializing in Floriculture and Truck Gardening. The problems connected with the building of greenhouses, hotbeds, and cold frames are dealt with; also the selection of materials; the various systems of heating and ventilating, and the value of the various types of buildings. Lectures and laboratory exercises in greenhouse and draughting room are conducted.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

405. Forcing Flowers. The propagation and problems of culture; such as soils, ventilation, and heat, connected with the forcing of plants used in the florist's trade.

Prerequisite: Horticulture 401. Elective; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

406. Forcing Flowers. A continuation of Horticulture 405.

Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

501. Floriculture. As related to the cultivation of the common household and dooryard flowers, instruction is given in various subjects; namely, proper soils, planting of seed, transplanting, making of cuttings, cultivation, principles of heating and ventilating, and control of insect pests and diseases. In addition, such problems as the grouping and arranging of flowers, so as to obtain the best color harmonies and most pleasing effects while growing, as well as for decoration purposes, are included. The lectures are supplemented by reference reading and laboratory periods in the greenhouse and garden.

Course in Home Economics; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

503. Landscape Gardening. The general principles of Landscape Gardening are taught, the aim being to give the student sufficient foundation to understand landscape gardening as applied to home decoration; to interest the student in the home beautiful; and the improvement of our public school grounds, and city and village streets. A study is made of photographs, and of famous landscape paintings, showing good taste and design in various

phases of Landscape Gardening. Lectures and reference readings are supplemented by field exercises.

Course in Home Economics; second semester; 2 credits; 1 recitation; 1 laboratory period.

505. Vegetable Gardening and Small Fruit Culture. Care of soil, seeding, rotation, fertilizing, and the selection of the best varieties of vegetables and small fruits for use in the home garden. Lectures, laboratory, and field exercises.

Course in Home Economics; second semester; 3 credits; 2 recitations; 1 laboratory period.

Horticultural Products

Horticultural products work consists of four courses; namely, courses 601, 602, 603, and 604, each course to be a continuation of the preceding one. These courses will include training in canning, evaporation, vinegar manufacture, Loganberry juice manufacture, and the preparation of special products, such as butter, jams, jellies, glace', Maraschino, and crushed fruits. The work which will be conducted on a factory basis, will be handled according to the available products of each season. Instruction in canning will embrace grading, blanching, exhausting, capping, sterilization (both open and in retort), the manufacture of sirups and brines, labeling and storage. Both fruits and vegetables will be handled. In evaporation, instruction will be given with prunes, peaches, apricots, apples, pears, and vegetables, both kiln and tunnel driers being used. Special emphasis will be placed on grading the products, processing, packing, and general preparation for marketing. With juices, special work will be offered with Loganberry and grape juice, unfermented cider, and vinegars. With special products, instruction will be offered in the manufacture of butter, jellies, glace', Maraschino, and crushed fruit. Junior year; 3 credits; 1 lecture; 2 laboratory periods.

601. Horticultural Products. Junior year; first semester; 3 credits; 1 lecture; 3 laboratory periods.

602. Horticultural Products. Junior year; second semester; 3 credits; 1 lecture; 3 laboratory periods.

603. Horticultural Products. Senior year; first semester; 3 credits; 1 lecture; 3 laboratory periods.

604. Horticultural Products. Senior year; second semester; 3 credits; 1 lecture; 3 laboratory periods.

Research

The department of Horticulture is unusually well equipped for offering research work. In addition to the laboratory facilities, there are the greenhouses, experimental plots, and a splendid research library, well supplied with scientific books and periodicals, all combining to give the student unsurpassed facilities.

701. Research Work for Seniors. This course is offered for those seniors who are contemplating following college, experiment station, or Government work as a life career, or for those students who desire to have some special training in research technique. Problems will be assigned to the students which will give them experience in the laboratory, greenhouse, field, and library.

Elective; senior year; first semester; 3 credits.

702. Research Work for Seniors. A continuation of course 701.

Elective; senior year; second semester; 3 credits.

703. Advanced Thesis and Research Work. A course offered only for graduate students. Such students will be allowed to select problems in pomology, vegetable gardening, landscape gardening, floriculture, plant breeding, and the like.

Elective; for graduate students only; first semester; from 10 to 20 credits.

704. Advanced Thesis and Research Work. A continuation of course 703.

Elective; for graduate students only; second semester; from 10 to 20 credits.

705. Methods of Research. This course is offered to graduate or senior students interested in research work. It will be conducted as a research round table. Special drill will be given in the making of briefs and outlines of research problems, in methods of procedure in conducting investigative work, and in the preparation of bulletins and reports. The study of research problems conducted by the department of Horticulture will be taken up, and a close study made of the research work which is presented in bulletins from other institutions.

Elective; senior or graduate students; first semester; 1 credit.

706. Methods of Research. Continuation of course 705.

Elective; senior or graduate students; second semester; 1 or 2 credits.

The work in Pomology, designated as 101-a, is given the first semester, extending only to the Christmas holidays, for which 2 credits will be allowed.

The work in Landscape Gardening, designated as 101-b, begins after the Christmas holidays, and extends to the end of the second week in March, for which 1½ credits will be allowed. Registration for this course should be arranged with the first semester registration in September.

The work in Vegetable Gardening, designated as 201, begins with the third week in March and extends to the end of the second semester, for which 1½ credits will be allowed. Registration for this course should be arranged with the second semester's registration in February.

Any student completing a single third of the course will be allowed separate credits.

ONE-YEAR VOCATIONAL COURSE IN HORTICULTURE

	Semester	
	1st	2nd
General Farm Crops II (Farm Crops B).....		3
Farm Machines and Engines (Farm Mech. A).....	3	
Business English (Eng. N).....		3
Animal Husbandry (A. H. F).....		2
Practical Farm Drainage (Soils C).....		2
Farm Management (Farm Mgt. A).....	2	
Farm Soils (Soils A).....	3	
Breeding, Feeding, and Mgt. Dairy Cattle (D. H. J).....	3	
Gymnasium (Phys. Ed. 11, 12).....	½	½
Drill (Military A, B).....	1	1
Orchard Management I, II (Hort A, B).....	8	9
	<hr/> 20½	<hr/> 20½

A. Home Orchard and Garden. This course is provided for Vocational students in General Agriculture. It will deal primarily with the horticultural work of the home, the establishment and maintenance of the home orchard and home vegetable garden. It will also deal with some of the problems of beautifying of grounds.

Vocational course; second semester; 2 credits; 1 lecture; 1 laboratory period.

B. Productive Orchardring. This course is offered only for Vocational students majoring in Horticulture and takes the place in the schedule of Horticulture A, the Home Orchard and Garden. This is a lecture course, dealing with some of the main problems of orchard maintenance, such as pruning, spraying, harvesting, and packing of fruits, the building of storage houses, etc.

Vocational course; second semester; 3 credits; 1 lecture; 2 laboratory periods.

C. Orchard Management I. This is strictly a laboratory and field course dealing with the various phases of orcharding, such as harvesting, grading, and packing of fruits, spraying and pruning, and similar problems.

Vocational course; first semester; 8 credits; 3 full afternoons a week.

D. Orchard Management II. A continuation of Horticulture C. This course will deal with setting, staking, pruning, spraying, budding, grafting, and similar orchard problems.

Vocational course; second semester; 9 credits; 3 afternoons a week.

POULTRY HUSBANDRY

JAMES DRYDEN, Professor
CHARLES STOCKTON BREWSTER, Instructor

In recognition of the importance of the poultry industry, and to meet the demands of students who aim to give special attention to this industry after leaving college, the department of Poultry Husbandry was established. Poultry keeping is a part of every well-regulated system of diversified farming, and at the same time offers opportunity for profit-making as a special business under special conditions. The two poultry plants at the College offer opportunities for study of the practical as well as the theoretical side of the poultry industry.

Equipment. The equipment of this department consists of a number of poultry houses of different types; about 1,000 fowls of several breeds and varieties; twenty incubators of several different makes; brooders of different types; hatching, brooding, and colony coops; bone and clover cutters; fattening batteries; trap-nests; and various other appliances necessary for practical poultry keeping. A recent valuable addition is forty standard exhibition coops mounted on movable tables. These are used in judging poultry from the utility standpoint. There are also sets of charts, lantern slides, motion pictures and photographs, illustrating breeds of fowls, poultry farms, and houses.

COURSE IN POULTRY HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Poultry Husbandry (P. H. 1, 2).....	4	4
Embryology and Histology (Zool. 104, 105).....	3	3
Anatomy of the Fowl (Vet. Med. 12).....	2	
Poultry Diseases (Vet. Med. 12).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Ins. 1, 2).....	1	1
Approved Electives	3	6
	17	17

	Semester	
	1st	2nd
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Poultry Husbandry (P. H. 3, 4).....	5	5
Genetics (Zool. 120).....	3	
Farm Management (Agron. 505).....		3
Approved Electives	6	4
	<hr/> 16	<hr/> 16

The following courses are offered:

1. Poultry Husbandry. Includes a study of breeds of domestic poultry, their history and classification; principles and methods of breeding for different purposes, emphasizing the laying and market qualities of the breeds; principles and methods of poultry-house construction. Laboratory work consists of practise in judging from fancy and utility standpoints; planning, estimating, and building poultry houses and appliances. Current poultry literature dealing with these subjects will be considered.

Required of all juniors in Poultry Husbandry; junior year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

2. Poultry Husbandry. A continuation of course 1. Includes a study of the principles and practises involved in natural and artificial incubation and brooding; study of the egg and its development. Experimental work dealing with incubation problems will be carefully studied. Laboratory work consists of a detailed study of different makes of incubators and brooders and actual practise in running incubators and brooders. An opportunity will be given wherever possible for the student to work out some definite problem.

Prerequisite: Poultry Husbandry 1. Required of all juniors in Poultry Husbandry; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00.

3. Advanced Poultry Husbandry. A continuation of Poultry Husbandry 2. Includes a study of feeds suitable for poultry; the principles and practices of feeding for egg production and fattening; feeding young and growing chicks; feeding appliances. Laboratory work in feeding fowls for egg production and fattening under practical or experimental conditions; planning the work, and

compiling and writing up the data; the compounding of rations; study of feeds. Current poultry literature and experimental work on feeding will be studied.

Prerequisites: Poultry Husbandry 1, 2. Required of all seniors in Poultry Husbandry; senior year; first semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00.

4. Advanced Poultry Husbandry. A continuation of Poultry Husbandry 3. Includes a study of the general care and management of poultry and its products; marketing eggs and poultry; methods of grading, packing, shipping, and storing eggs and poultry. Study of farm records. As a final problem each student will work out complete plans for the layout and management of a commercial poultry enterprise. Laboratory work will consist in killing, picking, packing, and grading poultry and judging, grading, testing, and packing eggs.

Prerequisites: Poultry Husbandry 1, 2, 3. Required of all seniors in Poultry Husbandry; senior year; second semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00.

Note. Each student specializing in Poultry Husbandry will be required to plan and conduct some original investigational work and prepare a thesis covering it.

6. Practical Poultry Keeping. A course arranged to meet the demands of students who desire a knowledge of practical poultry keeping as it applies to general farm conditions, but who do not wish to specialize in the work. Includes a brief study of breeds and types of poultry; selection and breeding of farm poultry; poultry-house construction and equipment; hatching and rearing; feeds and feeding; marketing and management.

Required of sophomores in Agriculture; second semester; 2 credits; 2 lectures or recitations; 1 laboratory period. Fee \$1.00. Text: Lippincott, Poultry Production.

8. Poultry Breeding. Includes a study of the origin and history of the breeds and varieties of poultry; the principles of breeding as they apply to poultry with special reference to the inheritance of egg production; systems and methods of breeding as they affect production. Laboratory work will consist in judging fowls for egg production and utility qualities; practise in selecting and culling fowls.

Elective; first semester; 2 credits; 1 lecture or recitation; 1 laboratory period.

9. Marketing Poultry Products. This course is given primarily for students in Home Economics but is open to others who have had satisfactory preparation for the work. Includes a study of types of market poultry and eggs; improving the quality of poultry products by feeding, etc.; principles involved in buying poultry and eggs; a study of the changes that take place in poultry and eggs while being held; the use of, and comparative value of, different grades of eggs; methods of preserving eggs. Laboratory work will consist of judging, candling, grading, and packing eggs; judging dressed poultry; drawing, trussing, deboning, carving; comparative study of different grades of poultry flesh and eggs.

Elective; junior and senior years in Home Economics; first semester; 1 credit; 1 lecture; 1 laboratory period. Fee \$1.00.

*** Poultry Diseases.** (Vet. Med. 12) Elective; required of all seniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 2 laboratory periods; second semester.

***Anatomy of the Fowl.** (Vet. Med. 11.) Elective; required of all juniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 1 laboratory period; first semester.

A. Farm Poultry. Arranged to meet demands of students unable to take the degree course. Students will be given practice in judging poultry, feeding laying and fattening birds, caponizing, operating incubators, feeding and rearing chicks, etc., as well as assisting in general work about the department. Practical work supplemented with lectures and recitations in class room.

Vocational course in Agriculture; second semester; 2 credits. Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

B. A continuation of course A, but may be taken separately.

Second semester; 3 credits Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

* These two courses are given as Vet. Med. 11 and 12.

SOILS

WILBUR LOUIS POWERS, Professor
CHARLES VLADIS RUZEK, Associate Professor
_____, Assistant Professor (Ext.)
_____, Instructor
JOHN ELIJAH PITMAN, Fellow

The soil is the foundation of all agriculture and no student in agriculture is well prepared for his work who is not fully versed in his knowledge of it. The work in soils includes a thorough treatment of the pure and applied branches of the subject, including two main groups of subjects; namely, (a) the soil moisture group and (b) soil fertility group. Soil physics, soil drainage, irrigation farming, and dry farming operations are primarily related to the former group, while soil fertility, the effect of crop rotations, and soil management ultimately deal more with the second group. Soil surveying contemplates both groups of subjects, all of which have their inter-relations.

Degree courses extending over four years are offered in (a) Soils and (b) Drainage and Irrigation.

The purpose of the courses in Soils is to give the student a thorough training in this important phase of agriculture, making him competent for his work on the farm or preparing him for positions in state or federal service.

Courses in Drainage and Irrigation hitherto have dealt with these subjects largely from the engineer's standpoint; and the disposal of water from soil or distribution of water within the farm unit has been considered of such small concern as to require nothing but a brief and more or less superficial treatment. Reclamation development has progressed so far, however, that haphazard and loose practices are no longer considered profitable. If the reclamation projects are to pay for costly development, great care must be given to the location of tile or the distribution of water on the farm. The adoption of scientific methods of handling soils and crops under irrigation and drainage projects, is coming to be regarded as of paramount importance. With the further extension of state and federal aid to reclamation, there will be a greater demand for men who have a knowledge of how most successfully and economically to use water which the engineer's canals and reservoirs provide. These men must know the best time, amount, and method of irrigation, and the effects of irrigation upon soils and crops. They should also know the relations between

soils, soil waters, and drainage, and understand how to locate and construct drains and treat the soil so as to secure the highest possible efficiency for each unit of tile employed.

In this course students combine practical and theoretical training received through lectures, laboratory exercises, and field experiments. The course offers opportunity for electing courses in general agriculture, economics, and other electives to give the student a broad training for modern dry farming, irrigation farming, irrigation investigations, or the work of a drainage contractor or drainage specialist.

Equipment. A large soil laboratory is equipped with the necessary apparatus for the complete study of the physical properties of soil and problems of soil management. Ample desk room, supplied with running water, gas, compressed air, and electricity, is available. Electric centrifuges and shakers, electric bridge for alkali testing, electric air baths, analytic and torsion balances, microscopes, blast lamps, aspirators, percolators, capillary tubes, mulch cylinders, soil sieves, scales, solution balance, compression filters, soil-sampling tubes, etc., form part of the equipment for the work in Soils. Soil surveying and mapping outfits, soil survey charts of the United States, and a collection of samples of the chief soil types of Oregon and the United States, are available.

A Soil Preparation room equipped with benches, soil-grinding and sifting machinery, and ample space for the drying, preparation, and storage of large quantities of the different soil types used in the laboratories, is available.

For the class of field work in Drainage and Irrigation, surveying instruments, tile, and ditching tools, weirs, flumes, hook gauges, water-stage register, electric pumping plant, etc., are available. Weather-recording instruments of different kinds supply equipment for the course in Climatology. Laboratories fitted with desks, ovens, etc., afford opportunity for studies of the movement and retention of irrigation water in soil, the effects of irrigation upon soils and crops, the effect of the tile drainage upon soils of different types, their rate of drainage, etc. The experimental plots and field work in this course offer exceptional opportunity to study drainage and irrigation under practical field conditions. On the College farm the students build weirs, measure water, lay out distribution systems, make cement pipe for laterals, and test pumping machinery. On the drainage plots, the rate of discharge is measured and the effect of drains and soil conditions on water

table is studied. Students are required to lay out, level, set grade stakes, and lay tile in some part of a drainage system on the College land.

An Exhibit Room has been provided and equipped with exhibit cases and racks for displays of the soil sample collections, sub-soils, hardpans, soil analyses, soil colors, soil drainage and irrigation exhibits, etc.

A well-stocked reference library is available. The Experiment Station farms at Corvallis and in other parts of the State, together with the cooperative trials in different counties, offer opportunity for field study of soil problems.

COURSES IN SOILS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

(a) General Soils

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Forage Crops (Farm Crops 9).....	2	
Cereal Crop Lectures (Farm Crops 7).....	2	
Agricultural Bacteriology (Bact. 501, 502).....	3	3
Land Drainage (Soils 103).....		3
Soil Chemistry (Chem. 503).....	3	
Soil Physics (Soils 3).....		4
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	2	5
	<hr/> 17	<hr/> 17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Agricultural Geology (Min. 171).....	3	
Soil Fertility (Soils 7).....	4	
Crop Improvement (Farm Crops 15).....		3
Farm Management (Farm Mgt. 1).....		3
Soil Surveying (Soils 13).....		2
Approved Electives	6	5
	<hr/> 16	<hr/> 16

(b) Drainage and Irrigation

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Irrigation Farming (Soils 105).....	3	
Climatology (Soils 107).....		2
Topographical Surveying (C. E. 243).....	2	
Agricultural Bacteriology (Bact. 501).....	3	
Principles of Plant Pathology (Bot. 101).....	2	
Introduct. Entomology (Ento. 301).....	2	
Land Drainage (Soils 103).....		3
Elements of Dairying (D. H. 1).....		3
Crop Improvement (Farm Crops 15).....		3
Farm Power Machinery (Farm Mech. 3).....		3
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
Approved Elective		1
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Hydraulics (I. E. 101).....	2	
Hydraulic Lab. (Exp. E. 265).....	1	
Irrigation Institutions (Soils 111).....	2	
Soil Fertility (Soils 7).....	4	
Advanced Irrigation (Soils 117).....	2	
Farm Management (Farm Mgt. 1).....		3
Irrigation Management (Soils 119).....		1
Feeds and Feeding (A. H. 23).....		3
Dairy Herd Management (D. H. 40).....		3
Extempore Speaking (Eng. 104).....		2
Approved Electives	2	
	—	—
	16	15

The following courses are offered:

1. **Soils.** The origin, formation, and classification of soils; a study of the physical properties of soil moisture, heat, and air; the effects of tillage, drainage, and irrigation. The plant foods and soil fertility, fertilizers, crop rotations, and manures. Acid and alkali soils.

Prerequisites: Chemistry 100 and 101. Course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Lyon, Flippin and Buckman, Soils.

2. Soils. Continuation of the course outlined under "Soils 1."

Course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Lyon, Flippin and Buckman, Soils.

3. Soil Physics. Advanced study of the geology of soils, with their origin, formation, physical composition, and classification. Soil moisture and moisture movements and conservation. The various physical processes of the soil — surface, tension, osmosis, capillarity, diffusion, etc. The effects of the various crops and the different methods of culture upon the texture, aeration, temperature, and moisture of the soil, and the resulting alteration in crop-producing power. The influence of washing, drainage, and irrigation upon soils. Work in the laboratory will consist of the determination and comparison of such physical properties in the various soil types as, specific gravity, water retention, capillarity, organic content, etc.; the physical effect of mulches, rotations, and cropping; soil sampling and judging; the mechanical analysis of soils.

Elective; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Mosier and Gustafson, Laboratory Manual.

5. Soil Physics, Elective. Similar to course No. 3, but shorter, dealing with the more important phases of the subject. Designed as an elective for agricultural students unable to take the regular course in Soil Physics, and for students in Irrigation Engineering.

Elective; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Mosier and Gustafson, Laboratory Manual.

7. Soil Fertility. Advanced work in the composition and values of fertilizers and barnyard and green manures, and the maintenance and improvement of fertility by the use of the same. The effect of the various crops and different systems of farming upon the fertility of the soil. Crop rotations and fertility in different sections of the State and the United States. The productivity and best use of the different types of Oregon soils, their

plant food requirements and comparative values, and methods of improvement of each. Field plot and pot culture investigations. Where necessary, the laboratory work may be omitted and the lecture work only taken (see Soils 9).

Elective; senior year; first semester; 4 credits; 3 recitations; 1 laboratory period. Fee \$1.00. Deposit \$2.00.

9. Soil Fertility Lectures. Same as Soils 7 except no laboratory work.

Elective; senior year; first semester; 3 credits; 3 recitations. Fee \$0.50.

11. Dry Farming. One of the special courses given in Dry Farming, another of which is described under Farm Management as Semi-Arid Farm Management. This course takes up the advanced study of the subject of moisture conservation, special tillage methods and machinery, soil and climatic conditions, etc., in dry-farming regions, with particular reference to Oregon and the Northwestern states. Given 1920 and alternate years thereafter.

Prerequisite: Soils 3 or 5. Elective; junior or senior year; second semester; 1 credit; 1 recitation.

13. Soil Surveying. For the advanced student who wishes to specialize in Soils for service in the state experiment stations or the Government Bureau of Soils. The course includes some advanced study of the classification of soils and soil areas of the United States, of Oregon, and of the Northwest, but most of the time is devoted to work in the field, making regular and completed soil surveys of assigned areas, with a report thereon.

Prerequisite: Soils 3 or 5. Elective; senior year; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

15. Advanced Soil Work. The advanced student specializing in Soils may study the various soil types of Oregon through mechanical analysis, and other physical tests; may undertake field work in soil surveying and mapping; or, through wire-basket, pot-culture, and field-plot tests, may determine the effects of various systems of cropping, or fertilizing, or of soil bacteria, upon soil fertility.

Prerequisites: Soils 3 and 7. Elective; senior or graduate year; either semester; 2 to 5 credits. Fee \$1.00. Deposit \$2.00.

16. Advanced Soil Work. Continuation of course 15.

Elective; senior or graduate year; either semester; 2 to 5 credits. Fee \$1.00. Deposit \$2.00.

101. Drainage and Irrigation. Principles of drainage and of irrigation; use of chain and level as applied to location and installation of tile drains or irrigation laterals. Design of tile systems; their effects upon soils and crops; costs and benefits.

Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50. Deposit \$1.00.

103. Land Drainage. The history of drainage; road, field, and sanitary drainage on the farm; the different systems of drainage; methods of locating, installing, operating, and maintaining drainage conduits, cost, efficiency, and profits; drainage districts, their organization; laws governing. Lectures, notes, readings, and field work.

Elective; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00.

105. Irrigation Farming. Methods of obtaining, distributing, and conserving irrigation waters. Handling of different crops under irrigation. Cost and profits thereof, and duty of water in various districts of Oregon. Water rights and irrigation codes. Field and laboratory studies of irrigable qualities of different soils, laying out of irrigation systems.

Elective; junior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Widtsoe.

107. Climatology. Practical meteorology; observing and recording local weather and forecasting; a study of the climate of Oregon and the effect of climate upon agriculture. Class room and laboratory work. Given alternate years.

Elective; junior or senior year; second semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$0.50. Deposit \$1.00.

109. Advanced Land Drainage. A study of drainage problems and conditions in the field. The actual surveying, laying out, draughting of plans, estimation of cost, and installation of drainage systems at different points in the State, is required of students taking this course. A complete report of the organization of a drainage district is prepared by each class.

Prerequisite: Drainage and Irrigation 1. Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods (week end). Fee \$0.50. Deposit \$1.00.

111. Irrigation Institutions. A brief history of the development of water laws. Water rights and irrigation codes in the different states, particularly in the Northwest and Oregon. Appro-

priation, adjudication, and administration of water. Reclamation and other government and state land acts affecting irrigation development. Organization and administration of irrigation districts and projects, water users' associations, etc. Discussion of public questions relating to irrigation.

Elective; senior year; first semester; 2 credits; 2 recitations. Text: Chandler.

113. Irrigation Farming Elective. Special course for Irrigation Engineering students or other students who cannot take the regular course in Irrigation Farming the first semester. This course deals with the handling of irrigation water after it reaches the farm, and of the different crops under irrigation. The irrigable quality of different soils, the duty of water in various districts of Oregon, and water rights and irrigation codes from the standpoint of the farmer, are important features of the course.

Elective; junior or senior year; second semester; 2 credits; 2 recitations.

115. Irrigation Field Practice. This course is planned to add interest to irrigation farming and develop a practical knowledge of irrigation farming conditions. Careful records are to be kept of water used on different soils and crops and of the field obtained from definite areas. This work may be done during the summer months in connection with duties as ditch rider or other field agent. A report is required and work is to be outlined with the instructor in advance.

Prerequisite: Drainage and Irrigation 3. Following second or third college year's work; 1 to 3 credits.

117. Advanced Irrigation. Irrigation literature and methods of irrigation investigation. Field and laboratory studies of irrigation experiments and calculation of depth of water applied and of the most economical production thereby secured. Costs and profits connected with irrigation are determined. Analysis of data and preparation of a report is required in this course. Field examinations will be made, where possible, of some of the largest projects in the State.

Senior year; first semester; 3 credits. Fee \$0.50. Deposit \$1.00.

119. Irrigation Management. A study of the operation and maintenance of irrigation systems. Methods and records for water masters. Control of agencies destructive to ditches. Cost and dura-

bility of materials used in distribution of water on the farm. Water rotations for different types of farming.

Required of seniors and advanced students specializing in Drainage and Irrigation. Senior or graduate year; second semester; 1 credit. Given in 1919 and alternate years.

121. Advanced Drainage or Irrigation Work. Under this head the student who has completed the courses offered may take up further study of special problems in either subject, such as the drainage of alkali lands, drainage against seepage, study of water-table fluctuations, runoff, etc.; or field studies of the duty of water for a certain district, conservation of irrigation waters, effect of irrigation on soil moisture conditions, etc.

Elective; senior year; either semester; 2 to 5 credits. Fee \$0.50. Deposit \$1.00.

123. Advanced Drainage or Irrigation Work. Continuation of course 19 for students who wish to elect two semesters of the advanced work.

Elective; senior year; either semester; 2 to 5 credits. Fee \$0.50. Deposit \$1.00.

RESEARCH

The department of Soils is well equipped for offering research work, the experiment fields, soil tanks, laboratories and library, and plans and methods used in soil, irrigation, and drainage investigations are accessible to the graduate students.

501. Advanced Thesis and Research Work. A course for graduate students either as a major or minor. Students will be allowed to select problems in soil physics, analysis, surveying, fertility, irrigation, drainage, soil management, dry farming, or related subjects.

Elective; graduate students; first semester; 5 to 20 credits.

502. Advanced Thesis and Research Work. A continuation of course 501.

Elective; graduate students; second semester; from 5 to 20 credits.

A. Farm Soils. A brief history of the origin of soils; the fertility of soils; the most valuable chemical constituents; their exhaustion and replenishment; the most important physical factors; their deterioration or improvement. The physical components; their relative value and amounts in soil mixtures. Practice in

judging the chief soil types of Oregon. The effects upon soils of tillage, manuring, crop rotation, drainage, and irrigation.

Vocational course; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Whitson and Walster, *The Soil*.

C. Practical Farm Drainage. The value of drainage, and the methods and cost of installing drainage systems under different soil and land conditions, district drainage, etc.

Vocational course; second semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.00.

E. Irrigation Farming Practices. The most effective methods of handling irrigation waters, the different crops under irrigation, and the cost and profits thereof. Organization as affecting water use and control in irrigated districts.

Elective; Vocational course; first semester; 2 credits; 2 recitations. Fee \$0.50. Text: Fortier, *Use of Water in Irrigation*.

G. Dry Farming Practices. Methods of handling soils under dry farming conditions, tillage, seeding, moisture control, usable water capacity of dry farming soils; root systems of dry-land plants, etc.

Elective Vocational course; second semester; 2 credits; 2 recitations. Fee \$0.50.

VETERINARY MEDICINE

BENNETT THOMAS SIMMS, Professor
Instructor

The object of the courses in veterinary medicine is to help fit the students for the successful handling of live stock. Comparative anatomy and comparative physiology familiarize the student with the normal structures and functions of the animal body, thus laying a foundation for courses in judging, breeding, feeds and feeding, nutrition, and diseases of animals.

The work with diseases is taken up from the standpoint of the live-stock owner. The students learn to recognize diseases, to care for sick animals and to prevent disease through proper methods of sanitation and management. The importance of quarantine, the different methods of control and eradication of disease, and the role of the stock owners in maintaining this work are considered.

Equipment. This department has its office, physiological laboratory, and lecture room on the second floor of the Dairy Building. Dissections, autopsies, and clinics are conducted in the Veterinary Clinic Building. This building has an amphitheater for clinics, dissecting room, drug and instrument room, dressing room with hot and cold water and shower bath, sufficient stable room for stabling animals used for clinical and experimental purposes, and sufficient storage room for keeping feed for the stock. Laboratory equipment includes mounted skeletons of the horse and cow, complete sets of loose bones, dissected specimens preserved in museum jars, rotary microtome with accessories, microscope, electric oven, electric thermostat, steam and hot air sterilizers, the necessary glassware for physiological laboratory work, and the necessary instruments and drugs for clinical work.

The following courses are offered:

1. **Comparative Anatomy.** Anatomy is taught in the most practical manner possible. Special attention is paid to the digestive systems of the horse and cow; to the foot, the muscles of locomotion, and the teeth of the horse. The laboratory work includes complete dissection of the digestive, urinary, genital, and respiratory systems, and partial dissection of the circulatory, muscular, and nervous systems.

Prerequisites: Zoology 108, 109. Chemistry 500, 501. Junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$2.00.

2. Comparative Physiology. The study of the functions of the body. Special attention is paid to the digestive system. The physiological processes of all the domestic animals are studied, with special emphasis on the horse and cow. The laboratory work consists of practical experiments which are correlated with the lectures.

Prerequisite: Veterinary Medicine 1. Junior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$1.00.

3. Diseases of Live Stock. The parasitic, infectious, and non-infectious diseases of domestic animals are considered in this course. Special attention is given to the prevention and control of parasitic and infectious diseases. The laboratory work consists of a free clinic, which provides an abundance of both medical and surgical work. The students assist in handling and diagnosing the medical cases, and in operating on the surgical cases. They also observe the results of treatment of all animals in the hospital.

Prerequisites: Veterinary Medicine 1 and 2. Senior year; first semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

4. Diseases of Live Stock. A continuation of course 3.

Senior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

5. Veterinary Histology. The histology of the domestic animals.

Elective; junior or senior year; first semester; credits to be arranged. Fee \$1.00.

6. Veterinary Histology. A continuation of course 5.

Elective; junior or senior year; second semester; credits to be arranged. Fee \$1.00.

11. Anatomy of the Fowl. A study of the structure of the body of the fowl. The laboratory work consists principally of dissection.

Fee \$0.50.

12. Poultry Diseases. The parasitic, infectious, and non-infectious diseases are considered. Special emphasis is placed upon methods of prevention and control of parasitic and infectious diseases. Students observe autopsies, methods of diagnosis, and treatment of fowls.

Junior or senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

14. Diseases of Live Stock. A one-semester course for Agronomy students. The more common diseases, with the methods of

prevention and control, are considered. The laboratory work consists of a free clinic, which provides an abundance of animals for both surgical and medical treatment.

Prerequisites Zoology 108, 109. Chemistry 500, 501. Junior or senior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

A. Diseases of Dairy Cattle. A practical course given to the Dairy Husbandry students who are taking the vocational course. Vocational students; first semester; 2 credits; 2 recitations.

B. Diseases of Dairy Cattle. A continuation of course A. The laboratory work consists of a free clinic. The students observe methods of diagnosis and treatment of both medical and surgical cases.

Vocational students; second semester; 2 credits; 1 lecture; 1 laboratory period. Fee \$0.50.

C. Diseases of Domestic Animals. A practical course given to Animal Husbandry students who are taking the vocational course. The laboratory work consists of a free clinic, which provides an abundance of animals for treatment.

Vocational students; first semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50. Text: P. B. Hadley, *The Horse in Health and Disease*.

ZOOLOGY AND PHYSIOLOGY

GEORGE FRANCIS SYKES, Professor
ASA CHANDLER, Instructor
CHARLOTTE NEVIL HURD, Instructor
* HOWARD MARSHALL WIGHT, Instructor

The interests of human life are so intimately bound up in the facts of animal life that today, at least, a general knowledge of the science of Zoology is considered a personal asset few students can afford to omit from their college course. The instruction in this department, therefore, is designed not only to awaken interest in the study of native birds, insects, and other animals in order to afford a basic knowledge of the structure and functions of the animal body, but particularly to develop the faculty for determining the dynamic value of an animal, or a group of animals, in the solution of the problems of everyday life.

By means of lectures, laboratory work, and field observations, the student becomes familiar with the form and habits of various representatives of the animal kingdom, learning something of the mechanism of living things, of their importance as active forces in nature, and of the biological laws according to which their development is regulated. The work is adapted, so far as possible, to the particular needs of students in Agriculture, Forestry, Pharmacy, and Home Economics.

Opportunity is offered, moreover, to those who desire it, to receive training for teaching zoology, physiology, or nature study in the public schools; for development of the game and food resources of the State; or for the pursuance of studies in the field of research. In connection with the course in Pharmacy, the required work forms a valuable pre-medical course.

Equipment. The laboratories of the department occupy the following rooms on the third floor of Agricultural Hall; offices, physiological laboratory, laboratory for embryology and histology, general laboratory for zoology, lecture room, vault, and photographic dark room. The general laboratory is equipped with desks with individual drawers to accommodate 280 students; each desk is provided with compound microscopes, dissecting microscopes, and various minor pieces of apparatus. The physiological laboratory is similarly equipped for 225 students and in addition is provided with an articulated skeleton, a dissectible human skull, a

* On leave of absence.

complete Azoux model of the human body, greatly enlarged Azoux models of the brain, eye, ear, and other organs, a set of the celebrated Leuckart zoological charts, and a good supply of specimens and dissections for illustrating the work in physiology. The laboratories are provided with high-grade compound and dissecting microscopes, a Minot rotating microtome, paraffin bath, eye piece and stage micrometers, and an abundant supply of minor instruments.

As an adjunct to the laboratory facilities a set of nursery troughs for fish cultural purposes has been erected on the campus adjacent to the zoological laboratory.

The museum contains, in addition to a beautiful collection of native birds, a small collection of mounted mammals, the Ladd collection of bird skins, a large collection of eggs of native birds, a small collection of fishes and reptiles, a considerable number of marine invertebrates, including a small but beautiful collection of Philippine shells, and numerous specimens of a miscellaneous nature.

COURSE IN ZOOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
* Electives	13	13
	—	—
	16	16

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

The following courses are offered:

101. **General Zoology.** A general introduction to advanced courses in the department; designed also for students who, without

intending to pursue the subject further, desire a general view of zoological work and its problems; lectures and laboratory work supplemented by collateral reading and field investigation, gives general knowledge of different animal forms; distribution; habits; mechanism and functions of body; introduction to laboratory methods of dissection and experiment; outline of biological theories of selection, adaptation, and evolution. Runs throughout the year.

The courses in Pharmacy, Physical Education, and for Pre-medical students; freshman year; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

102. General Zoology. A continuation of 101.

Prerequisite: Zoology 101. The courses in Pharmacy and Physical Education; freshman year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

103. Functional Zoology. A brief course designed to give students in Home Economics some conception of the structure and physiological activities of animals, as a basis for the work in Physiology. The work consists of a general survey of the forms and activities of living organisms, with general reference to the human organism.

The course in Home Economics; freshman year; first or second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

104. Embryology and Histology. The origin and development of the animal body; the elementary structure of the adult organs and tissues; a study of the chick and pig with reference to other animals and man; practice in micro-technique, killing, fixing, imbedding, sectioning; adapted to the requirements of the general student as well as to those intending to study Veterinary medicine.

Prerequisites: Zoology 101, 102; or 108, 109; or the equivalent. For students in Agriculture, Pharmacy, Physical Education, and other courses; junior or senior year; first semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each. Fee \$2.00. Deposit \$3.00.

105. Embryology and Histology. A continuation of course 104.

Prerequisite: 104. For students in Agriculture, Pharmacy, Physical Education, and other courses; junior or senior year; second semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each. Fee \$2.00. Deposit \$3.00.

106. Game Propagation. A laboratory and reading course, supplemented by field work in the propagation of food animals of the field and forest; the breeding and protection of game birds and mammals; methods of conducting game reservations; and a comparative study of game laws.

Elective for students in Agriculture and Forestry; first semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged. Fee \$0.25.

107. Ornithology. A lecture course and field study of the common birds of Oregon; the course aims to develop an interest in the native birds, their habits, and haunts, with particular reference to their usefulness.

Elective; second semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged. Fee \$0.25.

108. Principles of Economic Zoology. Designed for both students in Agriculture and in Forestry; the facts and conditions that render animal life an important factor in the economic problems of life; prefaced by a study of animal forms, distribution, and habits. The physiological functions of the body. Lectures, laboratory work, and collateral reading.

Required of Agricultural and Forestry sophomores; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

109. Principles of Economic Zoology. Continuation of course 108. A dynamic interpretation of life; contact in the field with vital economic problems, agricultural or sylvan. An outline of the different biological theories, natural-selection, adaptation, evolution; acquaintance with their fundamental principles leading to an insight into the more far-reaching significance of every-day problems.

Prerequisite: 108. Required of Agricultural and Forestry sophomores; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

110. Animal Parasites. An advanced course for the study of such parasitic forms as flukes, tapeworms, nematodes, fish "lice," cattle ticks, etc., that affect the health of man, and of domestic and food animals; the study will be primarily ecological, the object being to obtain a more exact knowledge of the conditions which produce parasitism, to the end that by intelligent control,

diseases and economic losses may be rendered less liable, and preventive measures made productive of more permanent results.

Prerequisites: Zoology 101, 108, or the equivalent.

Elective to students in Agriculture, Forestry and Pharmacy, Veterinary Bacteriology; junior or senior year; first semester; 2 credits; hours to be arranged. Fee \$1.00. Deposit \$1.00.

111. Protozoology. An advanced course for the study of microscopic animals with a view to their relation, beneficially or injuriously, to man, particular attention being paid to such pathogenic forms as blood spores and enteric parasites, with some reference to soil protozoans and water animalcules.

Prerequisites: Zoology 101; or 108, or the equivalent. Elective for students in Agriculture, Pharmacy, Aquiculture, and Bacteriology; second semester; 2 credits; hours to be arranged. Fee \$1.00. Deposit \$1.00.

112. Research and Thesis. Opportunity will be given students who desire to specialize in Zoology and Physiology to take up work not given in the regular courses, or to undertake the investigation of special problems. Work for the master's degree, either as a major or as a minor in this department, may be selected. It is the policy of the department to allow the student to develop his own initiative in the selection of a problem, and in outlining and conducting his investigations, but with the cooperation of the head or other member, of the department.

Elective for seniors and graduates; first semester; credits to be arranged.

113. Research and Thesis. A continuation of course 112.

Elective for seniors and graduates; credits to be arranged. Deposit \$3.00.

114. Aquiculture. Lecture, laboratory, and field course dealing with the problems and methods of sea-farming and fish culture; the hatching and rearing of fish and other aquatic food animals, the planting and care of oyster and clam beds, and a study of the various methods of production and preparation for market.

Prerequisite: Zoology 108, or the equivalent. Elective for Agriculture and Forestry students; first semester; 3 credits; hours to be arranged. Fee \$1.50. Deposit \$1.00.

115. Aquiculture. A continuation of 114, dealing primarily with fresh water problems.

Elective for Agriculture and Forestry students; second semester; 3 credits; hours to be arranged. Fee \$1.50. Deposit \$1.00.

116. Taxidermy and Zoological Collecting. Lecture, laboratory, and field course in the methods involved in the preparation of skins, the preservation of museum specimens, and a study and practice of the methods involved in field survey work.

Prerequisite: Zool. 108, or the equivalent. Elective for Agriculture and Forestry students; second semester; credits to be determined; hours to be arranged. Fee \$1.50. Deposit \$1.00.

120. Genetics. A lecture course dealing with the general principles of heredity, and the factors involved in variation and inheritance; the fundamental principles of breeding. The course will be prefaced by lectures on the phenomena of reproduction; and will be followed by an explanation of the mechanism of heredity, involving a discussion of problems of inheritance of acquired characters, segregation, dominance, and sex determination, with respect to their application both to the human and to the domestic forms. Experimental problems may be outlined for practical investigation for those who may desire to carry on such work.

Elective for juniors in Agriculture and others; first semester; 3 credits; 3 lectures; 1 laboratory period of 1 hour. Fee \$0.25.

122. Racial Biology. Designed not only for the general student but also for students particularly interested in the modern biological background of sociological, psychological, and ethical theory; a study of the biological organization of the human species; our anatomical heritage; evolution and man; heredity in relation to eugenics; dynamic factors and the biological progress of the human race in war and peace; the physiological basis of human behavior; present tendencies in the human species.

Elective for students in Sociology, Education, and others; second semester; 2 credits; 2 lectures. Fee \$0.25.

201. Physiology and Anatomy. Intended not only for the general student, but also for students particularly interested in this branch of Zoology, and for those who expect to study medicine; a study of the structure, significance, and function of the human body, with reference to the animal body in general; the laboratory course includes some work upon the gross anatomy and the histology of the various tissues and organs of a typical mammal; also includes experiments and demonstrations with foods, the study of blood, nerve, muscle, reactions, etc.

Prerequisites: Zoology, 101, 102, or the equivalent. Physical Education freshman, Pharmacy sophomores; elective for other students; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

202. Physiology and Anatomy. A continuation of course 201.

Prerequisites: Zoology 101, 102, 201. Pharmacy sophomores; elective for other students; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

205. Nutritional Physiology. An advanced course dealing particularly with the process of digestion, absorption, nutrition, secretion and excretion.

Prerequisite: 207, or the equivalent. Elective for students in Home Economics and others; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Deposit \$3.00.

207. General Physiology. The object of this course is to give to the Home Economics student the knowledge of life processes and anatomical relationships which will be most useful in maintaining the highest efficiency of the human mechanism; the chief functions of the human body and the laws of health falling naturally within the province of the physiologist, including such experimental, histological, and anatomical work as will best serve the object of the course.

Home Economics; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

208. General Physiology. A continuation of 207.

Home Economics; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

209. Neuro-Physiology. An advanced course dealing with the special processes and anatomical relationships of the nervous system; an examination of the physiological bases of mental states; experimentation in neuro-muscular reactions; studies in animal behavior. **Prerequisites:** 101, 102, 201, 202, or the equivalent. Elective; Pharmacy and other students; first semester; 2 credits; 1 lecture; 1 laboratory period of three hours. Deposit \$3.00.

A. Elementary Physiology. For the women of the Home-makers' course; an elementary study of the process and organs of digestion, circulation, excretion, reproduction, etc. The physiological basis of the laws of hygiene.

Required of women in the Home-makers' course; first semester; 2 credits; 2 lectures; 1 laboratory period of two hours. Fee \$1.50. Deposit \$1.00.

SCHOOL OF COMMERCE

JOHN ANDREW BEXELL, Dean

The School of Commerce offers two distinct courses of study; namely, (1) a four-years course leading to the degree of Bachelor of Science in Commerce; (2) a two-years vocational course leading to a Certificate. The practical side of every subject is especially emphasized, the constant aim being to train the student for service and efficiency.

The Degree Course. In the degree course freshmen may choose as a major either accounting or secretarial studies, the latter including stenography and office practice. In the junior year, the student may further select a major course from one of the following: (1) Accounting and Business Management, (2) Economics and Sociology, (3) Government and Business Law, (4) Secretarial Studies. Instead of the above options, a liberal range of general electives is offered, so that in the junior or senior year the men may elect courses in Agriculture, Forestry, or Industrial Arts, while the women may elect courses in Home Economics.

The Vocational Course. This course has been arranged primarily for the benefit of persons who have been unable to finish a high-school course. The only entrance requirements are that the applicant must have had an eighth-grade education, or its equivalent, and must be at least eighteen years of age. The student may emphasize bookkeeping and business methods, or stenography and typewriting; or he may have an opportunity to take both courses.

Departments. For administrative purposes, the School of Commerce is organized into four distinct departments: (1) Accounting and Business Management, (2) Economics and Sociology, (3) Government and Business Law, and (4) Stenography and Office Training.

REQUIREMENTS FOR GRADUATION IN THE SCHOOL OF COMMERCE

For graduation in the school of Commerce a total of 136 college credits must be completed by men, and 132 credits by women. It is expected that the suggested schedule as listed elsewhere for

this school will be closely followed. Before graduation a student must complete credits as indicated in the following groups:

General group, such as English, Modern Language, etc., at least 22 credits.

Natural Science group at least 6 credits.

Commerce group at least 66 credits, as follows: Accounting and Business Management 21; or Office Training 21; Economics 21; Government and Business Law 18; Business English 6.

Mathematics group at least 3 credits.

Gymnasium 2 credits for men; 6 credits for women.

Military Science 2 credits for men.

Military Drill 6 credits for men.

Free Electives 29 credits.

DEGREE COURSE IN COMMERCE

Accounting and Business Management

	Semester	
	1st	2nd
Freshman Year		
Accounting (Com. 100, 101)*.....	4	4
Typewriting (Com. 410, 411).....	2	2
Advanced Commercial Correspondence (Eng. 143) or Modern Language	3	
Technical Business English (Eng. 142) or Modern Language		3
Commercial Geography (Com. 200).....	3	
Economic History of Europe (Com. 208).....		3
Commercial Mathematics (Math. 8).....	3	
Contemporary American History (Hist. 62).....		3
Library Practice (Libr. 1).....		½
Hygiene (Phys. Ed. 10 for Women, 19 for Men).....	½	
Gymnasium (Phys. Ed. 15, 16) for Men.....	½	½
Gymnasium (Phys. Ed. 5, 6) for Women.....	(1)	(1)
Drill (Military 3, 4).....	1	1
	<hr/> 17	<hr/> 17

* Students who have not had at least one year of bookkeeping should register for Com. 107 the first semester and Com. 100 the second semester.

	Semester	
	1st	2nd
Sophomore Year		
Accounting (Com. 102, 103).....	3	3
Modern Eng. Prose (Eng. 81, 82) or Modern Language....	3	3
Economic History of the United States (Com. 206).....	3	
Principles of Economics (Com. 210).....		3
Advanced Business Law (Com. 309, 310).....	3	3
History of Oregon (Hist. 70)*.....	3	
Modern European History (Hist. 40)*.....		3
Business Men's Lecture Course (Com. 140, 141).....	1	1
Gymnasium (Phys. Ed. 17, 18) for Men.....	$\frac{1}{2}$	$\frac{1}{2}$
Gymnasium (Phys. Ed. 7, 8) for Women.....	(1)	(1)
Drill (Military 3, 4).....	1	1
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

* Optional with Science: Six credits in sciences are required for graduation. The following are recommended: Chemistry 100, 101; Physics 1, 2; Bact. 101; Zoology 204; or Botany 20. Students who plan to minor in Home Economics are urged to register for the required chemistry in their freshman or sophomore year. (Household Chemistry 12 and 13, 6 credits.)

Stenography and Office Training

	Semester	
	1st	2nd
Freshman Year		
Stenography (Com. 400, 401).....	3	3
Typewriting (Com. 410, 411).....	2	2
Accounting (Com. 100, 101)*.....	4	4
Advanced Commercial Correspondence (Eng. 143) or Modern Language	3	
Technical Business English (142) or Modern Language....		3
Commercial Geography (Com. 200).....	3	
Contemporary American History (Hist. 62).....		3
Library Practice (Libr. 1).....		$\frac{1}{2}$
Gymnasium (Phys. Ed. 5, 6) for Women.....	(1)	(1)
Hygiene (Phys. Ed. 10 for Women, 19 for Men).....	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16) for Men.....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
	<hr/> 17	<hr/> 17

* Students who have not had at least one year of bookkeeping, should register for Com. 107 (3 credits) the first semester, and Com. 100 the second semester.

	Semester	
	1st	2nd
Sophomore Year		
Stenography (Com. 402, 403).....	3	3
Modern English Prose (Eng. 81, 82) or Modern Language.....	3	3
Economic History of U. S. (Com. 206).....	3	
Principles of Economics (Com. 210).....		3
Advanced Business Law (Com. 309, 310).....	3	3
History of Oregon (Hist. 70)*.....	3	
Modern European History (Hist. 40)*.....		3
Gymnasium (Phys. Ed. 17, 18) for Men.....	$\frac{1}{2}$	$\frac{1}{2}$
Gymnasium (Phys. Ed. 7, 8) for Women.....	(1)	(1)
Drill (Military 3, 4).....	1	1
Business Men's Lecture Course (Com. 140, 141).....	1	1
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

*Optional with Science (see requirements for graduation), or with second year in Accounting.

Freshman Year, Second Semester Registration

	Semester	
	1st	2nd
Bookkeeping (Com. 107).....		3
Modern English Prose (Eng. 81).....		3
Advanced Commercial Correspondence (Eng. 143).....		3
Economic History of Europe (Com. 208).....		3
Principles of Economics (Com. 210)*.....		3
Typewriting (Com. 410).....		2
Gymnasium (Phys. Ed. 16) for Men.....		$\frac{1}{2}$
Drill (Military 4).....		1
	<hr/>	<hr/>
		18 $\frac{1}{2}$

* Optional with Stenography (Com. 400).

	Semester	
	1st	2nd
Junior Year*		
Money and Banking (Com. 230).....	3	
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Business Organization and Management (Com. 110).....	3	
Advertising and Selling (Com. 112).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Practical Sociology (Com. 250).....		3
Free Electives (6-6) (See groups).....	6	6
	—	—
	17	17
Senior Year*		
Public Finance (Com. 233).....	3	
Transportation (Com. 240).....		3
Comparative Study of Governments (Com. 325).....	3	
International Relations (Com. 302).....		3
Free Electives (10-10) (See groups).....	10	10
	—	—
	16	16

* The junior and senior schedules may be modified to suit the individual student, provided, that the entire course shall contain not less than 66 nor more than 75 credits in professional subjects, and not less than 39 nor more than 61 credits in non-professional subjects.

VOCATIONAL COURSE IN COMMERCE

	Semester	
	1st	2nd
First Year		
Vocational English (Eng. G, H).....	3	3
U. S. History (Hist. D).....	3	
Civics (Com. N).....		3
Penmanship (Com. U, V).....	2	2
Commercial Arithmetic (Math. M, N)*.....	3	3
Bookkeeping (Com. 107)	3	
Principles of Accounting (Com. 100).....		4
Typewriting (Com. 410-411).....	2	2
Gymnasium (Phys. Ed. 11, 12) for Men.....	½	½
Gymnasium (Phys. Ed. 5, 6).....	(1)	(1)
Drill (Military A, B).....	1	1
	—	—
	17½	18½

* Optional with Stenography (Com. 400, 401).

Second Year	Semester	
	1st	2nd
Advanced Vocational English (Eng. I, J)*	3	3
Business English (Eng. M, N)	3	3
Principles of Accounting (Com. 101, 102)	4	3
Elementary Commercial Geography (Com. H)	2	
Elementary Industrial History (Com. K)		2
Business Law (Com. P)		3
Elementary Industrial Problems (Com. J)	3	
Penmanship (Com. W, X)	1	1
Gymnasium (Phys. Ed. 13, 14) for Men	$\frac{1}{2}$	$\frac{1}{2}$
Gymnasium (Phys. Ed. 5, 6) for Women	(1)	(2)
Drill (Military C, D)	1	1
	<hr/> 17 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$

* Optional with Stenography (Com. 402, 403).

CIVIL SERVICE COURSE

To meet the urgent demand for stenographic and clerical help during the war, an intensive course in Stenography and Office Training has been arranged. The course may be begun either semester. The entrance requirements are the same as for the Vocational Course.

Beginning Civil Service	Either Semester
Elementary Stenography (Com. 406)	6
Elementary Typewriting (Com. 415)	4
Business English (Eng. 143)	3
Accounting (Com. 107 or 100)	4
Gymnasium (Phys. Ed. 5) for Women	(1)
Gymnasium (Phys. Ed. 15) for Men	$\frac{1}{2}$
Drill (Military A)	1
	<hr/> 18 $\frac{1}{2}$

Advanced Civil Service

Either Semester

Advance Civil Service Stenography and Typewriting	
(Com. 407)	6
Technical Business English (Eng. 142).....	3
Penmanship (Com. U).....	2
Accounting (Com. 100 or 101).....	4
Gymnasium (Phys. Ed. 6) for Women.....	(1)
Gymnasium (Phys. Ed. 16) for Men.....	$\frac{1}{2}$
Drill (Military B).....	1
	<hr/>
	16 $\frac{1}{2}$

SUGGESTED ELECTIVE GROUPS

While the student may choose other subjects than those enumerated below, he is strongly urged to adopt one of the suggested groups.

Group 1. Accounting and Business Management

	Semester	
	1st	2nd
Junior Year		
Commercial Pharmacy (Phar. 160).....	3	
Labor Problems (Com. 213).....		3
Practical Public Speaking (Eng. 105, 106).....	3	3
	<hr/>	<hr/>
	6	6
Senior Year		
Accountancy Problems (Com. 105).....		3
Public Accounting and Auditing (Com. 106).....	3	
General Psychology (Ind. Ed. 101).....	3	
History of Education (Ind. Ed. 120).....		3
Economic Organization of Agriculture (Com. 264).....	3	
Insurance (Com. 235).....		3
Thesis (Com. 111).....	1	1
	<hr/>	<hr/>
	10	10

Group 2. Economics and Sociology

Junior Year		
American Literature (Eng. 71, 72) or.....	3	3
Modern Language		
Cooperation (Com. 260).....		3
Science	3	
	<hr/>	<hr/>
	6	6

	Semester	
	1st	2nd
Senior Year		
Accountancy Problems (Com. 105).....		3
Public Accounting and Auditing (Com. 106).....	3	
Insurance (Com. 235)		3
Practical Public Speaking (Eng. 105).....	3	
General Psychology (Ind. Ed. 101).....	3	
History of Education (Ind. Ed. 120).....		3
Thesis (Com. 111).....	1	1
	—	—
	10	10

Group 3. Government and Business Law

Junior Year		
History of English Literature (Eng. 61, 62).....	3	3
Economic Organization of Agriculture (Com. 264).....	3	
Insurance (Com. 235).....		3
	—	—
	6	6

Senior Year		
Advanced American Government (Com. 304).....	3	
Practical Legislation (Com. 328).....		3
History of the British Empire (Hist. 52).....	3	
American Diplomatic History (Hist. 80).....		3
Accountancy Problems (Com. 105).....		3
Public Accounting and Auditing (Com. 106).....	3	
Thesis (Com. 111)	1	1
	—	—
	10	10

Group 4. Teachers' Course

Junior Year		
General Psychology (Ind. Ed. 101).....	3	
Educational Psychology (Ind. Ed. 102).....		2
Principles of Education (Ind. Ed. 131).....	3	
History of Education (Ind. Ed. 120).....		3
Thesis (Com. 111).....	1	1
	—	—
	6	6

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	Semester	
	1st	2nd
Senior Year		
Special Methods (Ind. Ed. 180, 181).....	2	2
Business Organization and Management (Com. 110).....	3	
Labor Problems (Com. 213).....		3
Approved Electives	5	5
	—	—
	10	10

Group 5. Minor in Agriculture

Junior Year		
Soils (Soils 1).....	3	
Crop Production (Farm Crops 1).....		3
Approved Electives	3	3
	—	—
	6	6
Senior Year		
Stock Judging (A. H. 1).....	2	
Live Stock Management (A. H. 2).....		3
Plant Propagation (Hort. 105).....		2
Orchard and Garden Practice (Hort. 103).....	2	
Approved Electives	6	5
	—	—
	10	10

Group 6. Minor in Home Economics

Junior Year		
Food Preparation (H. S. 106)*.....	4	
Food Preparation (H. S. 107).....		4
Approved Electives	2	2
	—	—
	6	6
Senior Year		
Textiles and Clothing (H. A. 104).....	4	
Textiles and Clothing (H. A. 105).....		4
Approved Electives	6	6
	—	—
	10	10

* Students who plan to minor in Home Economics are urged to register for the required Chemistry in their freshman or sophomore years. (Household Chemistry 12 and 13, 6 credits.)

Group 7. Office Training

	Semester	
	1st	2nd
Junior Year		
Office Training for Stenographers (Com. 412).....	3	
Secretarial Training for Stenographers (Com. 413).....		3
Approved Electives	3	3
	<hr/>	<hr/>
	6	6
Senior Year		
Reporters' Course (Com. 404).....	2	
Reporters' Course (Com. 405).....		2
Approved Electives	8	8
	<hr/>	<hr/>
	10	10

Group 8. Minor in Physical Education for Women *

Junior Year		
Theory of Gymnastics (Phys. Ed 41, 42).....	2	2
Massage (Phys. Ed. 47, 48).....	1	1
Physical Exam. and Prescription (Phys. Ed. 49, 50).....	1	1
Physical Education—Practice.....	2	2
	<hr/>	<hr/>
	6	6
Senior Year		
Methods and Practice Teaching (Phys. Ed. 51, 52).....	2	2
Playground (Phys. Ed. 53).....		2
Home Nursing (H. S. 511).....		3
General Psychology (Ind. Ed. 101).....	3	
Basketry (H. A. 402).....	2	
Story Telling (Eng. 192, 193).....	1	1
Physical Education—Practice.....	2	2
	<hr/>	<hr/>
	10	10

* Note: Prerequisites for this course are Zoology, Physiology and Anatomy (201, 202).

COURSE IN FARM BUSINESS AND RURAL LEADERSHIP

For the prescribed group courses for the freshman and sophomore years see Degree Courses in Agriculture, Group I, General Catalogue, pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Economic History of the U. S. (Com. 206).....	3	
Rural Finance (Com. 265).....		3
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Genetics (Zool. 120).....	3	
Practical Sociology (Com. 250).....		3
Cooperative Accounting and Management (Com. 130).....	3	
Dairy Herd Management (D. H. 40).....		3
Soil Fertility (Soils 7).....	4	
Feeds and Feeding (A. H. 23).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	—	—
Senior Year		
Public Finance (Com. 233).....	3	
Comparative Governments (Com. 325).....	3	
Economic Organizations of Agriculture (Com. 264).....	3	
Rural Sociology (Com. 252).....		3
Literature and Exposition of the Rural Life (Com. 255).....	3	
Farm Management (Farm Mgt. 1).....		3
Forage Crops (Farm Crops 9).....	2	
Elementary Laboratory Bacteriology (Bact. 102).....		2
Practical Pomology (Hort. 102).....	2	
Approved Electives		8
	—	—
	16	16

COURSE IN MARKETING AND RURAL ORGANIZATION

	Semester	
Freshman Year	1st	2nd
Business English (Eng. 143, 142).....	3	3
Modern Language	3	3
Commercial Geography (Com. 200).....	3	
Economic History of Europe (Com. 208).....		3
Science	3	3
Commercial Mathematics (Math. 8).....	3	
Accounting (Com. 107).....		3
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
	<hr/>	<hr/>
Sophomore Year	17 $\frac{1}{2}$	16 $\frac{1}{2}$
Advanced Business Law (Com. 309, 310).....	3	3
Modern Language (Continuation).....	3	3
Economic History of United States (Com. 206).....	3	
Principles of Economics (Com. 210).....		3
Soils (Soils 1, 2).....	3	3
Accounting (Com. 103).....	4	
Office Training (Com. 410).....		4
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 5, 6).....	1	1
	<hr/>	<hr/>
Junior Year	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Business Management (Com. 110).....	3	
Farm Crops (Farm Crops 1).....		3
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Practical Public Speaking (Eng. 105, 106).....	3	3
Farm Management (Farm Mgt. 1).....	3	
Elements of Dairying (D. H. 1).....		3
Animal Husbandry, Stock Judging (A. H. 1).....	2	
Live Stock Management (A. H. 2).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/>	<hr/>
	16	17

Senior Year	Semester	
	1st	2nd
Markets and Marketing (Com. 283, 284).....	3	3
Economic Organization of Agriculture (Com. 264).....	3	
Rural Finance (Com. 265).....		3
Transportation (Com. 240).....		3
Insurance (Com. 235).....		3
Electives	11	5
	—	—
	17	17

ACCOUNTING AND BUSINESS MANAGEMENT

JOHN ANDREW BEXELL, Professor
JOHN B. HORNER, Professor of History
ERWIN BERTRAN LEMON, Assistant Professor
RUSSEL MARION HOWARD, Instructor

The distinctive work of the department of Accounting and Business Management in the School of Commerce is to train men and women for efficient business management. This includes thorough courses in the various phases of Accounting, Auditing, Business Organization, Scientific Management, Advertising, and Salesmanship.

While the courses in Accounting and Business Management are primarily designed to fit students for the countinghouse and business office, including banking, it is found that such positions are generally only stepping stones to more advanced positions of trust and responsibility. A large percentage of the commercial students eventually engage in business of their own.

The School of Commerce has taken a leading part in developing courses in business methods especially adapted to the farm, the home, and cooperative enterprises. Such courses are given not only in residence but also by correspondence.

When it is remembered that every vocation has its business side, and that this phase of all pursuits is receiving increasing attention, it is apparent that the avenues of employment and the chances for promotion by the really competent business expert are almost unlimited. As a preparation for law or public accounting, this course, combined with economics and political science, is especially attractive. A large proportion of the graduates in Commerce find employment as teachers of commercial subjects in state and private schools; to them the courses in business management are very important.

Equipment. The department of Accounting and Business Management occupies the top floor of the east wing of Agricultural Hall. It is completely equipped for thorough and efficient work in modern business courses. Each room is specially designed and furnished for the work to be conducted in it. The furniture of the department consists of individual desks and counters, a complete set of modern banking fixtures, a wholesale house, a retail house, a commission house, freight, real estate, and insurance offices. Permanent blank books, letter files, rubber stamps, copying presses,

blanks and similar material are provided by the College. A Burroughs Adding Machine is in constant use in the department. The room for typewriting contains fifty-five standard machines, each provided with approved conveniences for the operator. The office training laboratories are furnished with desks designed for convenience in practical work, and contains a variety of equipment for illustrating various systems of filing.

COURSES IN ACCOUNTING AND BUSINESS MANAGEMENT

For outline of courses in Accounting and Business Management consult pages 180-181.

The following courses are offered:

100. Principles of Accounting. Modern accounting as practiced in the best business establishments of the country, forms the basis of the course. The use of special columns, controlling accounts, and their adaptations, is carefully studied. Labor-saving devices of all kinds are studied with a constant view to secure greater accuracy and to diminish work. A great deal of practice in retail, wholesale, and commission accounting, and the preparation and interpretation of financial statements is required. In connection with partnership accounts, a careful study is made of opening and closing entries; adjustments of profits and losses; consolidation of firms; changing from partnership to single proprietorship, and vice versa. The practical side of every phase of the course is emphasized by various sets of books which the student prepares under the supervision of the instructor.

Prerequisite: Course 107 or equivalent. Commerce; *freshman year; Vocational Course, first year; either semester; 4 credits; 3 recitations; 3 laboratory periods. Fee \$1.00. Text: 20th Century Bookkeeping and Accountancy.

101. Practical Accounting. (a) **Corporation Accounts.** A presentation of the theory of manufacturing bookkeeping and the preparation of a set of books illustrating corporation bookkeeping as applied to manufacturing business. (b) **Bank Accounting.** A thorough course in modern bank accounting. The organization of private, state, and national banks, trust companies, and other financial institutions. (c) **Short Accounting Systems.** A further

* Freshmen who have not had one year of bookkeeping should register for course 107.

study of the use of special column books and filing devices, with reference to the saving of time and labor in bookkeeping, as applied to modern business houses. The practical work also consists of the preparation of sets of books illustrating the principles involved.

Commerce; freshman year; Vocational Course; second year; either semester; 4 credits; 3 recitations; 3 laboratory periods. Prerequisite: Course 100 or equivalent. Fee \$1.00. Text: A large number of practical problems and exercises selected from various sources.

102. Accounting and Business Practice (a) **Theory of Accounting** including depreciation, reserves, and investment accounting; advanced form of final statements; the statement of affairs and deficiency account; realization and liquidation. (b) **Business Practice**. The business practice course is designed to supplement all the theoretical courses and to develop initiative and originality. The offices are thoroughly equipped with modern labor-saving appliances, such as filing devices, loose-leaf books, adding machines, duplicating devices, etc. U. S. Office of Markets, Elevator Accounting and Organization of Cooperative Enterprises.

Prerequisite: Course 101. Commerce; sophomore year; Vocational; second year; either semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Texts: Klein, Elements of Accounting. U. S. D. A. Bulletins.

103. Cost Accounting. This course covers the broader economic phases of accounting. Emphasis is laid on accounts as a means of administrative control and economy of production. (a) **Theory of Cost Accounting**. The elements of costs; cost and stock records; relation of cost accounts to the financial records; distribution of overhead; cost statements; graphical representation of costs. (b) **Factory Costs**. A laboratory course especially adapted to a manufacturing business with a considerable pay-roll. (c) **Farm Costs Accounts**. A system of cost accounts adapted to the farm or any productive enterprise.

Prerequisite: Course 102. Commerce; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Wildman, Principles of Cost Accounting. Rowe, Cost Accounting.

105. Accounting Problems. In the efficient administration of a business of some magnitude, the accounting department is of first importance. In it, difficult problems arise, which require not

only accounting skill, but judgment and executive ability. This course covers a large variety of practical problems viewed from the standpoint of the manager rather than the accountant. The material is drawn from certified public accountancy examinations and other sources. The student does not follow any prescribed form of treatment or solution, but is expected to develop analytical initiative, resourcefulness, and originality.

Prerequisite: Course 103. Elective; senior year; second semester; 3 credits; 3 recitations; 1 laboratory period. Text: Cox, C. P. A. Problems. Original Exercises.

106. Public Accounting and Auditing. (a) **Public Accounting.** This course embraces a study of accountancy as a vocation; the C. P. A. laws of the various states are studied and compared; an analysis and interpretation of accounts and financial statements; terminology and procedure in public systems form an important part of this course. (b) **Auditing.** The duties and responsibility of the auditor; his function in the executive staff; his relation to the accounting department; different classes of audits; investigation in the conduct of utility corporations, municipalities, and public institutions. Typical audits will be studied and compared.

Prerequisite: Course 105. Elective; senior year; first semester; 3 credits; 3 recitations; 1 laboratory period. Text: Montgomery, Auditing in Principle and Practice. Harvard Bulletins.

107. Bookkeeping. A thorough but rapid study of the general principles of bookkeeping. The aim of this course is twofold; first, to prepare the student for the study of an advanced set of books adapted to his particular vocation; second, to afford those students entering the Vocational or Degree Courses in Commerce who have not had a year of bookkeeping an opportunity to secure additional instruction which will enable them to carry Course 100.

Commerce; freshman year; Vocational course; first year; either semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: 20th Century Bookkeeping and Accountancy.

108. Special Accounting. In this course the student is given an opportunity to apply the principles of accounting to his special needs, the course being designed primarily for engineering students. Cost accounting, and corporation accounts and statements receive special attention.

Prerequisite: Course 107 or equivalent. Electrical Engineering Course (elective to others); freshman year; second semester; 1 recitation; 2 laboratory periods.

109. Farm Accounting and Business Methods. (a) **Farm Accounting.** This part of the course consists of a thorough discussion of a system of accounts suited to the farm. Cost accounting is especially emphasized, with a view to determining the results of different enterprises. (b) **Business Organization.** Individual proprietorship, partnership, joint-stock companies, and corporations are carefully studied and their adaptations discussed from the standpoint of efficiency; the status of stockholders; the rights and obligations of bondholders; and the functions of officers and directors are treated in detail.

Agriculture; freshman year; first semester; 2 credits; 2 recitations. Texts: Bexell and Nichols, Principles of Bookkeeping and Farm Accounts. Robinson, Organizing a Business.

110. Business Organization and Management. (a) **Business Organization.** General nature of business organization; evolution and forms; structure and life-history of typical corporations; the corporation and trust problem; public utility corporations; reorganization and receivership; blue sky laws and state control. (b) **Parliamentary Practice.** A brief discussion of parliamentary practice and procedure as applied to corporate business. (c) **Business Management.** This part of the course emphasizes internal organization for the purpose of securing efficiency; departmental organization and coordination; various systems of scientific management are studied and compared.

Commerce; junior year; first semester; 3 credits; 3 recitations. Texts: Haney, Business Organization. Gowin, The Executive and His Control of Men. Babson's Reports.

111. Thesis. A research course and treatise on the organization and management of a business in which the student is especially interested. The subject of the thesis must be chosen at the time of registration, and a complete outline approved by the professor in charge not later than November 1. When the thesis is approved, a bound (either printed or typewritten) copy must be deposited in the College library.

Prerequisite: All College courses in Accounting and Business Management. Open only to seniors; both semesters; 1 credit each semester.

112. Purchasing and Selling. (a) **Purchasing.** Principles of purchasing; relations of buying to successful merchandising and manufacturing; ethics of buying; the purchasing organization; records of purchasing; stores, their function and operation; mar-

kets; agents; brokers; jobbers; wholesalers; transportation; reports and statistics. (b) **Advertising.** A study of the fundamental principles of modern advertising. Special emphasis is given to the peculiarities of composition in newspaper and circular advertising, proof reading, effectiveness of design, illustration and display, follow-up systems, etc. (c) **General Principles of Salesmanship.** Business ethics; wholesaling and retailing; brokerage and commission; specialty selling; the sale of service; planning a selling campaign; special sales; prices; correct buying.

Commerce; junior year; second semester; 3 credits; 3 recitations. Texts: Twyford, Purchasing. Neystrom, Retail Selling. Babson's Reports.

120. Household Accounts. A course dealing with the business side of the household. The family income and its distribution; the planning of the annual budget; a simple but complete system of household accounts based on the budget; private accounts as a basis for encouraging thrift among members of the family; bank accounts and their relation to household finance; savings and how they grow.

Home Economics; sophomore year; first semester; 1 credit; 1 recitation. Not given in 1918-19.

122. Business Management for Women. The aim of this course is to treat in a practical way the ordinary rules and methods of conducting business affairs. Two distinct phases are emphasized as follows: (a) **Finance.** Value of money, how savings grow, banking and credit, general principles of investment, loan associations, bonds, stocks, and insurance. (b) **Fundamentals of Business Law.** The principles of the law of contracts, of negotiable paper, mortgages, real property, and wills.

Home Economics; elective to juniors and seniors; second semester; 2 recitations. Text: Cromwell, American Business Woman.

130. Accounting and Management of Cooperative Enterprises. This course covers the business management of cooperative societies. It includes such subjects as the organization of the employees; structure of buildings; office arrangement and equipment; correspondence and filing; bookkeeping and cost accounting especially adapted to different types of cooperative associations in the United States, such as creamery associations, cow-testing associations; auditing, banking, and finance; purchasing, advertising, selling; depreciation of assets; conduct of membership meetings; annual reports and audits; statistical analysis of operations.

Farm Management; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Texts: Robinson, Organizing a Business. U. S. Bureau of Markets Bulletins.

140. Business Men's Lectures and Reading. (a) **Lectures.** A series of lectures on practical business subjects will be given during the year by prominent business men of the State. (b) **Reading.** An assignment of reading will be made at the beginning of the semester covering such phases of the lectures as are best suited to the needs of individual students. (c) **Parliamentary Practice.** A thorough study of parliamentary law and procedure with much practice in organizing and conducting deliberative assemblies.

Commerce and Elective; sophomore year; first semester; 1 credit; 1 recitation. Text: Gregg, Parliamentary Law.

141. Business Men's Lectures and Reading. A continuation of course 140. Second semester; 1 credit.

150. Forestry Accounting. (a) A brief, intensive study of the fundamental principles of double-entry accounting. The theory of debit and credit, labor-saving features, controlling accounts and their adaptations. The purpose of this course is to give the student the necessary foundation for the second part of the course, which deals with the lumber industry.

(b) This part of the course will consider especially those systems of accounts, forms, and records, which are adapted to the lumber industries. Cost accounting and statements receive especial attention. It is not intended to make of the student a professional accountant, but rather to teach him accounting as a means of control and the proper methods of analyzing the different operations connected with the business.

Logging Engineering; freshman year; elective second semester; three credits; 2 recitations; 1 laboratory period.

160. Military Business Practice. A study of the business methods and accounting in the United States Army as represented by its blanks and forms, and the regulations governing the use of the same. The business methods of the Supply and Adjutant General Department will be analyzed and compared with those used in civil life. Considerable outside reading will be required to obtain credit in this course.

Open to all juniors and seniors; second semester; 2 credits; 2 recitations.

D. Dairy Accounting. The same general course as E, except that in the last third of the course special attention will be given

to the development of a system of accounts suited to the dairy business.

Dairy Vocational Course; second semester; 3 credits; 2 recitations; 1 laboratory period. Texts: Bexell and Nichols, Principles of Bookkeeping and Farm Accounts. I. C. S., Cost Accounting. Robinson, Organizing a Business.

E. Farm Accounting and Business Methods. (a) **Accounting.** Students who are not acquainted with the elements of double-entry bookkeeping will be required to work out several practice sets and master the theory of accounts before taking up farm accounting. (b) **Business Methods.** A thorough course in the essentials of business methods required on a well-managed farm. Financial accounts and statements, cost accounts and special records, business methods, business organization, business correspondence and forms; household and personal accounts.

This course may also be taken by correspondence.

Agriculture; Vocational Course; second semester; 3 credits; 3 recitations. Texts: Bexell and Nichols, Principles of Bookkeeping and Farm Accounts. Robinson, Organizing a Business.

F. Shop Accounting. A course in the theory and practice of accounting especially adapted to the shop. Sufficient time is devoted to the fundamental principles of bookkeeping to familiarize the student with the use of special columns and various labor-saving devices. A special set of books adapted to the shop is then studied and prepared, making the course exceptionally practical.

Mechanic Arts; third year; second semester; 2 credits; 2 recitations. Text: Miners, Bookkeeping. Original exercises.

U. Penmanship. Students entering the first year are expected to have acquired a good hand in the grades, but considerable time is devoted during the first year to mastering the best form of business writing and lettering.

Vocational Course; first year; either semester; 2 credits; 2 recitations.

V. Penmanship. A continuation of Course U.

Vocational Course; first year; second semester; 2 credits; 2 recitations.

W. Advanced Penmanship. Special emphasis is laid on rapid business writing, correct forms of business papers, lettering, and designing.

Vocational Course; second year; first semester; 1 credit; 1 recitation.

X. Advanced Penmanship. A continuation of Course W. Second semester; 1 credit; 1 recitation.

ECONOMICS AND SOCIOLOGY

Markets and Rural Organization

HECTOR MACPHERSON, Professor
NEWEL HOWLAND COMISH, Associate Professor
_____, Instructor

The work of this department of the School of Commerce serves a three-fold purpose:

(1) **To train both men and women for citizenship.** Every citizen has business relations requiring a knowledge of the fundamental principles of political economy. Then, too, the necessity of such knowledge is especially felt in a democracy where every man and woman has the right to vote, and is called upon to mold legislation directly. The basis for intelligently exercising this paramount duty of citizenship can only be supplied by a training in economics and sociology the problems of which form the subject matter of all legislation.

(2) **To provide courses supplementary to the various branches of applied science.** To the agricultural college belongs the special task of developing the field of Agricultural Economics and Rural Sociology. It is the aim of this department to provide the necessary training for teachers in these subjects, to prepare specialists for research work in economic and social surveys of rural communities, and to equip those who will make a life work of organizing farmers' associations for the more economical conduct of the business side of farming.

(3) **To do field work.** The Bureau of Organization and Markets. At its meeting October 9, 1914, the Board of Regents established the Bureau of Organization and Markets for the purpose of assisting farmers in the marketing of their products.

The work of the bureau is, in the first place, investigational. It aims to find out the conditions fundamental to successful marketing, and to place the results of its investigation at the disposal of all who are interested.

In the second place, it is at the service of any group of farmers contemplating the establishment of any sort of business organization. It has worked out model constitutions and by-laws and standardized systems of accounting; it has lists of equipment and can guide the farmers to where such equipment can be most

cheaply obtained. It will also assist organizations in planning the kind of plants necessary to carry on their business.

Equipment. The department has for some years been developing a commercial museum for use in the various courses in economic and social science. The museum has now grown to such an extent that it is a very important factor in making the department practical and successful. The films, pamphlets, lantern and Markets also has a collection illustrating the farmers' marketing and organization movement in all parts of the world.

GRADUATE COURSES IN AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

Courses will be outlined leading to the degree of Master of Science in Agricultural Economics and Rural Sociology. It is strongly recommended that students wishing to pursue this work, take the Agricultural course during their first two years in College, and that they follow the work outlined in the course in Farm Business and Rural Leadership on page 189, during their junior and senior years.

Students taking the regular Commercial course, who contemplate studying for a Master's degree in Agricultural Economics and Rural Sociology, should commence with their sophomore year to take certain courses in Agriculture which will be chosen in consultation with the deans of the schools of Agriculture and Commerce.

Our aim is to make the graduate work in this course fit students for County Agriculturists, positions in the U. S. Department of Agriculture, especially in the office of Markets and Rural Organization, teachers in rural high schools, and for Rural Leadership in general. Students will also be prepared for Civil Service examinations in this general field.

For outline of courses in Economics and Sociology in the School of Commerce consult pages 185-186.

The following courses are offered:

200. Commercial Geography. The fundamental conditions underlying all industry and all commerce are taken up in detail. First of all basic elements as climate and topography are investigated, as they mold transportation and commerce and the production of animal and vegetable products. Then the natural resources

of the different countries of the world are treated with especial emphasis upon those of the United States.

Specimens from the Commercial Museum will be used by the students in making reports on the production and manufacture of the country materials and their relation to the development of the country which they come. The course presupposes a fair knowledge of political geography and of general history.

Freshman Commerce, freshman Industrial Engineering, sophomore Mechanical Engineers; first semester; 3 credits; 3 recitations. Text: Smith, Commerce and Industry.

205. Economic History of the United States. This course follows and develops out of the previous work in Commercial Geography and the History of Commerce. On the basis of a knowledge of our natural resources and of the previous commercial and economic development of the world, we attempt to outline and interpret the economic progress along many lines which has been made by the United States. The development of agriculture, the growth of manufacturing, the improvement of transportation, the history of labor organization and legislation, the evolution of our monetary and credit systems, changes in the protective tariff, etc., are traced from Colonial times onward.

Prerequisites: Commerce 200, 205. Sophomore year; first semester; 3 credits; 3 recitations. Text: Bogart, Economic History of United States. Callender, Economic History of United States.

208. Economic History of Europe. The development of commerce from the time of the Phoenicians. The commercial achievements of some of the early nations. The industrial development of Great Britain, as a basis for the study of the United States, in course 206, including the rise and breaking down of feudalism, important changes in agriculture, Guild system, rise of the factory system, and its results, the market system, and England's present industrial position.

Freshman year; second semester; 3 credits; 3 recitations. Texts: De Gibbins, Industry in England. Bland, Brown and Lawney, Select Documents in English Economic History.

210. Principles of Economics. A general course covering the elementary problems of our industrial and commercial organization, including the nature of wealth, its production and consumption, and the different forms in which it is found; the conditions under-

lying its success in agriculture and manufacturing; the localization of industry and the relation of raw material to manufacturing; the law of diminishing returns; division of labor and efficiency in production; exchange and distribution and their dependence upon the price-making process, the factors determining prices, wages, interest, and rent; the problems of taxation; public expenditures; protection and free trade; money and banking; labor problems and transportation.

Textbook, lectures, and reports on assigned readings.

Prerequisites: 200 and 206. Forestry; junior year; first semester; Commerce and Engineers, sophomore year; second semester; 3 credits; 3 recitations. Text: Ely, Outline of Economics. Brown, Questionnaire and Syllabus.

211. Principles of Economics. A course especially adapted for students in Home Economics. Not open to Commerce students.

Home Economics; junior year; first semester; 2 credits; 3 recitations. Texts: Ely, Outline of Economics. Brown, Questionnaire and Syllabus.

213. Labor Problems. Begins with a brief historical review of the rise of a labor class. The influence of occupation upon the laborer; and the different types of labor and the problems involved in the occupations represented by the several technical departments of the College, will be studied. Then follows the beginnings of organization; the structure, aims, methods of offence and defence, and achievements of associations of labor. The trade agreement, the strike, the boycott, the lockout, methods of conciliation and arbitration, the application of the injunction in labor disputes, the political activity of labor organizations, employers' liability, legislation, workingmen's insurance, profit sharing and cooperation in relation to labor problems, will be taken up with the aid of a textbook, lecture, and assigned readings. Studies will be made of typical historical and current labor disputes and embodied in term papers and class discussion.

Prerequisite: Commerce 210. Commerce and Forestry; junior year; second semester; 3 credits; 3 recitations. Text: Groat, Organized Labor in America.

219. Agricultural Economics. The fundamental principles of production, distribution, and consumption are taken up with especial reference to agriculture. The aim of the course is to acquaint the student with the laws of supply and demand and the influences determining them. A brief history of agricultural production is

taken up, showing the growing complexity of the economic problems of taxation, transportation, marketing, etc., as the transition is made from self-sufficing, general farming to localized, commercial agriculture.

Agriculture; junior year; first semester; 3 credits; 2 recitations and one lecture (of sections combined).

230. Money and Banking. (a) **Money.** The nature and functions of money, legal tender, Gresham's law, coinage; the factors affecting prices, and their relation to business conditions; a brief history of the various forms of paper currency; silver legislation; present problems and conditions.

(b) **Banking.** Procedure in organizing state and national banks; history of banking, including our National Banking System as modified by the Federal Reserve Bank Act of 1913; the functions of banks; the preparation and analysis of bank statements; loans and the granting of credit, securities required; rediscount; duties of the various bank officers; legal principles of banking; the principles underlying foreign exchange; a comparison of our banking system with that of foreign countries.

Prerequisite: Commerce 210. Commerce; junior year; first semester; 3 credits; 3 recitations. Text: Holdsworth, Money and Banking.

233. Public Finance. An examination will be made of public expenditures, local, state, and national. For this purpose, typical financial budgets and reports will be analyzed. A history of reforms calculated to secure efficiency in these expenditures will be sketched. The various forms of taxes, customs, and fees whereby revenues are raised, will be taken up in detail and their apportionment studied in relation to the budgets previously analyzed. Present systems of land taxation will be studied in the light of proposed reforms. An attempt will be made to give the student some laboratory practice through the study of local systems of assessment and the resulting apportionment of taxes.

Commerce; senior year; first semester; 3 credits; 3 recitations. Texts: Plehn, Introduction to Public Finance. Bullock, Selected Readings in Public Finance.

235. Insurance. A course designed to cover, in a general way, the whole field of insurance. The nature and statistical basis of different kinds of insurance will be first treated. Then the application of the principles discovered to different forms of insurance,

such as straight life, endowment, accident, industrial, old age, fire, live stock, hail, etc., will be taken up in detail.

Elective; junior and senior years; second semester; 3 credits; 3 recitations. Text: Assigned readings and lectures.

240. Transportation. The relation of transportation systems to industrial and commercial progress; a brief historical review of the development of systems of transportation; the organization and financing of different systems; the effects of competition in the railroad business; freight classification, and the making of rates and fares; the necessity of government control, and attempts at regulation by state and federal governments; government ownership in the light of European experience.

Senior year; second semester; 3 credits; 3 recitations. Texts: Ripley, Railroads; Rates and Regulations. Johnson and Huebner, Railroads; Rates and Traffic.

250. General Sociology. In this course, social theory will be subordinated to the study of practical social problems. The different social and political units, such as the family, school, church, club, city, state, and nation will be discussed in their relation to the general welfare. This will necessitate an examination of the organization, purpose, and methods of each of these functional groups, involving a discussion of the training of children, employment of women and children, marriage and divorce; the labor movement as a factor in the struggle for existence; overcrowding in city slums, and its amelioration; the causes of pauperism, immorality, and crime, with modern methods of their treatment, etc. A good general textbook will be studied and the whole field covered in class discussion and assigned readings.

Junior year; second semester; 3 credits; 3 recitations. Texts: Blackmar and Gillin, Outlines of Sociology. Carver, Sociology and Social Progress.

252. Rural Sociology. This course will deal with the special problems of the rural family, the rural school, the rural church, rural societies and associations, and the relation of the State to the general rural welfare. This will involve an inquiry into the prevailing ideals of the rural community regarding labor and leisure; art, literature, and music; and the necessity for recreation. Recent progress in adapting education to rural needs will be discussed. City over-crowding will be examined from the rural point of view, and the lessons which the rural community can learn from the progress made by cities in solving their problems, will be

emphasized. The social and educational effects of the telephone, free mail delivery, rural press, and improved methods of agricultural production and exchange, will be discussed in detail. The best textbooks in the field will be carefully studied, and the whole ground covered in class discussion and assigned readings.

Elective; junior and senior year; second semester; 3 credits; 3 recitations.

253. Applied Sociology. A problem course dealing with the application of the principles of sociology to social betterment. The juvenile court, the reform school, care of defectives, the application and effects of eugenics legislation, etc., will be investigated.

Open to students who have had either Commerce 250 or 252; first semester; 3 credits; 3 recitations.

254. National Vitality. A one-credit course, covering the general field of national vitality, its importance, the conditions underlying it and the means of maintaining such conditions. The economic and social waste due to disease, alcohol, and vice will be treated in a series of lectures by experts from different departments of the College. Outside specialists will also be secured to lecture upon particular phases of the subject. Besides taking notes on the lectures, each student will be required to make an abstract of not less than three hundred pages of assigned readings.

Elective for all students; first semester; 1 credit; 1 recitation.

Note: This course will not be given unless at least fifteen students register for it.

255. The Literature and Exposition of Rural Life. A critical study will be made of the general field of literature bearing upon rural life. Typical interpretations of rural life will be taken from the best poetry and prose. The rural press will be studied with a view to estimating its sociological and economic influence. Themes will be prepared upon current economic and sociological topics and the subject matter discussed in the class room to familiarize the student with the problems involved in the Rural Life movement.

Elective; junior and senior year; first semester; 3 credits; 3 recitations.

260. Cooperation. This course takes up the origin and development of the cooperative movement in Europe, and its introduction into the United States. It sets forth the general principles underlying the economic and social activities of cooperative associations. Then, following this, the different types of organization, the methods by which they are formed, their working plans in

different enterprises, and the factors which determine their success or failure, will be studied in detail. The store, the factory, the dairy and cow-testing association, the credit organization, etc., will be taken up systematically, and the advantages and difficulties of cooperation will in each case receive careful analysis.

Elective to juniors and seniors who cannot take Commerce 264 and 265, and who have had considerable training in Economics. First semester; 3 credits; 3 recitations.

264. The Economic Organization of Agriculture. This course, together with 265, is designed to give a more specialized training in the economic problems of agriculture than is possible in the general course outlined under 219.

In both courses, 264 and 265, economic problems are discussed from the standpoint of the efficiency to be attained through closer organization. Existing associations of farmers both in this country and in Europe will be carefully studied by means of sample constitutions and by-laws, and also by lantern-slide illustrations of the work actually being accomplished through cooperation in Europe and America. The aim is to turn out men trained to play their part in the revolution in agricultural business methods which is now sweeping over this country.

(a) **Economic Problems of Production and Marketing.** Old methods and their weakness are examined, and the possible savings through organized business are investigated.

(b) **The Purchase of Farm Supplies.** The purchasing end of the farm business is about as important as the selling of farm products. Present methods will be taken up in detail, and the possibility of eliminating waste and duplication thoroughly discussed and illustrated.

(c) **The Problems of Transportation as Affecting the Farmer.** The economic significance of the good roads movement will be dealt with; systems of rail and water transportation will be taken up, government control discussed, and the possibility of eliminating waste through precautions on the part of the shippers pointed out.

Open to all who have had 219 or its equivalent; elective for juniors and seniors; first semester; 3 credits; 3 recitations.

265. Rural Finance. (a) **Rural Credit.** The principles of money, credit, and banking will be sufficiently studied to lay the foundation for the examination of the credit needs of the rural

communities, and the most economical means of satisfying them. The reasons why farmers have been so poorly served by existing credit institutions will be investigated. The credit institutions of Europe will be compared with those of the United States; the development of cooperative credit in European countries will be carefully studied, and the present widespread movement to adapt cooperative credit institutions to American rural conditions will be closely followed; farm credit and land settlement; colonization policies.

(b) **Rural Insurance.** The basis of insurance of different kinds will be taken up, and applied to agricultural needs; old line, mutual, and fraternal organizations will be examined from the standpoint of efficiency and safety.

(c) **Rural Taxation.** The general principles of public finance will be taken up in so far as may be necessary to lay the foundation for an intelligent discussion of rural taxation; existing systems, as well as proposed reforms, will be examined.

Open to all who have had 219 or its equivalent; elective; junior and senior year; second semester; 3 credits; 3 recitations.

270. Problem Course. Students especially interested in Applied Economics may select some problem within the scope of the work characteristic of the College, and under the direction of the instructor in charge prepare a thesis embodying the results of an investigation made during the senior year.

Elective; senior year; both semesters; 1 credit (each semester); consultation by appointment.

280. The Economics of Distribution. A seminar covering the whole subject of the distribution of wealth, preparatory to graduate and thesis work in Agricultural Economics and Rural Sociology.

Open to graduate students who have had 219, 264, and 265 or an equivalent training.

281. The Economics of Distribution. Continuation of course 280. This course is required in order to receive credit for first semester's work.

Open to graduates who have had 219, 264, and 265 or equivalent training; both semesters; 3 credits; 3 recitations.

Note: This course will be given as a seminar by special arrangement.

283. Markets and Marketing. The development of marketing systems; the study of local, state, and national commercial programs and policies; commercial clubs, boards of trade, chambers of commerce, speculation organized and unorganized; foreign trade relations, the consular service, commercial treaties, tariffs, bounties, and foreign exchange.

Open to graduate students who have had Commerce 280. First semester; 3 credits; credit not given for one semester's work.

284. Markets and Marketing. Continuation of course 283. This course is required in order to receive credit for first semester's work.

Open to graduate students who have had Commerce 280, or equivalent work; both semesters; 3 credits; 3 recitations.

Note: This course will not be given in 1918-19 unless demand warrants it.

H. Elementary Commercial Geography. Especially adapted for Vocational students. A general survey will be made of the fundamental conditions affecting industrial and commercial development. This will be followed by a study of the natural resources, industries, products, and commerce of the United States, and each of the principal countries of the world. Emphasis will be laid upon the reasons for the organization of industry. Materials from the Commercial Museum will be used in connection with the course.

Vocational Mechanic Arts, second year; vocational Commerce, second year; first semester; 2 credits; 2 recitations.

I. Business and Social Organizations. A discussion of the principles of better business and better living that should accompany the general improvement in farm methods, which it is the purpose of this school to promote. The general application of the economic laws of consumption, distribution, and production to the business side of farming, and the social and economic results of agricultural organization will be studied by the aid of textbook, lectures, and assigned readings.

Vocational Agriculture; first semester; 3 credits; 3 recitations.

J. Elementary Industrial Problems. Especially designed for Vocational students in Industrial Arts and Commerce. It aims to give them some insight into the economic problems with which

they have to deal. A very condensed outline of the principal economic concepts will be followed by the discussion of industrial organization, labor problems, transportation, marketing, taxation, etc.

Vocational Mechanic Arts, third year; vocational Commerce, second year; first semester; 3 credits; 3 recitations.

K. Elementary Industrial History. A general but comprehensive review of the most important phases of the economic development of the United States. It will include a historical study of such topics as tariff, internal improvements, slavery, banking, industrial development, commerce and shipping, immigration and other similar topics, together with a study of present-day problems, as outlined in the press.

Vocational Mechanic Arts, second year; vocational Commerce, second year; first semester; 2 credits; 2 recitations.

GOVERNMENT AND BUSINESS LAW

ULYSSES GRANT DUBACH, Professor
CHESTER COLLINS MAXEY, Assistant Professor

In the courses in political science proper, the department seeks to instruct in the basic general principles of all government, the construction and operation of modern governments, with particular attention to that of the United States, the rules and principles which regulate the relations of governments with each other. The courses are planned with the purpose of equipping students for an intelligent participation in governmental affairs. The work culminates in the courses of Advanced American Government and Practical Legislation, designed to instruct in the fundamentals of law making. The work implies that as citizens, our students will take a dynamic part in the various activities of government, including law making.

The work of this department of the School of Commerce includes two divisions: business law, and government. In the business law courses, arranged to accommodate students of different preparation and needs, the department endeavors to train the students for practical business affairs, particularly to give the legal information necessary to prevent the common business errors. Special attention is given to industrial and rural problems.

In order to acquaint the student with the rudiments of court procedure, a practical case is tried by the class, the students performing all the parts.

For outline of courses in Government and Business Law in the School of Commerce consult pages 186-187.

The following courses are offered:

302. International Relations. Persons concerned, rights and duties of states; territorial jurisdiction; jurisdiction on the high seas; agents of the state treaties; settlements of disputes; war and its effects; military occupation; neutrality, contraband, blockades, etc. Lectures, reports, and discussions.

Senior year; second semester; 3 credits; 3 recitations. Text: Lawrence, Principles of Public International Law.

304. Advanced American Government. This course will supplement courses 320 and 322 giving chief attention to the interpretation of our federal and state constitutions, and the relation of

legislation to these constitutions. Court reports will be used liberally with a view to showing the interpretation of the rights of the people guaranteed in our constitutions and of the powers granted to the government by these instruments.

Prerequisite: Course 320. **Elective;** junior or senior year; first semester; 3 credits; 3 recitations. **Text:** Hall's Constitutional Law is used as a basis for the course. Case briefing is required as a large part of the work.

307. Rural Law. A special course supplementary to Commercial Law 300 and 301, elaborating on such questions as fixtures, fences and inclosures, roads, easements, location of land, titles, abstracts, mortgages, legal status of crops in case of termination of lease or sale of land, insurance, irrigation, drainage, and water rights in general.

Elective; junior or senior year; first semester; 1 credit; 1 recitation.

309. Advanced Business Law. (a) Contracts in General. Formation of contracts, offer, acceptance, form, and consideration; competence of parties, consent, and legality of subject matter; operation of contracts, including limit of obligations and assignments; interpretation, rules of evidence, and construction; discharge of contracts; the agreement, performance, breach of contract, etc.

(b) Sales of Personal Property. Subject matter, passage of title, rights of third parties, warranties and remedies.

Sophomore year; first semester; 3 recitations. **Text:** Spencer, Manual of Commercial Law. Bays, Cases on Commercial Law.

Note: Credit will not be given for Commerce 309 without Commerce 310 except on special permission of the department.

309-a. Class work same as 309, special research work required in addition. For graduate students only.

First semester; 3 credits; 3 recitations.

310. Advanced Business Law. Continuation of course 309.

(c) Negotiable Instruments. Maker's, acceptor's, drawer's and indorser's contracts; proceedings before, upon, and after dishonor; proceedings in protesting; accommodation paper; grantor and surety; holder's position, defense, equities, etc.

(d) Partnership and Corporation Law. Comparison of methods of formation, powers, liabilities of members, and dissolution.

(e) Property. Classes, methods of acquiring and transferring titles, mortgages, and leases, landlord and tenant.

The case method is used throughout the entire course. Lectures, reports, and discussions.

Sophomore year; second semester; 3 credits; 3 recitations. Text: Spencer, *Manual of Commercial Law*. Bays, *Cases on Commercial Law*.

310-a. Class work same as 310, special research work required in addition. For graduate students only.

Second semester; 3 credits; 3 recitations.

311. **Business Law.** A short course in the laws of business. Recitations and discussions.

Pharmacy and Farm Management students; second semester; 3 credits; 3 recitations. Text: Huffcut, *Elements of Business Law*.

320. **National Government.** (a) **National Government.** The Constitution; rise of the American Union; distribution and powers of the Government; powers of Congress; powers of the executive; the judicial departments; checks and balances of governments; governments of territories and colonies; admission of new states; amendments to the Constitution; civil rights and their guarantees; protection of persons accused of crimes; protection of contracts and property, etc. Lectures, readings, reports, and discussions.

(b) **American Politics.** Origin of political parties in the United States; changes, growth, and development; party platforms.

Junior or senior year; first semester; 3 credits; 3 recitations. Text: Beard, *American Government and Politics*. Young, *New American Government*.

322. **State and Municipal Government.** A study of the functions of state government; the machinery of state government; political parties in state government; special study of the government of the state of Oregon; municipal government, including county, town, and city government.

Lectures, readings, reports, and discussions. Junior or senior year; second semester; 3 credits; 3 recitations. Text: Beard, *American Government and Politics*. Young, *New American Government*.

325. **Comparative Governments.** A critical study of the governments of the principal countries of the world, with special emphasis on modern movements and features of government, that are problems in the United States at present.

Lectures, reports, and discussions. Senior year; first semester; 3 credits; 3 recitations. Text: Ogg, *European Governments*.

326. Practical Legislation. The work in Advanced American Government would serve as a preparation for this course which will instruct in practical bill drafting. Attention will be given to the correct form, and the correct expression of the desired content of bills. Emphasis will be placed on the necessity of preparing laws with reference to prior legislation and court decisions. In addition, an attempt will be made to show the necessity of studying conditions, and the possibility of guiding legislation to meet the demands of the times. Special emphasis will be placed on rural and industrial legislation.

Prerequisite: Course 304. Elective; junior or senior year; second semester; 3 credits; 3 recitations. Text: Jones, Statute Law Making in the United States.

P. Business Law. Adapted to students of limited training. A course covering the general principles of contracts, and particular contracts including sales of goods, bailment, insurance, credits, loans, negotiable instruments, agency, partnership, corporations, and property.

Vocational course; second year; and Mechanical Arts; third year; second semester; 3 credits; 3 recitations. Text: Huffcut, Elements of Business Law.

N. Civil Government and Administration. (a) **Civil Government.** Our European ancestors; origin of states and state institutions. English and American governments compared; federal and state constitutions; state and foreign service; the executive departments; federal and state power; political parties and issues.

(b) **Federal and State Administration.** A survey of the administrative activities of federal, state, and municipal governments; governments from the sociological point of view. The financial operations, preparation of budgets and reports, will be considered.

Vocational course; first year; second semester; 3 credits; 3 recitations. Text: Ashley, American Federal State.

STENOGRAPHY AND OFFICE TRAINING

ELMER WALKER HILLS, Professor
ETHA MABEL MAGINNIS, Instructor

Instructor

Instructor

The courses offered by this department of the School of Commerce are for four classes of students: (a) those desiring a thorough training as stenographers and typists; (b) those desiring to go still further into the field of court reporting and secretarial training; (c) those desiring to enter the teaching profession; and (d) those commercial teachers desiring advanced training.

The ground covered by the special subjects offered by this department is as follows: Stenography and Typewriting, two years; Convention and Court Reporting, one year; Secretarial Training, one year; and Methods of Teaching Commerce, one year.

Equipment. The Office Training department is well equipped with the latest appliances and fixtures, including the standard types of typewriters, duplicators, mimeographs, dictaphones, mimeoscope, and filing cabinets.

Each student is given access to equipment upon payment of a fee required for the course in which he is registered. All equipment and apparatus is kept in constant repair, and students are taught, under the direction of the instructors, how to keep the apparatus they use in proper order.

The following courses are offered:

400. Elementary Stenography. Gregg Shorthand. Theory of manual, first twelve lessons, covered thoroughly. Shorthand penmanship given special attention. Primary and Intermediate Certificates granted. Typing course 410 must be taken concurrently with this course, unless student has had an equivalent course.

Degree course, freshman year, and Vocational course, first year; either semester; 3 credits; 4 recitations. Texts: Gregg Shorthand Manual. Gregg Writer.

401. Elementary Stenography. A continuation of course 400. Theory of manual completed. Special attention given to phrase writing. Beginning dictation. Complete Theory Certificate granted. Typing course 411 must be taken concurrently with this course, unless student has had an equivalent course.

Degree course, freshman year, and Vocational course, first year; either semester; 3 credits; 4 recitations. Texts: Gregg Shorthand Manual. Gregg Speed Studies. Gregg Writer.

402. Advanced Stenography and Typewriting. Dictation covering vocabularies of representative businesses, such as real estate, law and collections, banking and finance, life and fraternal insurance, publishing, railway, manufacturing, and a drill in matter qualifying one to pass the United States Civil Service examination.

The typewriting periods will be utilized in transcribing matter which has been taken in dictation. The use of the dictaphone will be introduced as an aid to increasing speed both in stenography and typewriting. 80-, 100-, and 120-word speed certificates granted.

Degree course, sophomore year, and Vocational course, second year; first semester; 3 credits; 3 recitations; 4 laboratory periods of one hour each. Fee \$2.00. Text: Eldridge Dictation Exercises. Gregg Writer.

403. Advanced Stenography and Typewriting. A continuation of course 402. Court and convention reporting introduced. Dictaphone and Mimeograph work.

Degree course, sophomore year, and Vocational course, second year; second semester; 3 credits; 3 recitations; 4 laboratory periods of one hour each. Fee \$2.00. Text: Eldridge Dictation Exercises. Gregg Writer.

404. Reporters' Course. Designed for those having finished course 403 and desiring to specialize in court or convention reporting.

Elective; senior year; second semester; 2 credits; 2 lectures; 2 laboratory periods of one hour each. Fee \$1.00. Text: Expert Shorthand Speed Course. Gregg Writer.

405. Reporters' Course. A continuation of course 404.

Elective; senior year; second semester; 2 credits; 2 lectures; 2 laboratory periods of one hour each. Fee \$1.00. Text: Gregg Reporter.

406. Elementary Civil Service Stenography. Designed for those who wish to take courses 400 and 401 in one semester, in order to prepare rapidly for civil service examination. Course will probably be discontinued after the war. Typing course 415 must be taken concurrently with this course, unless student has had the equivalent.

Elective; all courses; either semester; 6 credits; 7 recitations. Texts: Gregg Shorthand Manual. Gregg Speed Studies. Gregg Writer.

407. Advanced Civil Service Stenography and Typewriting. A continuation of course 406. Equivalent to courses 402 and 403 combined in one semester.

Elective; all courses; either semester; 6 credits; 6 recitations; 8 laboratory periods of one hour each. Fee \$3.00. Texts: Eldridge Dictation Exercises. Gregg Writer. McDaniel, Civil Service Course.

410. Elementary Typewriting. Rational Touch Typing. Theory and practice of touch typing, covering mastery of the alphabet and numerals. Finger gymnastics, rhythm drills, dictation exercises. Punctuation and mechanical arrangement of business correspondence.

Elective; all courses; either semester; 2 credits; 5 laboratory periods of one hour each. Fee \$2.00. Text: Rational Typewriting.

411. Elementary Typewriting. Continuation of course 410. Legal forms, tabulating, centering, manifolding, and speed practice. Special attention given to the mechanics of the typewriter. Speed certificates granted.

Elective; all courses; either semester; 2 credits; 5 laboratory periods of one hour each. Fee \$2.00. Text: Rational Typewriting.

412. Office Training and Management. Designed to give such knowledge and training as is called by employers "experience." Advanced typewriting, dictaphone, stencil and mimeograph work. Topics covered: attractive arrangement of business letters; applying for a position; office routine; inclosures, remittances, and banking; filing systems; office appliances; shipping information; business ethics; printing and proof reading; a day's work coordinated into an organized whole; office efficiency problems.

Prerequisite: Commerce 411, or equivalent; junior year; first semester; 3 credits; 2 lectures; 4 laboratory periods of one hour each. Required of all Stenography and Office Training students. Fee \$2.00.

413. Secretarial Training for Stenographers. Continuation of course 412. Actual service in the College administrative offices required. Topics covered: private secretary defined; learning the position; managing callers; handling correspondence; filing; outlines and reports; sources of information; editing and proof reading; appointments, diaries, and accounts; ethics; systematizing the office.

Junior year; second semester; 3 credits; 3 lectures; 3 laboratory periods of one hour each. Fee \$1.00.

414. Bibliography. Advanced library training for secretaries and others, in order that they may know where and how to find quickly all information regarding any important field of knowledge. Method of indexing books and general filing. Twelve lectures and problems will be given by experts in the various fields, covering the main principles, chief authorities, and the source of material.

Dewey Decimal Classification: 3 lectures and problems by the College Librarian. Subject Headings: 3 lectures and problems by the College Cataloguer. Elective; junior year; second semester; 1 credit; 1 lecture.

415. Elementary Civil Service Typewriting. Rational Touch Typing. Same as courses 410 and 411 combined in one semester. Designed for students taking shorthand course 406, and for those desiring to prepare for civil service examination in typing. Course will probably be discontinued after the war.

Elective; all courses; either semester; 4 credits; 10 laboratory periods of one hour each. Fee \$3.00. Text: Rational Typewriting.

416. Expert Typists' Course. Designed to give expert finger training. Special emphasis on rapid tabulating, billing, and manifold. Speed and endurance drills. Certificates of proficiency and awards for speed and accuracy will be issued.

Prerequisite: Commerce 412. Either semester; 1 credit; 3 laboratory periods of one hour each. Fee \$1.00. Text: Rational Typewriting.

417. Expert Typists' Course. Continuation of course 416. Artistic typewriting based upon the following points: even touch, absolute accuracy, and judicious display. Endurance speed tests.

Prerequisite: Commerce 416. Elective; either semester; 1 credit; 3 laboratory periods of one hour each. Fee \$1.00. Text: Rational Typewriting.

SCHOOL OF ENGINEERING AND MECHANIC ARTS

GRANT ADELBERT COVELL, Dean

The School of Engineering offers courses leading to the advanced professional degrees, the degree of Bachelor of Science, and the vocational certificate in Mechanic Arts.

Advanced Degrees. The professional degree of Civil Engineer, Electrical Engineer, or Mechanical Engineer, is offered to graduates of this College, or other colleges of equal rank, who have attained the degree of Bachelor of Science in the corresponding engineering course, and met the further requirements for graduate study laid down on pages 74-75 of this catalogue. These requirements specify one full year of resident work amounting to 32 college credits, including an acceptable thesis.

Baccalaureate Degrees. Four-years courses leading to the degree of Bachelor of Science are offered in the School of Engineering as follows:

A course in Civil Engineering, with majors in Highway Engineering, Irrigation Engineering, and Structural Engineering.

A course in Electrical Engineering.

A course in Industrial Arts.

A course in Mechanical Engineering.

Vocational Course. A three-years vocational course in Mechanic Arts is also offered. While this course does not lead to a degree, a certificate or diploma will be awarded to those students who complete it.

The Requirement for Graduation in each of the four degree courses offered in the School of Engineering is 136 college credits. These credits are mostly in the form of required subjects in the individual courses, but they may be classified in groups as follows:

GROUP	Civil Eng.	Elec. Eng.	Indus. Arts	Mech. Eng.
Professional Group	80	72	51	66
Pure Mathematics	19	18	3	18
General Science	14	18	12	14
Shop Work		8	16	13
General Subjects, including electives..	13	10	44	15
Military Science	2	2	2	2
Military Drill	6	6	6	6
Gymnasium	2	2	2	2
	136	136	136	136

It is expected that the student will closely follow the outline of the course specified in the department in which he is registered.

CIVIL, HIGHWAY, AND IRRIGATION ENGINEERING

EXECUTIVE COMMITTEE

GORDON VERNON SKELTON, Chairman

Professor of Highway Engineering

THOMAS ANDERSON HENDRICKS TEETER,

Professor of Irrigation Engineering and Hydraulics

CONDE BALCOM McCULLOUGH,

Professor of Civil Engineering

Since the Board of Higher Curricula has restored the degree course in Civil Engineering to the College, it seems best to discontinue the degree of Bachelor of Science in Highway Engineering, and in Irrigation Engineering. Hereafter students who have met all of the requirements for graduation in either of these courses will receive the degree of Bachelor of Science in Civil Engineering also naming the major subject, as B. S. in Civil Engineering, majoring in Highway Engineering, etc. The work of this entire division of Civil Engineering is organized under three department heads, each responsible for the administration of his particular department.

The Executive Committee composed of the three heads of departments, decides matters of general policy, secures coordination, and promotes general efficiency.

Equipment. In addition to joint use with the other engineering departments of the testing laboratories described elsewhere, this division has a suite of well-lighted rooms, suitably arranged on the second floor of Mechanical Hall. This suite includes offices, recitation, and lecture rooms; an instrument room, and draughting and designing rooms, together with a well-equipped blue-print room with a cylindrical electrical blue-print machine, sun frames, and washing pans.

The draughting and designing rooms are well lighted and fully equipped with thoroughly modern and convenient drawing tables, supplied with individual lockers for instruments and other apparatus. The instrument room is conveniently arranged, having an individual glass-front case for each instrument and its accompanying equipment, which includes marking pins, tape, range-poles, notebook, etc. The instrument equipment includes the following: twelve transits, four of which are provided with solar attachment; nine levels, four plane-tables, one compass and two current meters, all high-class instruments of various standard makes and styles; a sufficient supply of level and stadia rods, range-poles, tapes, chains, plain and prismatic compasses, aneroid barometers, clinometers, planimeters, plumb-bobs, hand levels, etc., together with a well-selected assortment of specifications and blue-print plans of engineering structures for illustrative purposes.

CIVIL ENGINEERING

CONDE BALCOM McCULLOUGH, Professor
SAMUEL MICHAEL PATRICK DOLAN, Assistant Professor
DEXTER RALPH SMITH, Instructor

The purpose of the course in Civil Engineering is to give the student thorough theoretical instruction, accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, and Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department. The student has the opportunity, during the senior year, to select his work along lines that he is most interested in.

Recognizing the value of drawing to the professional engineer, not only as a means of expressing his ideas and of carrying out his plans, but also as a means by which the young graduate may enter some of the most desirable positions, the department lays special emphasis upon this subject. Much drawing is also required in connection with the preparation of plans and working drawings, as part of the office work of the higher technical courses.

The work in Surveying begins with the freshman year and continues through the sophomore year, with from six to nine hours of field practice a week. The student serves in subordinate positions at first, and gradually advances as a knowledge of the instruments is acquired. After having served his term as an apprentice, he is placed in charge of field parties and is held responsible for the results accomplished. During the freshman year he is given practice in land surveying and leveling, and during the sophomore year in topographic and railroad surveying. At all times, conscientious attention to duty, accuracy, and speed will be demanded. Every student keeps full and accurate notes of all work done in the field. These, after being criticised, are transcribed and filed with the instructor.

In addition to the specified required work a number of technical lectures will be given to freshmen by members of the engineering faculty. The purpose of these lectures is to acquaint the entering class with the general scope and purpose of the work which they have chosen as a profession.

DEGREE COURSE IN CIVIL, HIGHWAY, AND
IRRIGATION ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Spherical Trigonometry (Math. 15).....	1	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100, 101).....	3	3
Mechanical Drawing (C. E. 107).....	3	
Engineering Drawing (C. E. 111).....		3
Descriptive Geometry (M. E. 152).....	3	
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Plane Surveying (C. E. 222).....		5
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2).....	1	1
	17½	17½

Sophomore Year

Differential Calculus, Integral Calculus (Math. 51, 52)....	4	4
Engineering Physics (Phys. 101, 102).....	4	4
Topographic Surveying (C. E. 223).....	5	
Railroad and Canal Surveying (C. E. 272).....		5
Gymnasium (Phys. Ed 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
Electives (Restricted)	3	3
	17½	17½

	Semester	
	1st	2nd
Junior Year *		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
* Roads and Pavements (H. E. 405).....	3	
Graphic Statics (C. E. 511).....	2	
Hydraulics (I. E. 102).....		3
Cement and Highway Laboratory (Exp. E. 231).....	2	
* Structural Materials Laboratory (Exp. E. 232).....		3
Military Science (Theo. Inst. 1, 2).....	1	1
Masonry and Foundations (C. E. 552).....		3
Drill (Military 5, 6).....	1	1
** Electives (Restricted)	3	3
	17	17

* Irrigation students in the junior year will take Irrigation Farming (Drainage and Irr. 3) instead of Roads and Pavements; and Soil Physics (Soils 5) instead of Structural Materials Laboratory.

** Approved Electives: English, Modern Language, Economics, National Government, State and Municipal Government, Geology, Differential Equations, Least Squares.

Senior Year

Engineering Seminar (C. E. 605, 606).....	1	1
Roofs and Bridges (C. E. 513, 514).....	4	4
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (H. E. 607).....		2
Municipal Water Supply (I. E. 305).....	3	
Sanitary Engineering (I. E. 702).....		3
Engineering Electives	5	6
	16	16

Senior Year

Structural Option

Roofs and Bridges (C. E. 513, 514).....	4	4
Engineering Seminar (C. E. 605, 606).....	1	1
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (C. E. 607).....		2
Advanced Structural Engineering (C. E. 515, 516).....	3	3
Design of Highway Structures (H. E. 415).....	2	
Advanced Materials Laboratory (Exp. E. 235).....		2
Engineering Electives	3	4

The following courses are offered:

107. Mechanical Drawing. The use of instruments and the elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, and finally, the complete development of a working blue print of some simple device from sketches. Particular attention is given to free-hand lettering, general neatness, and accuracy.

Civil, Highway, Irrigation, and Mining Engineering; first semester; 3 credits; 3 laboratory periods. Fee \$0.50. Text: French, Engineering Drawing.

111. Engineering Drawing. A continuation and extension of the previous work in drawing, with special reference to application in Highway and Irrigation Engineering. Practice in tracing and in blue and black line process printing will be given.

Prerequisite: C. E. 107. The course in Civil, Highway, and Irrigation Engineering; freshman year; second semester; 3 credits; 3 laboratory periods. Fee \$0.50. Text: French, Engineering Drawing.

222. Plane Surveying. This course includes recitations, lectures, field and office work in the theory and practice of plane surveying. The theory and construction of the different surveying instruments are studied, and practice will be given in making their tests and adjustments. The United States public land surveys and land laws are studied. Forms of field notes, methods of balancing and plotting surveys, computing areas and like work, will have due consideration. Proper emphasis will be placed upon chain surveying. Surveys will be made of assigned plots, and descriptions prepared. Resurveys will be made where more than ordinary difficulty is encountered in the interpretation of the descriptions and existing evidence.

Prerequisite: Math. 11 and C. E. 107. The courses in Civil, Highway, and Irrigation Engineering, and Landscape Gardening; freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

223. Topographic Surveying. This course will include the execution of a complete topographic survey of an assigned tract, including the base line measurement, transit, stadia, and plane table work, plotting, and finishing the map.

Prerequisites: C. E. 222 and 107. The courses in Civil, Highway, and Irrigation Engineering, and Landscape Gardening; sophomore year; first semester; 5 credits; 1 recitation; 4 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

225. City Surveying. (Elective.) A study of the necessary precision; a survey of a portion of the city; also a new addition, including the preparation of plots, establishment of grades, etc.; survey and office work for preparation of plans for street improvement; preparation of estimates, etc.

Senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

232. Plane Surveying. In this course substantially the same ground will be covered as in course 222, except that there will be but two-thirds as much field practice.

Prerequisites: Math. 11, 21, 31, and Mechanical Drawing. The courses in Mining; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

234. Plane Surveying. An abridgment of course 222 designed to meet the requirements of students in Forestry and Logging Engineering. As much time as possible will be given to the study and use of the type of instruments used in the Forestry service. Some time will be given to the retracing of lines from original descriptions and field notes and to different methods of determining the meridian.

Prerequisites: Math. 11, and Mech. Draw. The courses in Forestry and Logging Engineering; freshman year; second semester; three credits; one recitation; 2 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

235. Topographic Surveying. A condensation of course 223. This course is designed for students in Forestry and Logging Engineering.

Prerequisite: C. E. 232 or 222. The courses in Forestry and Logging Engineering; sophomore year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

242. Farm Surveying and Leveling. This course is designed for Agricultural students, and consists of problems of chaining, elementary transit work, and in leveling. Most emphasis will be put upon leveling and its application to drainage and general irri-

gation work. Problems will be given in profile and contour work as applied to farm drainage, road construction, and irrigation.

Agricultural course; freshman year; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.00. Text: Pence and Ketchum, Surveyor's Manual.

243. Topographic Surveying. This course is designed especially for those taking the Irrigation Farming course, and is an enlargement on C. E. 242. A complete topographic survey and map of an assigned area will be made. Special emphasis will be put on the study of the relation of surface topography to methods of water distribution, drainage, etc., all illustrated by an assigned survey and map. Methods of locating ditches and of making estimates on grading for the same will be studied from the contour map.

Prerequisite: C. E. 242. Irrigation Farming course; junior year; first semester; 2 credits; 2 laboratory periods with assigned lectures where required. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

252. Precise Surveying and Geodesy. A study of the precise methods of surveying and leveling, base line measurements, precise triangulation, determination of true meridian and latitude.

Prerequisite: C. E. 222, 223, 272. Elective; senior year; second semester; 2 credits; 2 recitations; 1 laboratory period. Fee \$1.00.

254. Plane Surveying. A brief course in surveying for those who do not find time to take C. E. 222, 232, or 234. Lectures, field and office practice in the care and use of surveying instruments. Transit and traverse work. Leveling and topography.

The course in Electrical Engineering; junior year; second semester; 2 credits; 2 laboratory periods. Fee \$1.00.

256. Plane Surveying. This course includes recitations, lectures, field and office work in the theory and practice of plane surveying. The theory and construction of the different instruments. Tests and adjustments of instruments. Transit and traverse work. Leveling and topography. Computation of earthwork. Computation of reservoirs, etc..

Elective; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00.

272. Railroad and Canal Surveying. This course will include a study of the simple, compound, transition, and vertical curves, and of earthwork. Students will solve many problems both in the class room and in the field, and will make a survey of a canal, highway, or

railroad, including a reconnoissance, preliminary survey, location survey, and estimates of earthwork. Emphasis will be placed on yardage estimates, cross-sectioning and earthwork computations, and details of construction.

Prerequisites: C. E. 222 and 223. Civil, Highway, and Irrigation Engineering, and Landscape Gardening; sophomore year; second semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$1.00. Text: Allen, Railroad Curves and Earthwork.

274. Railroad Surveying. This course is designed especially for the Logging Engineering course, and takes up the survey of a railroad line through rough wooded country, including a reconnoissance, preliminary, and location surveys of such a line. A complete estimate of the yardage, and also of the cost of the road is made. The course also includes the study of the simple, compound, vertical, and transition curves.

Prerequisites: C. E. 223 or 233. Course in Logging Engineering; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each. Fee \$1.00. Text: Allen, Railroad Curves and Earthwork.

281. Railway Engineering. Study of the methods of railway construction and maintenance, standard structures, trestles, tunnels, culverts, minor bridges, ballast, rails and rail supports and fastenings, yards and terminals. This course will be preceded by a brief review of the simple and compound curve and the railway spiral.

Prerequisite: C. E. 272. Elective; first semester; 3 credits; 2 recitations; 1 laboratory period. Text: Webb, Railway Construction.

282. Railway Engineering. Continuation of course 281.

Elective; second semester; 3 credits; 2 recitations; 1 laboratory period. Text: Webb, Railway Construction.

511. Graphic Statics. A study of graphic analysis as applied to the determination of stresses in cranes, derricks, roof and bridge trusses, and similar problems. A study is also made of the more recent methods of graphical analysis as applied to the evaluation of four dimensional expressions.

The courses in Civil, Highway, and Irrigation Engineering; first semester; 2 credits; one recitation and one three-hours laboratory period. Fee \$0.50.

513. Roofs and Bridges. A study of stress analysis and design as applied to simply supported structures, including the prepara-

tion of stress diagrams, general detail drawings, shop drawings, and material bills. Trusses of the Pratt, Howe, Warren, and similar types, curved chord and subpaneled trusses, plate girder, and beam spans will be treated in this course.

Prerequisites: M. E. 251, 252. Senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each. Fee \$1.00. Text: Kirkham, Structural Engineering.

514. Roofs and Bridges. A continuation of course 513. Advanced work in highway bridge design including a treatment of "higher bridge structures." Draw spans, continuous girder and truss spans, cantilever, suspension, and arch spans of the various types are treated in this course.

Senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Johnson, Bryan, and Turneure, Modern Framed Structures, Part II.

515. Structural Engineering. Advanced draughting room work including the preparation of detail drawings, shop drawings, material bills, etc. Preparation of itemized estimates and analysis of cost will be treated in this connection. Plans and working drawings will be prepared for roof trusses, girder spans, pin-connected and riveted bridge trusses and similar construction.

Senior year; first semester; 3 credits; 3 laboratory periods. Fee \$1.00.

516. Structural Engineering. Continuation of course 515. Draughting room and class room treatment of advanced work in structural design, including a study of the theories of internal work, secondary stress calculation and allied problems, together with a discussion of the more recently developed methods for the solution of indeterminate structures.

Senior year; second semester; 3 credits; 3 laboratory periods. Fee \$1.00.

552. Masonry and Foundations. A study of the properties of stone, brick, lime, cement, mortars, and concretes, and methods of their adaptation for use in foundations, retaining walls, piers, dams, and similar construction. Recitations, lectures, and work in the draughting and computing room.

The courses in Civil, Highway, and Irrigation Engineering; junior year; second semester; 3 credits; 3 recitations.

557. Reinforced Concrete. A study of the fundamental principles of reinforced concrete design as applied to beams, girders, columns, walls, and arches. Designs for the beam, girder, and arch

types in bridge construction; also typical retaining wall and irrigation structures are worked out in the draughting room and detailed drawings made of the same. This course also includes the investigation of the elastic arch together with a study of the use of influence diagrams in arch analysis.

The courses in Civil, Highway, and Irrigation Engineering; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Text: Turneaure and Maurer, Principles of Reinforced Concrete.

605. Engineering Seminar. The members of the senior class in the courses of Civil, Highway, and Irrigation Engineering, and the professors and instructors, constitute the Engineering Seminar, which meets once a week. The purpose of this seminar is to bring the student in touch with engineering literature and practice. To this end, a number of journal reviews and papers on engineering subjects will be presented and freely criticised each week. The work will follow a previously arranged program.

Senior year; first semester; 1 credit.

606. Engineering Seminar. See course 605.

Senior year; second semester; 1 credit.

621. Military Surveying and Mapping. This course is designed to give elementary instruction in the art of making military maps, surveys, and reconnaissance. The work consists of a series of lectures, amplified by work in the field. Instruction is given in the use of the military sketching case and clinometer, in the construction of topographical maps, road sketches, free-hand perspective, etc.

Offered both first and second semester to all students registering for special military work. One credit; 2 hours laboratory and field work each week as arranged. Fee \$1.00.

622. Military Structures. A study of the methods used in the construction of the simpler military structures, including revetments, brush work, obstacles, and the simpler military bridges. The course includes instruction in knot tying, rope lashings, and in the handling of heavy weights by means of shear poles, derricks, etc.; the construction of military obstacles and the weaving of brush work revetments are also included. A series of lectures amplified by actual work in the field.

Offered both first and second semesters to all students registering for special military work. One credit; 2 hours laboratory and field work each week as arranged. Fee \$1.00. Text: Engineer Field Manual, Leach.

HIGHWAY ENGINEERING

GORDON VERNON SKELTON, Professor

There are few lines of public endeavor where more money is being spent, or where a higher degree of technical skill and training is required, than in the field of highway engineering. The purpose of this course is to meet the demand in this State and throughout the Northwest for men equipped to take charge of road and city street construction and maintenance work. Aside from the opportunity for useful and honorable service, no field, it is believed, offers greater encouragement in a financial way to the young man of ambition and ability.

Thorough theoretical instruction is accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, Drawing, Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department.

The department of Experimental Engineering is equipped with complete and thoroughly up-to-date testing laboratories, including the very latest and best cement- and highway-testing machinery, thus affording students in Highway Engineering the opportunity of studying by direct observation and experiment the strength and properties of the various engineering materials.

In the study of highways, special reference is made to the conditions and needs of Oregon. Due consideration is given to the construction and maintenance of dirt, gravel, and broken-stone roads as well as to the higher types. In consequence of the vast area of the State, this class of roads must, of necessity, constitute the greater part of its highways for many years.

DEGREE COURSE IN HIGHWAY ENGINEERING

The prescribed courses of the freshman, sophomore, and junior years in Highway, Civil, and Irrigation Engineering are identical.

	Senior Year	Semester	
		1st	2nd
Roofs and Bridges (C. E. 513, 514).....		4	4
Engineering Seminar (C. E. 605, 606).....		1	1
Reinforced Concrete (C. E. 557).....		3	
Contracts and Specifications (H. E. 607).....			2
Highway Engineering (H. E. 407, 408).....		4	4
Economics of Highway Construction (H. E. 410).....			2
Advanced Highway Laboratory (Exp. E. 233).....		2	
Engineering Electives		2	3
		—	—
		16	16

The following courses are offered:

405. Roads and Pavements. A study of the fundamental principles of location, construction, and maintenance of roads, as well as a thorough study of the materials used in road and street building. Asphalt, brick, wood block, stone, concrete, and other forms of street pavements are carefully studied. This course is given in connection with a laboratory course, Exp. E. 131.

The courses in Civil, Highway, and Irrigation Engineering, and Landscape Gardening; junior year; first semester; 3 credits; 3 recitations.

407. Highway Engineering. Economic grades and proper location for different soils and surfacing materials. Surface and sub-surface drainage. Culvert design and construction. Construction and maintenance of earth, sand-clay, gravel, macadam, concrete, brick, and other types of roads. Dust preventives and road binders. Preliminary surveys and estimates. Specifications.

Senior year; first semester; 4 credits; 3 lectures; 1 laboratory period.

408. Highway Engineering. Continuation of course 407.

Senior year; second semester; 4 credits; 2 lectures; 2 laboratory periods.

410. Economics of Highway Construction. Economic and social advantages of improved roads. The traffic census. Local and centralized systems of control. Highway laws of different states. Organization of construction and engineering forces. Cost

data. Methods of handling work. Forms of contract — lump sum, unit price, percentage and cost plus fixed sum.

Senior year; second semester; 2 credits; 2 recitations.

415. Design of Highway Structures. A draughting room course in the design of the various structures required in highway work. The various culvert types, short-span beam bridges, tunnels, retaining walls and similar construction, including a consideration of methods for preliminary waterway engineering, selection of type, and allied questions.

Elective; senior year; 2 credits; 2 laboratory periods. Fee \$1.00.

607. Contracts and Specifications. A study of the general principles and laws of contracts as applied to engineering, including the preparation and study of specifications and contracts based upon engineering structures designed by the individual student.

Senior year; second semester; 2 credits; 2 recitations.

GRADUATE COURSE IN HIGHWAY ENGINEERING

From Thursday, January 2, 1919, to end of first semester.

This short course in Highway Engineering is given by the department of Highway Engineering in cooperation with the departments of Civil, Experimental, and Irrigation Engineering and is intended for graduate engineers who wish to specialize in some line of highway work, or for others properly prepared. The purpose of the course is to review the principles and current practice of Highway Engineering.

The various courses are complete in themselves and any one course may be taken without the others if the applicant's preparation is suitable for that course.

Instruction will be given by means of lectures, assigned reading, and laboratory practice. Special lectures by non-resident engineers will be provided where possible. No classes will be formed unless a sufficient number of students apply. During the year 1918 classes will not be arranged for more than 16 credit hours a week.

Those intending to take the course should write Professor Skelton in advance.

The following courses are offered:

Road Design. Two times a week.

Construction of Roads. Three times a week.

Highway Bridges. Three times a week.

Cement and Highway Laboratory. Three laboratory periods a week.

Street Design and Construction. Three times a week.

Reinforced Concrete Highway Structures. Three times a week.

Contracts and Specifications. Two times a week.

The Hydraulics of Highway Drainage and Construction. One laboratory period a week.

IRRIGATION ENGINEERING

THOMAS ANDERSON HENDRICKS TEETER, Professor

Successful agriculture in the arid parts of Oregon is based on the science of irrigation. The widespread development of irrigation lands in this and other states of the arid west, by means of both gravity supplies and pumping systems, has extended the necessary qualifications of the engineer to include a knowledge of irrigation methods, pumping, and power machinery. The province of the engineer, therefore, comprises the development, conservation, and economical use of limited water supplies. The failure of our irrigation projects is too frequently caused by the employment of incompetent engineers and managers. In recognition of the need, in the Pacific Northwest, for engineers trained in hydraulics, irrigation, and water power, the course in Irrigation Engineering has been established.

Realizing, however, that the young engineer is frequently obliged to take charge of work which properly falls outside of the field in which he has specialized, the course in Hydraulics and Irrigation Engineering is arranged to cover as broad a field as practicable, in order that the graduate may experience little difficulty in accommodating himself to the available positions. The curriculum in the freshman and sophomore years is the same as in the general civil engineering courses. It has for its purpose the laying of a foundation on which to build the more specialized technical work of the junior and senior years. The last two years are intended to equip the student with a well-rounded knowledge of hydraulics and irrigation engineering — a knowledge which will enable the student to hold a responsible position in reclamation and power work.

The work of this department is designed to furnish a thorough course of theoretical instruction accompanied by practice in the various lines of irrigation, drainage, water-supply, and water-power engineering. The course, moreover, is made practical by a large proportion of laboratory and field practice in conjunction with the theoretical work. Special stress is laid on the solution of problems, and experiments in the laboratory. Emphasis is laid on skill in handling surveying and water-measuring instruments. The student is taught how to make stream measurements; design, lay out, and construct dams, canals, headworks, diversion weirs, flumes, pipe lines, and distributing systems.

Inspection trips are conducted in the junior and senior years to afford the students an opportunity to familiarize themselves with actual engineering work.

Electives. Ample opportunity is given the student to elect courses outside of the School of Engineering. This provision is made that the student may be encouraged to study Business Management, Economics, Political Science, Accounting, English, and Modern Languages, a knowledge of each of which is helpful, if not essential, in the engineering profession. In addition, the School of Agriculture offers to the student of irrigation engineering, special courses in irrigation farming, forage crops, climatology, farm drainage, and soil physics together with their relations to the growth of crops on irrigated lands.

Equipment. The excellent equipment of the Civil and Experimental departments, as described under these respective titles, is available for use by the students in Irrigation Engineering. Besides the draughting rooms and laboratories, the student has the use of transits, levels, plane-tables, current meters, and tapes, for practical work, as well as pumps, water meters, rams, and small water wheels of the Experimental Engineering laboratories for experimental work. Facilities for experiments with small weirs, orifices, and devices for measuring irrigation water are provided.

In addition to the above facilities, the proximity of the Willamette and Mary's rivers, Oak Creek, and the mill race of the Corvallis Flouring Mills, affords excellent opportunities for practice in stream gauging. For those students who desire to prepare themselves for positions as managers of irrigation projects, the courses in Drainage and Irrigation give access to the equipment of that department.

COURSE IN IRRIGATION ENGINEERING

The prescribed courses of the freshman and sophomore years of the courses in Irrigation, Civil, and Highway Engineering are identical.

Senior Year	Semester	
	1st	2nd
Engineering Seminar (C. E. 605, 606).....	1	1
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (H. E. 607).....		2
Roofs and Bridges (C. E. 513).....	4	
Drainage Engineering (I. E. 502).....		3
Hydrology (I. E. 303).....	1	
Soil Surveying (Soils 13).....		3
Irrigation Engineering (I. E. 401).....	2	
Design of Irrigation Structures (I. E. 402).....		2
Hydraulics Laboratory (Exp. E. 262).....		2
Hydraulic Pumps and Motors (I. E. 201).....	2	
Electives (Approved)	3	3
	—	—
	16	16

The following courses are offered:

101. Hydraulics. A practical application of the principles of hydraulics to irrigation farming, arranged especially for agricultural students. A study of the laws of water pressure in tanks, pipes, and flumes; the measurement of water by weirs, orifices, and current meters; the study of losses of head in pipes and the consequent effect on the discharge. The design of open channels; seepage losses; the operation of rams, pumps, and other lifting devices.

Elective for seniors in Agriculture; senior year; first semester; 2 credits; 2 lectures. This course can be taken only in conjunction with Experimental Engineering 265, a 1-credit laboratory course, covering the same field. Text: Merriman, Elements of Hydraulics.

102. Hydraulics. A technical course dealing with the elementary laws of liquids in motion and at rest; the weight and pressure of water on dams and gates, velocity and discharge through orifices, tubes, pipes, and flumes; stream-lines, fluid friction, losses of head; time of emptying reservoirs; and waterhammer.

Prerequisite: M. E. 251. Required of juniors in Civil, Highway, Irrigation, Electrical, and Mining Engineering; junior year; second semester; 3 credits; 3 lecture periods. Text: Daugherty, Elements of Hydraulics.

103. Hydraulics. A course similar in character to 102, dealing with the elements of hydraulics as applied to mechanical engineering. Students who have not completed Statics and Dynamics must register for M. E. 251 simultaneously with this course.

Prerequisites: Math. 52. Required of juniors in Mechanical Engineering; junior year; first semester; 2 credits; 2 recitations a week. Text: Daugherty, Elements of Hydraulics.

201. Hydraulic Pumps and Motors. The application of the principles of hydraulics to the design, construction, and operation of pumps and water wheels; the various forms of wheels and pumps, their adaptability, and efficiency.

Prerequisite: Hydraulics, I. E. 102. Required of seniors in Irrigation Engineering; elective for all other seniors in Engineering; senior year; first semester; 2 credits; 2 lecture periods. Texts: Daugherty, Hydraulic Turbines. Daugherty, Centrifugal Pumps.

203. Hydraulic Pumps and Motors. A study of the design, construction, and operating characteristics, and cost of hydraulic power and pumping machinery, together with the proper use and selection thereof.

Prerequisite: Hydraulics, I. E. 102 or 103. Elective for students in engineering courses who have completed Elementary Hydraulics; first semester; 3 credits; 3 lecture periods. Texts: Daugherty, Hydraulic Turbines. Daugherty, Centrifugal Pumps.

204. Water Power. A general study of the development of water power on streams; the effect of pondage, storage, and load factor on the capacity and efficiency of the plant and equipment; a detailed study of the characteristics of modern water turbines, together with an investigation of the speed regulation and manner of governing large plants. Practical problems in the design of plants will constitute a part of this course.

Prerequisite: Water Supply Engineering, I. E. 305 or Irrigation Engineering, I. E. 401. Elective for seniors or graduates in Engineering courses; senior year; second semester; 3 credits; 3 lecture periods. Fee \$1.00. Text: Meade, Water Power Engineering.

303. Hydrology. A recitation and problem course dealing with the character of drainage basins; relations between rainfall and runoff; estimating flow from watersheds; variations in seasonal discharges, a study of current meters, and other instruments and methods for determining stream flow; the hydrograph and its

use; the duration curve; the ripple curves and their relations to power and storage studies.

Prerequisite: I. E. 101 or 103. Required of seniors in Irrigation Engineering; elective for other Engineering students and Agricultural students; senior year; first semester; 1 credit; 1 recitation. Text: Hoyt and Grover, River Discharge. Fee \$1.00.

305. Municipal Water Supply. Preliminary investigations for determining the available supply of water for irrigation and domestic purposes; the use of the mass diagram in the study of storage; ground water resources; the source of water supplies; manner of conveying and storing water; requirements for fire protection; the economics of pumping and the proper installation of pumping plants. The solution of numerical problems is required of the student.

Prerequisites C. E. 511, I. E. 102. Elective for seniors in Engineering; senior year; first semester; 3 credits; 2 lecture periods; 1 laboratory period. Fee \$1.00. Text: Turneure and Russell, Water Supply Engineering.

401. Irrigation Engineering. Investigations and surveys; the operation and maintenance of large irrigation projects from the engineer's point of view; precipitation, run-off, underground flow, fluctuation of stream flow; storage; methods of determining losses due to evaporation and seepage; canal linings; the phenomena of water logging and alkali deposits; drainage; the duty of water; irrigation by pumps; the location and construction of irrigation systems; diversion weirs, headgates, flumes and drops; the theory and practice of water measurements, water records, methods practiced in other countries.

Prerequisite: I. E. 102. Required of seniors in Irrigation Engineering; senior year; first semester; 2 credits; 2 lecture periods. Text: Etcheverry, Conveyance of Water, Vol. II.

402. Irrigation Construction. This course deals with the storage and conveyance of water; the design of headworks and flumes; the selection of dam sites; investigations of the stability of dams in use; the design of a dam by Wegman's method; the design of pipe lines, earthen dams, and reservoirs; the design of flash boards and movable dams, hollow dams, and their application to storage and pondage. This course consists entirely of numerical problems with occasional lectures on the solution of the same.

Prerequisites: C. E. 511, I. E. 401, and I. E. 102. Required of seniors in Irrigation Engineering; senior year; second semester;

2 credits; 2 three-hour laboratory periods. Fee \$1.00. Text: Etcheverry, Irrigation Structures, Vol. III.

502. Drainage Engineering. Surveys for, and design of, large drainage systems; the study of run-off and drainage coefficients; open ditch construction, dredging, and cleaning of large drainage channels; methods of computing sizes of tile drains; plans, reports, and records; estimates of costs; preparation and enforcement of specifications; division of costs; inspection of drain tile.

Prerequisite: I. E. 102. Required of seniors in Irrigation Engineering; senior year; second semester; 3 credits; 2 lectures and 1 laboratory period. Fee \$1.00. Text: Parsons, Drainage Engineering.

602. Water Law. A study of riparian rights; the early development of the water laws of the arid regions; doctrine of appropriation; beneficial use; comparison of California and Colorado doctrines; rights of appropriations; law of storage and diversion; rights of way; relation of water law and land law; relation of water to land appurtenant; prescription; abandonment; federal water laws; state control; water laws of Oregon; adjudication; irrigation and drainage district law; duties of state engineer; a brief comparison of Canadian and foreign water laws.

Elective for seniors in Irrigation Engineering. Text: Davis, The Law of Irrigation.

702. Sanitary Engineering. Drainage systems of populous districts, including chemical and bacterial purification of sewerage; collection and disposal of garbage; street cleaning; separate and combined water carriage systems; surveys, plans, and specifications; law of flow and determination of size and capacity; brick, terracotta, cement, and concrete sewers.

Elective for seniors in Civil Engineering. Prerequisite: I. E. 102. Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Text: Merriman, Elements of Sanitary Engineering.

802. Hydrography and Navigation. This consists of a brief study of the figure of the earth and the celestial sphere, followed by methods of determining latitude, longitude, time, and azimuth from the sun and stars; the location of soundings, maritime charting and mapping; and the fundamentals of navigation. Numerical problems are assigned to supplement the field work.

Prerequisites: C. E. 222, 223, and Spherical Trigonometry. Elective for juniors and seniors; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00.

ELECTRICAL ENGINEERING

RICHARD HAROLD DEARBORN, Professor
LAWRENCE FISHER WOOSTER, Assistant Professor
* WILLIS DHU AINE PEASLEE, Instructor
JOHN HOOPER, Instructor

Since the advent of steam as a motive power, it is probable that no agency has so deeply affected the course of history and the intimate life of a large proportion of the human race as has the electric current, whether used in the transmission of intelligence, to furnish light, or to provide power for transportation and the industries.

Already the electrical industries are counted among the greatest in the world; their employees number more than a hundred thousand in the United States alone; their business in this country doubles every five years; and their field is ever expanding.

Notwithstanding this fact, most of the business is controlled by comparatively few corporations. The competition for desirable positions is therefore keen; and since the field in Electrical Engineering for the independent engineer is limited, only men of exceptional ability and energy attain the higher and more desirable positions.

Accordingly, no man is advised to take Electrical Engineering who does not consider himself, by taste and ability, exceptionally fitted therefor.

The College course is designed especially to train the young engineer in the theory of his profession, such practical work as is given in shop and laboratory being subordinated to this end. Practical acquaintance with actual conditions can be acquired only in the field, during vacation and after graduation. For this reason, and in order to supplement his college education, the student is urged to spend at least a part of his vacation in some line of electrical industry.

Starting with the foundation subjects of mathematics, science, drawing and shopwork, the student proceeds through the study of form expression in descriptive geometry, mechanism, the laws of mechanics, strength of materials, stress in structures and machinery; through the study of electricity and its application to machinery; the characteristic performance of electrical apparatus, its design and operation; through the study of thermodynamics as

* On leave of absence for war service.

applied to various types of heat engines, and finally to the complete power system involving the steam or hydro-electric power plant and the systems for transmitting and distributing electrical energy.

Equipment. The laboratory of this department occupies a large part of the west half of the first floor of Mechanical Hall, and is divided into several rooms, one for high-voltage testing, one for instruments, and another for supplies. Besides the equipment therein, including generators, motors, and other apparatus, the machinery in the College power plant and sub-station, is available for study and testing purposes. Three-phase electrical energy is supplied by the long-distance transmission line or by the local generating unit as desired.

In the laboratory is a $6\frac{1}{2} \times 15$ foot switchboard, consisting of three asbestos wood panels on which are mounted a number of voltmeters and ammeters for direct and alternating current; a power factor meter; a frequency meter, and synchroscope; a set of synchronizing lamps; circuit breakers; switches; and a large number of plug terminals, the leads of which extend to the four machine platforms; two slate panels with instruments and switches for direct-current machines; and two arc light regulating panels. Immediately adjacent thereto is a controller, auto-transformer and rheostat rack, six feet high by sixteen feet in length.

The machine platforms just mentioned are four feet wide by fourteen feet long, and have upon them the following equipment: one five, one seven-and-a-half, one ten, and one fifteen horsepower, three-phase, induction motor; two five, two seven-and-one-half, two ten, and two twelve-and-one-half kilowatt, 125-volt direct-current generators; two seven-and-one-half kilowatt rotary converters for parallel operation and one two-kilowatt rotary converter, two two-and-one-half kilowatt induction motor generator sets; one two-and-one-half kilowatt synchronous motor generator set; three seven and one-half kilowatt revolving field alternators with three additional rotors for parallel operation, and one seven-and-one-half kilowatt revolving field alternator, from all of which current of one-, two-, three-, four-, and six-phases may be taken; two five-arc light constant current, one ten-volt 1000-ampere welding, one five-kilowatt 15,000 volt wireless, three seven-and-one-half kilowatt, 2200-220-110-volt transformers with ten taps each in the secondary, giving nine different voltages from 24 to 220 volts, with 87 percent taps in both primary and secondary for transformation from three-

to two-phase or the reverse, three 110 to 440 volt, and a number of ordinary transformers and compensators.

In addition to these the department is particularly well equipped to handle high-voltage testing with one ten-kilowatt 110,000-volt transformer, and one 100-kilowatt 350,000-volt Thor-darsen transformer.

The instruments available comprise standard portable volt, ampere, and watt meters which are divided into two groups, one of which is used for routine laboratory work, the other reserved for thesis and other tests in which greater accuracy is desired. In addition to this equipment, the departments of Physics and Electrical Engineering maintain an instrument standardization laboratory equipped with two one-hundred ampere storage cells and a group of dry cells to furnish potentials up to one hundred and fifty volts. The precision instruments and apparatus consist of a Leeds and Northrup potentiometer with certified standard cells and a complete line of standard shunts from one one-thousandth to ten ohms, a Weston laboratory standard voltmeter with ranges of 1, 100, and 200 volts and Siemens and Halske laboratory standard ammeters with ranges from 2.5 to 50 amperes and a similar watt-meter with five and ten ampere range.

DEGREE COURSE IN ELECTRICAL ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Elementary Analysis (Math. 31).....		5
General Physics (Phys. 1, 2).....	3	3
Mechanical Drawing (M. E. 151).....	2	
Descriptive Drawing (M. E. 152).....		3
Foundry (Ind. Arts 173).....		2
Patternmaking (Ind. Arts 131).....	2	
Library Practice (Libr. 1).....	1½	
Hygiene (Phys. Ed. 19).....	1½	
Modern English Prose (Eng. 81, 82) or Adv. German or Adv. French (Mod. Lang. 207, 208, or 107, 108)*....	3	3
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	1½	1½
	<hr/> 17½	<hr/> 17½

* By special permission a student may elect beginning German or French, (Modern Language 201, 202, or 101, 102).

	Semester	
	1st	2nd
Sophomore Year		
Differential and Integral Calculus (Math. 51, 52).....	4	4
Electrical Physics (Physics 105).....	3	
Electrical Measurements (Phys 106).....		3
General Chemistry (Chem. 100, 101).....	3	3
Introduction to Electrical Engineering (E. E. 121, 122)....	1	1
Mechanical Drawing (M. E. 153).....	3	
Mechanism (M. E. 204).....		3
Blacksmithing (Ind. Arts 151).....	2	
Machine Shop (Ind. Arts 206).....		2
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Junior Year

Electrical Engineering (E. E. 101, 102).....	4	4
Electrical Engineering Laboratory (E. E. 201, 202).....	3	3
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Heat Engines and Boilers (M. E. 318).....	3	
Hydraulics (I. E. 102).....		3
Plane Surveying (C. E. 254).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/>	<hr/>
	17	17

Senior Year

Electrical Engineering (E. E. 103, 104).....	4	3
Electrical Design (E. E. 105).....		1
Electrical Laboratory (E. E. 203).....	4	
Electric Railways (E. E. 309).....	2	
Illuminating Engineering (E. E. 316).....		2
Telephony and Telegraphy (E. E. 313).....		2
Radio Communication (E. E. 314).....		2
Applied Mechanics Laboratory (Exp. E. 205).....	3	
Power and Hydraulic Laboratory (Exp. E. 206).....		3
Optional	3	3
	<hr/>	<hr/>
	16	16

Suggested Options	Semester	
	1st	2nd
Power Plant Design (M. E. 323).....		3
Concrete Laboratory (Exp. E. 241).....	2	
Public Service Regulation (E. E. 317).....	2	
Periodical Literature (E. E. 301).....	1	
Practical Public Speaking (Eng. 105).....	3	
Technical English (Eng. 141).....	2	
Central Stations (E. E. 318).....		2
Electrical Laboratory (E. E. 204).....		3
Electric Railways (E. E. 310).....		3
High Voltage Engineering (E. E. 308).....		2
Thesis (E. E. 306).....		2
Seminar (E. E. 302).....		1

The following courses are offered:

101. Electrical Engineering. Study of the sine wave and periodic alternating quantity; harmonic analysis; laws governing the flow of current and energy; the magnetic and electrostatic circuit, production of rotating field by means of polyphase alternating currents in a distributed winding; losses in electric circuits; elementary theory of transmission lines.

Course 101 must be taken concurrently with 201, and 102 concurrently with 202. Electrical Engineering; junior year; first semester; 4 credits; 4 recitations. Text: Wilson, Electrical Engineering.

102. Electrical Engineering. Continuation of course 101.

Electrical Engineering; junior year; second semester; 4 credits; 4 recitations. Text: Wilson, Electrical Engineering.

103. Electrical Engineering. A study of the equipment of power plants, transmission lines, and distributing systems, and of the technical and economic problems connected with the generation, transmission, and distribution of electrical energy.

In connection with this course, inspection trips are made to the properties of various power companies. The expense of these trips will approximate twenty dollars, and should be anticipated by every Electrical Engineering student in his senior year.

Prerequisites: E. E. 101, 102, 201, 202. Electrical Engineering; senior year; first semester; 4 credits; 4 lectures.

104. Electrical Engineering. A continuation of course 103. Electrical Engineering; senior year; second semester; 3 credits; 3 lectures.

105. Electrical Design. The design of transmission lines and distribution systems, both overhead and underground, with particular attention to costs.

Electrical Engineering; senior year; second semester; 1 credit; 1 lecture.

121. Introduction to Electrical Engineering. A general survey of the field of electrical engineering and the applications of electricity.

Electrical Engineering; sophomore year; first semester; 1 credit; 1 recitation. Text: Norris, An introduction to the Study of Electrical Engineering.

122. Introduction to Electrical Engineering. A continuation of course 121.

Electrical Engineering; sophomore year; second semester; 1 credit; 1 recitation. Text: Norris, An introduction to the Study of Electrical Engineering.

201. Electrical Engineering Laboratory. Study of electrical instruments; wave form and polarity of alternating currents; current, electromotive force and power relations in circuits involving resistance, inductance, and capacity; principles of operation of direct current dynamos and motors.

Must be taken concurrently with course 101.

Electrical Engineering; junior year; first semester; 3 credits; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Karapetoff, Experimental Electrical Engineering.

202. Electrical Engineering Laboratory. Continuation of course 201. Study of hysteresis and eddy current losses in magnetic circuits, electromotive force and energy losses in electrical circuits; the separation of losses in direct current machinery; efficiency and loading tests of direct and alternating current machinery; properties of insulating materials.

Must be taken concurrently with course 102.

Electrical Engineering; junior year; second semester; 3 credits; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Karapetoff, Experimental Electrical Engineering.

203. Electrical Engineering Laboratory. Characteristic performance of alternating current machinery, including alternator,

synchronous and induction motor, synchronous converter and static transformer with parallel operation and pump back tests.

Prerequisites: E. E. 101, 102, 201, 202. **Electrical Engineering;** senior year; first semester; 4 credits; 1 lecture; 1 laboratory period. **Fee** \$2.50. **Deposit** \$3.00. **Text:** Karapetoff, *Experimental Electrical Engineering*.

204. Electrical Engineering Laboratory. Complete engineering and commercial tests on standard electrical machinery, including standard acceptance tests on machines and plants, and special tests for engineering information. Tests will be run on outside plants under commercial operating conditions.

Prerequisite: E. E. 203. **Electrical Engineering;** senior year; second semester; 3 credits; 1 laboratory period. **Fee** \$2.50. **Deposit** \$3.00.

301. Study of Current Periodical Literature. Presentation of abstracts and discussion of current articles in electrical periodicals.

Electrical Engineering; senior year; first semester; 1 credit; 1 recitation. **Text:** *Current Periodicals*.

302. Seminar. A continuation of course 301 with a more complete analysis and discussion of recent developments.

Electrical Engineering; senior year; second semester; 1 credit; 1 recitation. **Text:** *Current Periodicals*.

306. Thesis. Elective, by permission, to seniors in Electrical Engineering. Only those whose past record indicates ability successfully to complete a satisfactory thesis, will be permitted to make this election.

Electrical Engineering; senior year; second semester; 2 credits.

308. High Voltage Engineering. A study and experimental investigation of high voltage and high frequency phenomena.

Electrical Engineering; senior year; second semester; 2 credits; 2 recitations. **Text:** Peck, *Dielectric Phenomena in High Voltage Engineering*.

309. Electric Railways. A general study of the application of electricity to street and interurban railways, covering traffic conditions, speed time curves, and rolling stock.

Electrical Engineering; senior year; first semester; 2 credits; 2 recitations. **Text:** Harding, *Electric Railway Engineering*.

310. Electric Railways. Continuation of courses 309. A study of conditions governing the electrification of trunk lines; systems of electrification and transportation economics.

Prerequisite: E. E. 309. Electrical Engineering; senior year; second semester; 3 credits; 3 recitations. Text: Electric Traction for Railway Trains.

313. Telephony and Telegraphy. A general study of the application of electricity to the transmission of intelligence. Manual and automatic telephony, duplex and quadruplex telegraphy, submarine and wireless telegraphy.

Prerequisite: E. E. 102. Electrical Engineering; senior year; second semester; 2 credits; 2 recitations.

314. Radio Communication. A study of the theory and methods of radio communication, with special reference to the U. S. Signal Corps Service.

Prerequisite: E. E. 101. Electrical Engineering; senior year; second semester; 2 credits; 2 recitations.

316. Illuminating Engineering. A study of artificial light sources and the application of these sources to illumination, both exterior and interior.

Electrical Engineering; senior year; second semester; 2 credits; 2 recitations. Text: Wickenden, Illumination and Photometry.

317. Public Service Regulation. A study of regulation by commissions, service rules, appraisals, depreciation, and rate making.

Electrical Engineering; senior year; first semester; 2 credits; 2 recitations. Text: Hayes, Public Utilities.

318. Central Stations. A study of the problems arising in the operation of electric systems. Organization, operating problems, public policy, cost accounting, rate study, etc.

Electrical Engineering; senior year; second semester; 2 credits; 2 recitations.

403. Study of Electric Machinery. Class room and laboratory study of electrical instruments, current, electromotive force and power relations; the operation, care, and management of familiar types of generators and motors, both alternating and direct current, and transformers.

Prerequisites: Elementary Chemistry, Physics, Calculus, Mechanics. Mechanical, Mining, and Logging Engineering; junior or senior year; either semester; 3 credits; 1 recitation; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Gray, Principles and Practice of Electrical Engineering.

406. Electric Lumbering Machinery. A special study of the application of electricity to the lumbering and logging industry.

Prerequisite: E. E. 403. Logging Engineering; senior year; second semester; 2 credits; 2 recitations.

408. Electric Mining Machinery. A study of the use of electricity in mines and mining operations.

Prerequisite: E. E. 403. Mining Engineering; senior year; second semester; 2 credits; 2 recitations.

410. Electric Machine Drive. The characteristics of electric motors and their applications to machine shop tools and allied industries.

Prerequisite: E. E. 403. Mechanical Engineering; senior year; second semester; 2 credits; 2 recitations.

EXPERIMENTAL ENGINEERING

SAMUEL HERMAN GRAF, Professor
CHARLES EDWIN THOMAS, Assistant Professor
_____, Instructor
_____, Assistant

The courses in engineering laboratory practice are designed to familiarize the student with processes of investigation; to afford experience in conducting and reporting experimental engineering work; to secure data which shall verify and supplement theoretical instruction; and, to some extent at least, to give a practical knowledge of construction and management of machinery and apparatus.

Appropriate divisions of this work are regularly taken by students in all branches of Engineering, Forestry, and Industrial Arts, and may be elected by students in other courses. Special courses are offered, as listed in what follows, to meet the needs of the students in the different lines of work. An earnest effort is made, not so much to impart a mass of detail, as to develop in the student his powers of observation and his capacity for independent thought.

Reports are required of all experiments, and are regarded as a most important part of the work. They are carefully read and criticised as to form, neatness, conciseness, accuracy of expression and spelling, as well as accuracy of technical data and calculations. With this training, when the student completes the work, he should know how to prepare an acceptable engineering report, or how to arrange data for publication.

Equipment. Appropriate portions of the equipment for this work are utilized by all departments in Engineering and Forestry. The equipment comprises the following divisions: a materials-testing laboratory, a cement-testing laboratory, a steam laboratory, and a gas-engine and hydraulic laboratory. These divisions have in common the equipment for the preliminary work, such as calculating devices, planimeters, Amsler integrator, micrometers, and other general apparatus.

The materials-testing laboratory occupies the northwest corner of the first floor of Mechanical Hall and contains the following: a 150,000-pound Riehle universal testing machine fitted with extension table for beams up to 16 feet in length; a 50,000-pound Riehle automatic and autographic testing machine; a 60,000-pound-inch Olsen torsion-testing machine; a 400-foot-pound drop-testing ma-

chine and a static load-testing machine, both of which were built in the College shops; a Landgraf-Turner alternating impact testing machine; a Case tempering furnace with pyrometer; Scleroscope and Brinell ball hardness testers; Tassin metallographic outfit; Bausch and Lomb inverted metalloscope; Leods and Northrop transformation range apparatus; grinding and polishing equipment; and auxiliary apparatus including a deformeter, torsion indicator, compression micrometers, several extensometers, deflectometers, and other minor pieces.

A part of the materials laboratory also is devoted to the testing of materials for highway construction. This equipment includes the following: Olsen impact machine for toughness tests; Riehle machine for hardness tests; ball mill, molding machine, and impact machine for cementing value tests on rock dust; rattler for abrasion tests on macadam or paving-rock, another for paving-brick; core drills and saw for cutting stone specimens; shakers and sieves for mechanical analysis of sand and aggregates, including a set of Tyler standard screen scale sieves; penetrometer, viscosimeter, float test, Osborne adhesive machine, centrifuges, and other appliances for making physical tests of bituminous cements and road oils.

The cement testing laboratory, also located in Mechanical Hall, is equipped with convenient iron-topped tables for mixing, intended to accommodate six students each. Apparatus is provided sufficient for making all the standard A. S. C. E. tests, as well as for some additional experiments. There are a large number of briquette, cube, and special cylinder molds, three Vicat needles, Gillmore needles, screens, including a standard set, damp closet, aging tanks, boiling test apparatus, autoclave, briquette molding machine, a 1000-pound Fairbanks cement-testing machine, permeability apparatus for testing various mixtures or water-proofing compounds, and small apparatus including balances, specific gravity flasks, trowels, sampling irons, etc.

The steam laboratory, located in the New Heating Plant, contains the following machines: a 7x8 throttling engine used principally for experiments on valve setting, a 9x10 Ideal automatic high-speed engine driving a 30 KVA, 3-phase generator, a 15 b. h. p. two-stage Kerr turbine, an 8x18 simple Murray Corliss engine, and a 6¼ and 10½x6¼ Sturtevant vertical compound engine. The last three of these are so arranged that they may be run either condensing or with atmospheric exhaust. The condenser

and vacuum pump are so equipped that the cooling water may be measured by means of a Venturi meter and the condensed steam by a Kennicott water-weigher. The engines are all fitted with gauges, sampling pipes, indicator connections, and brakes of various types.

For tests on boilers and their auxiliaries there are available the equipments of both the old and the new heating plants. The former consists of three Flanner water-tube boilers, aggregating seven hundred horse-power. These are coal fired and fitted with modern auxiliary equipment, including feed water meter, ash handling system, draft gauges, thermometer wells, flue gas sampler, etc. In the old plant there are three fire-tube boilers of about 170 horse-power, total capacity, for which cordwood and waste from the College wood shops are used for fuel.

Of smaller power laboratory equipment there may be mentioned a General Electric steam meter, pressure gauge tester, Schaeffer and Budenberg indicator calibrating device, seven indicators including a Trill instrument for continuous diagrams, several reducing wheels, two steam calorimeters, Parr and Emerson fuel calorimeters, sargent gas calorimeter, flue gas analysis apparatus, two pyrometers, draught gauges, recording and indicating pressure gauges, etc.

For work on power transmission, a transmission dynamometer and a special belt-testing machine are provided. Tests may also be made on lubricants, bearing metals, and different types of bearings, by means of a Golden bearing and oil dynamometer, or a pendulum type oil-testing machine. There are also at hand the usual minor pieces, as flash point apparatus, viscosimeters, etc.

The gas engine and hydraulic laboratory is located in the old Power Plant building. The gas engine equipment consists of nine four-cycle and three two-cycle gasoline and oil engines, and an 8-inch Reeco-Ericson hot-air engine. All of these are especially fitted for testing and demonstration, the largest, a 20-H. P. Bessemer oil engine, being direct connected to a high pressure pump. In the same room are also installed a Gardner air compressor and two centrifugal blowers for work on air compression and transmission. The hydraulic section contains the following: a centrifugal pump driven by a rated variable speed motor, several steam pumps, a 4x6 Goulds triplex pump, 12-inch Doble laboratory water motor, two hydraulic rams, 2-inch Venturi meter, current meter, two ordinary service meters, calibrating tanks, orifice boxes

with suitable plates and orifices, weirs, hook gauge, and other small apparatus. In addition to work in the laboratory, measurements and tests of neighboring streams and installations may be made.

The following courses are offered:

201. Applied Mechanics Laboratory. A study of experimental investigation, reduction of data, mechanical calculating devices, and the preparation of neat, concise, and accurate reports. The calibration of various measuring instruments such as gauges, pyrometers, transmission dynamometers, etc., is then taken up. After this follow exercises in the measurement of power, including a test of the transmitting capacity and slip of belting. Transverse, tensile, compressive, torsion, and other standard tests of the common materials of construction are made; the heating value of a sample of coal is determined; the course being then concluded by two exercises on the properties of an assigned lubricating oil.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. Statics and Dynamics, (M. E. 251), and Elements of Thermodynamics (M. E. 319), should also be taken in conjunction with this course. Course in Mechanical Engineering; junior year; first semester; 3 credits apportioned as follows: preparation, $\frac{1}{2}$ credit; laboratory, 1 credit; report, $1\frac{1}{2}$ credits. Fee \$3.00. Text: Carpenter and Diederichs, Experimental Engineering.

202. Power and Hydraulic Laboratory. A continuation of course 201, beginning with the use and calibration of the indicator and planimeter. Tests are then made on steam and gas engines, a boiler, an impulse water wheel, pumps, an air compressor, and other power equipment. Exercises are given in the setting of Corliss and slide valves, and the course is concluded with an economy test of a steam turbine operating condensing.

This work is covered in fifteen laboratory exercises, one each week, and a careful report of each experiment is required.

Prerequisite: Exp. E. 201. Thermodynamics (M. E. 320), must be taken in conjunction with this course. Course in Mechanical Engineering; junior year; second semester; 3 credits; apportioned as for course 201. Fee \$3.00. Text: Carpenter and Diederichs, Experimental Engineering.

203. Advanced Mechanics Laboratory. A rather general course in experimental mechanics dealing with more advanced studies of materials, fuels, lubricants, bearing metals, belting, etc.,

with special reference to the application of the results to the requirements of the mechanical engineer in actual practice. Reports required.

Prerequisites: Exp. E. 201 and 202. Course in Mechanical Engineering; senior year; first semester; 3 credits, apportioned as for courses 201 and 202. Fee \$3.00. Texts: Carpenter and Diederichs, Experimental Engineering. G. B. Upton, Materials of Construction.

204 Advanced Power Laboratory. A course dealing with steam, gas, and hydraulic machinery. Various tests and studies are made on the following: a triplex pump, an air compressor, a centrifugal blower, a steam turbine, a compound engine; a complete test of a simple condensing Corliss engine, including the heat balance and an application of Clayton's analysis. Following this there are eight exercises on internal combustion engines of various types, including two- and four-cycle gasoline and oil engines, various types of automobile and marine engines, and finally a complete test of an oil engine of the semi-Diesel type. Complete reports are required as in the other courses previously listed.

Prerequisite: Exp. E. 203. Course in Mechanical Engineering; senior year; second semester; 3 credits, apportioned as for the preceding. Fee \$3.00. Text: Carpenter and Diederichs, Experimental Engineering. Assigned references.

205. Applied Mechanics Laboratory. Fifteen experiments consisting of exercises selected chiefly from courses 201 and 203. A course designed especially for the seniors in Electrical Engineering.

Prerequisites: Phys. 101 and 102, Math. 51 and 52, and all of the Mechanical Engineering courses required of Electrical Engineering juniors. Heat Engines and Boilers (M. E. 318) should precede this course. Course in Electrical Engineering; senior year; first semester; 3 credits, distributed as for course 201. Fee: \$3.00. Text: Moyer, Power Plant Testing.

206. Power and Hydraulic Laboratory. Similar in grade and purpose to the preceding. Consists of exercises selected from courses 202 and 204.

Prerequisite: Course 205. Course in Electrical Engineering; senior year; and course in Chemical Engineering, junior year; second semester; 3 credits, apportioned as in the preceding. Fee \$3.00. Text: Moyer, Power Plant Testing.

207. Applied Mechanics Laboratory. This course is similar, in range of equipment studied, to course 201, but since it is intended for students in the Industrial Arts course who do not have some of the theoretical work in power engineering, the work is taken up in a more general manner, stress being laid on those principles and details which are of special value to the teacher of manual training. Some time is also taken to explain the theory involved, and the students are taught to prepare neat and accurate reports of their work.

Prerequisites: Math. 11, and Phys. 1 and 2. Course in Industrial Arts; senior year; first semester; 3 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 2 credits. Fee \$3.00. Text: Moyer, Power Plant Testing.

208. Power and Hydraulic Laboratory. A course similar in grade to the preceding, designed for seniors in the Industrial Arts course. The work consists of fifteen laboratory exercises along the lines of those for course 202, and the usual reports are required.

Prerequisite: Exp. E. 207. Required in Industrial Arts; senior year; second semester; 3 credits, apportioned as for course 207. Fee \$3.00. Text: Moyer, Power Plant Testing.

210. General Engineering Laboratory. A course designed for seniors in Mining Engineering and Ceramics, or for others who desire a brief, comprehensive course in mechanical laboratory practice. The work consists of ten exercises selected from courses 201 and 202, and embraces tests on materials, hydraulic machinery, and steam and gas engines. Reports are required as in the preceding.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. Courses in Mining Engineering and Ceramics; senior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 1 credit. Fee \$2.00. Text: Moyer, Power Plant Testing.

225. General Materials Testing Laboratory. A course designed especially for students in Chemical Engineering, and for others desiring a general course dealing with a wide range of materials, methods, and equipment. The purpose is to cover those tests on materials which the industrial chemist in a commercial or city testing laboratory is required to make. Methods standardized by the American Society for Testing Materials and other recognized organizations, are used throughout. The work consists of fifteen exercises including tests on cement, bituminous and non-bituminous road materials, structural materials, lubricating oils, and fuels.

Prerequisite: M.E. 251 should be taken in conjunction. Course in Chemical Engineering; senior year; first semester; or elective to suitably prepared students in other courses; 3 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 2 credits. Fee \$3.00. Text: Assigned references.

231. Cement and Highway Laboratory. An experimental study of Portland cement; standard A. S. T. M. and other methods of cement testing; examination of sands, grading of aggregates, determination of voids, etc., abrasion, hardness, toughness, cementing value, and other tests on macadam rock; tests of paving brick; standard tests on bituminous compounds and paving aggregates.

This course is of broad scope, but is still sufficiently detailed to give the student a good working basis for the intelligent interpretation and preparation of specifications for the materials treated.

Prerequisites: Phys. 101 and 102 and Math. 51 and 52. Roads and Pavements, (C. E. 405), should be taken in conjunction with this course. Courses in Civil, Highway, and Irrigation Engineering; junior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 1 credit. Fee \$3.00. Text: Hatt and Scofield, Laboratory Manual for Testing Materials. U. S. Office of Public Roads' Bulletins, No. 314 and 347. Hubbard, Laboratory Manual of Bituminous Materials.

232. Structural Materials Laboratory. Standard tests of timber, iron, steel, brick, stone, etc., with special reference to the methods and specifications adopted by the American Society for Testing Materials, and other national engineering organizations. Following the general tests, some time is devoted to work on plain and reinforced concrete.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. This course should be preceded by course 231, and Strength of Materials (M. E. 252), should be taken in conjunction with it. Courses in Civil, Highway, and Irrigation Engineering; junior year; second semester; 3 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 2 credits. Fee \$3.00. Text: Hatt and Scofield. Laboratory Manual for Testing Materials. Mills, Materials of Construction.

233. Advanced Highway Laboratory. Following course 231, and designed particularly for those specializing in Highway Engineering. Different road and paving materials and binders are tested and their relative values determined. Sheet asphalt mix-

tures and bituminous mortars are studied, to determine the effects of various changes in the grading of the aggregates. Finally, samples of various types of roads and pavements are analyzed for density, composition, and grading, with special reference to their conformity with specifications under which built.

Prerequisites: Exp. E. 231, and C. E. 405. Course in Highway Engineering; senior year; first semester; 2 credits, apportioned 1 to laboratory work and 1 to report. Fee \$3.00. Text: Hubbard, Laboratory Manual of Bituminous Materials. Assigned reference.

235. Advanced Materials Laboratory. An advanced course offered as an elective to students who have completed course 232, and who desire additional laboratory work on materials. In the past, tests have been made on reinforcing steel, reinforced beams, hooped columns, water-proofing of concrete, thermal conductivity of concrete, study of stresses by strain gauge, etc., but the course is varied according to the special interests and desires of the students electing the work.

The course on Reinforced Concrete (C. E. 557), must either precede this course or be taken at the same time. The course cannot be given unless elected by at least five students. Second semester; 2 credits: laboratory, 1 credit; report, 1 credit. Fee \$3.00. Text: Mills, Materials of Construction.

238. Timber Testing. A special course designed to meet the requirements of the students in Forestry. The work is covered in eight laboratory exercises, embracing cross-bending, compression, shearing, cleavage, and other standard tests of timber; a study of the effect of moisture content on strength; and a study of impact loads. The formulas for the reduction of data from tests are explained; and the students are taught the preparation of neat, accurate reports, such being required on all tests. In general, the methods and bulletins of the U. S. Forest Service will be used as a guide in the work.

Prerequisites: Phys. 1 and 2. Course in Forestry; senior year; second semester; 1 credit. (Note: The work is covered in one three-hours laboratory period a week during the first half of the semester, for which one-half credit is allowed. The other half credit is given for the reports.) Fee \$2.00. Text: Record, Mechanical Properties of Wood.

241. Concrete Laboratory. An elective course designed for those desiring instruction in the testing and proportioning of con-

crete-making materials. The first half of the course is the same as that of course 231 including principles of sampling, testing of cement and sands, grading of aggregates, etc. The latter part of the course includes tests on reinforcing steel, reinforced beams, water-proofing compounds, thermal conductivity of concrete, and concrete analysis.

Prerequisites: Physics 101 and 102, and Math. 51 and 52. Especially designed as an elective for seniors in Electrical and Mechanical Engineering, but suitable for students in other courses as well. First semester; 2 credits, apportioned 1 to laboratory and 1 to report. Fee \$3.00. Text: Taylor and Thompson, Concrete, Plain and Reinforced. Assigned references.

246. Metallography and Technical Pyrometry. A course of lectures and laboratory work designed to give a working knowledge of the methods of study of structure of metals and alloys. Particular attention is given to the correlation of thermal and mechanical treatment with the structure and physical properties of iron and steel. In connection with thermal analysis and heat treatment practice, the calibration and use of various types of pyrometers are taken up. A practical knowledge of the subject is obtained by laboratory experiments in heat treatment, preparation of specimens, etching, studying the structure under the microscope, and taking photo-micrographs. Whenever possible, physical tests are made to show the effects on strength, ductility, hardness, or other mechanical properties of the different thermal treatments or other industrial processes.

Elective in the course in Chemical Engineering, senior year; also elective to other suitably prepared students. Second semester; 3 credits, apportioned 2 to lectures and preparation, and 1 to laboratory. Fee \$3.00. Text: Sauveur, Metallography and Heat Treatment of Iron and Steel. Assigned references.

255. Steam Laboratory. A brief practical course on steam engines, boilers, and auxiliaries, intended for students in Logging Engineering. The work consists of eight exercises, including tests and studies of the following: pressure and vacuum gauges; steam calorimeters; injectors and feed pumps; boilers; slide-valve, automatic, and Corliss engines. A report is required for each exercise.

Note: Heat Engines and Boilers (M. E. 317), must be taken in conjunction with this course.

Course in Logging Engineering; junior year; first semester; 1 credit. Fee \$2.00.

262. Hydraulic Laboratory. Study of methods of measuring water, calibration of weirs, orifices, water meters, etc. Determination of friction and loss of head in pipe lines and fittings. Study of water hammer, and test of hydraulic ram. Tests on water wheel, centrifugal, triplex, and other pumps. The work is covered in fifteen three-hours laboratory exercises, and a report of each test is required.

Prerequisites: Math. 51 and 52, and I. E. 102. Course in Irrigation Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit. Fee \$2.00.

265. Hydraulic Laboratory. A brief course of a practical nature intended to accompany the course in Hydraulics (I. E. 101), for students in Drainage and Irrigation. Studies and tests are made on the following: pressure and vacuum gauges; methods of measuring water; flow of water through pipes and orifices; hydraulic ram; water wheel; and various types of pumps. The work is covered in eight laboratory exercises, a report being required for each.

Note: Hydraulics, I. E. 101, must be taken in conjunction with this course.

Course in Drainage and Irrigation; senior year; first semester; 1 credit. Fee \$2.00.

272. Gas-Engine Laboratory. Study of internal combustion engine fuels, mechanical details of engines, battery and magneto ignition systems, carburetors, and methods of governing. Analysis of gas engine cycles from indicator diagrams. Mechanical efficiency, regulation, and fuel economy tests. Economy, power, and tractive effort of automobiles. Complete test of oil engine of the semi-Diesel type.

The work is covered in ten laboratory exercises, and a report is required for each.

Prerequisite: Physics 101 and 102 or an equivalent. It is recommended that the course on Internal Combustion Motors (M. E. 346) either precede the course, or be taken in conjunction with it. An elective course; either semester; 2 credits, apportioned 1 to laboratory and 1 to reports. Fee \$2.00. Text: Streeter, Internal Combustion Motors.

291. Experimental Research Problems. An opportunity is given for advanced and suitably prepared students who are interested in engineering research, to work out original problems. These may be either of their own choosing, or suggested by the department, and may cover any subject within the scope of the department laboratories.

Prerequisites: Must be approved in each case, as they would vary with the work proposed. Elective to seniors and graduate students; first semester; 2 credits. Fee to be arranged.

292. Experimental Research Problems. A continuation of course 291.

Elective to seniors and graduate students; second semester; 2 credits. Fee to be arranged.

INDUSTRIAL ARTS

HENRY CLAY BRANDON, Professor
WILLIAM McCAULLY PORTER, Instructor
AMBROSE ELLIOTT RIDENOUR, Instructor
CHARLES GEORGE WILTSHIRE, Instructor
* DARWIN GREENE THAYER, Instructor
MARTIN LEWIS GRANNING, Instructor

There is a steadily increasing demand in Oregon for competent teachers of manual training. These instructors teach in both the elementary and high-school grades. In fact, the up-to-date school provides for manual, or constructive, work of various kinds from the first grade up. The well-trained teacher must therefore understand both the technique and theory of his subject as adapted to the needs of pupils.

Below the seventh grade this manual instruction for both boys and girls is given by the regular grade teachers; but the supervisor and special teacher of manual training should be able to organize this work and correlate it with the other school subjects, and particularly with the later formal course in manual arts. For the boys, this will take the form of instruction in woodworking, metals, machine shop, and in some schools, vocational training in the various trades. For the girls, it will lead to the study of the several phases of home economics.

A college degree course of the same general standard as the other B. S. courses is provided, in order that the young men who specialize in this field may receive a preparation that will place them on a par with high-school teachers in other branches. The relation of industrial instruction in the elementary and secondary schools to the industries of life, is more fundamental and direct than most of the other branches taught. It also has its important relations to higher education. It becomes necessary, therefore, to give these instructors a training that will make them more than masters of the mechanical processes.

The properly prepared teacher of industrial arts must have an appreciative understanding of the origin and development of the industries; their relation to economic, social, and political life; and a profound conviction of the importance and dignity of their contribution to the progress of mankind. He should also have the broad sympathies of the cultured man, in order to enable him to

* On leave of absence.

set before his pupils high and worthy ideals of life. The artisan, artist, or professional man is first of all a man and a citizen, and our schools must make him aware of his high privileges and responsibilities.

The Industrial Arts department is a part of the School of Engineering and has under its supervision all the shop courses offered in the other departments of the College.

Equipment. This department provides the necessary equipment for carrying on the different lines of shop work in the degree and vocational courses.

The Wood Shop, supplied with the best machines and tools the market affords, contains twenty-four double benches of modern design, accommodating forty-eight students. Each bench is provided with patent rapid action vises for holding the work, and is furnished with two sets of hand tools, consisting of rip saws, cutoff saws and backsaws, planes, chisels, marking gauges, try-squares, hammers, dividers, and oilstones. The machine equipment of this shop consists of fifteen wood-turning lathes, each furnished with a set of tools; one iron saw-table with rip and cut-off saws, one hand saw, one jig saw, 24-inch surface planer, 16-inch glue joiner, one hollow chisel mortiser and one belt sander, built by the students, and two grindstones. There are also two glue tables with clamps of various sizes, two electric glue heaters. The power is furnished by two three-phase induction motors of 15- and 5-horse-power.

The Forge Shop contains forty-two down-draught forges of the most approved pattern. Blast is furnished by a steel pressure blower driven by a 10-horse-power induction motor, and the smoke and gases are removed by an 80-inch exhaust fan, driven by a 20-horse-power motor. Each forge is provided with anvil, hammers, hardies, tongs, and other small tools. An emery grinder, built by students, has been added to the equipment. There are also swedge blocks and vises at convenient points in the room for general use.

The Machine Shop contains one 24x24-inch iron planer, one 15-inch shaper, one 12-inch shaper, one universal milling machine, one universal tool grinder, one wet tool grinder, one radial drill, one 20-inch drill press, one sensitive drill press, one 20-inch engine lathe, one 16-inch engine lathe, one 16-inch universal turret lathe, one 14-inch modern geared lathe, five 14-inch engine lathes, two 10-inch speed lathes, one shop saw, one automatic knife grinder,

and twelve bench vises. A 20-horse-power induction motor furnishes the power. A tool room adjacent contains the small tools, such as twist drills, taps, dies, reamers, calipers, gauges, and scales. These tools are given out to the students on the check plan.

The Plumbing and Steam Fitting Shop is equipped with all of the hand tools necessary for cutting, threading, and general pipe work, as well as gasoline torches, soldering outfits, and other apparatus for making lead-pipe connections and wiped joints.

The Foundry contains a 22-inch Colliau cupola having a capacity of two tons per hour, one 1200-pound crane ladle, one 800-pound crane ladle, bull ladles, and hand ladles, one 16-inch brass furnace, brass molder's tub, crucibles, one large core-oven, one portable core-oven, one two-ton jib crane, one wall crane for charging floor, one Delano pulley molding machine No. 2, besides shovels, rammers, and small tools to accommodate twenty students at one time. An emery grinder, built by the students, has been added.

DEGREE COURSE IN INDUSTRIAL ARTS

Freshman Year	Semester	
	1st	2nd
Modern English Prose (Eng. 81, 82).....	3	3
Trigonometry (Math. 12).....		3
Commercial Geography (Com. 200).....	3	
General Chemistry (Chem. 100, 101).....	3	3
Shop Drawing (Ind. Arts 301, 302).....	2	2
Manual Training (Ind. Arts 103, 104).....	3	3
Industrial Arts Drawing (Art 411).....		2
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....	$\frac{1}{2}$	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. E. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	Semester	
	1st	2nd
Sophomore Year		
Modern Language or Approved Elective.....	3	3
General Physics (Phys. 1, 2).....	3	3
Patternmaking, Foundry (Ind. Arts 135, 174).....	3	3
Woodwork (Ind. Arts 113).....	2	
Industrial Arts Design (Art 412).....	1	
Drawing (M. E. 156).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Electives	3	3
	<hr/>	<hr/>
	16 $\frac{1}{2}$	16 $\frac{1}{2}$

Junior Year		
Modern Language or Approved Elective.....	3	3
General Psychology (Ind. Ed. 101).....	3	
Principles of Education (Ind. Ed. 131).....		3
Educational Psychology (Ind. Ed. 102).....		2
Forging (Ind. Arts 155).....	2	
Hammered Metal Work (Ind. Arts 156).....		2
Elementary House Planning (Arch. 701).....	3	
Descriptive Geometry (M. E. 152).....		3
Commercial Woods (For. 506).....	2	
Plumbing (Ind. Arts 270).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives	2	
	<hr/>	<hr/>
	17	17

Senior Year		
Special Methods (Ind. Ed. 172).....		2
History and Theory of Vocational Education (Ind. Ed. 125)	2	
Machine Shop (Ind. Arts 208, 209).....	2	2
Manual Training for Elementary Grades (Ind. Arts 231).....		2
Machine Drawing and Design (M. E. 207).....	3	
Applied Mechanics Lab. (Exp. E. 207).....	3	
Power and Hydraulics Lab. (Exp. E. 208).....		3
Electives	6	7
	<hr/>	<hr/>
	16	16

The following courses are offered:

103. Manual Training. Designed to meet the needs of those students who desire to teach manual training in the sixth, seventh, eighth, and ninth grades of the public schools. A course in wood construction and design, including theory and practice in the proper use of tools; a study of the growth and structure of woods; shrinkage, warpage, and seasoning of timber; staining and finishing. Considerable attention is given to a study of shop methods, equipment, courses of study, and proper methods of conducting class work.

Course in Industrial Arts; freshman year; either semester; 3 credits; 3 laboratory periods. Fee \$6.00. Deposit \$1.00. Text: Griffith, Essentials of Woodwork.

104. Manual Training. Continuation of 103; freshman year; either semester; 3 credits; 3 laboratory periods.

Fee \$6.00. Deposit \$1.00. Text: Griffith, Essentials of Woodwork.

106. Woodwork. The purpose of this course is to give instruction in the care and use of modern woodwork benches and their equipment. Six lectures will be given in this course, each lecture followed by a practical application. Skill in the manipulation of tools cannot be obtained in this short time, but instruction and practice will be given in sharpening chisels, planes, and other edge tools; in jointing, setting, and filing handsaws.

The principal feature of this course will be the instruction and practice in the use of the steel square in brace work and rafter construction.

Elective, course in Agriculture; freshman year; first or second semester; 1 credit; 1 laboratory period. Fee \$2.00. Deposit \$1.00.

110. Woodwork. A course for Logging Engineering students, consisting of a series of constructive exercises in carpentry and joining, accompanied by lectures dealing with the care and use of bench tools, and the proper method of laying out work.

Logging Engineering course; freshman year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

111. Woodwork. A continuation of course 110 for Logging Engineering students. This course takes up the use of the steel square in building construction, and the design and construction of trestles, trussed roofs, and timber bridges.

Logging Engineering course; freshman year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

113. Woodwork. Correct use of the steel square in laying out practical carpenter work, windowsills and doorsills, bay and circular windows, steps, stairs, etc.; detailed construction of the window and door frames, sills, caps, weights, and fastenings in relation to the rough framework and the exterior and interior finish of the building are taken up.

In like manner, the construction of cornices, gutters, brackets, columns, and newel posts is taken up. As soon as the students become familiar with the detailed construction of the above, they are assigned problems involving original design and construction. Practice in reading plans, filling out material bills, and estimating the cost of material and labor, is a strong feature of the course. So far as possible, drawings furnished by the architectural department are used in this work.

Industrial Arts and elective; sophomore year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

116. Cabinetwork. This course consists of the designing and construction of furniture according to the ability of the individual student. Mixing of stains, fillers, and various finishes, with their application, is a strong feature of the course.

Included in the work is a study of the design and construction of drawers and panel work, and primary upholstery.

Elective; freshman year; either semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

131. Patternmaking. This course consists of a series of exercises in planing and chiseling to familiarize the student with the proper use of tools; of practical exercises emphasizing the necessity of draught, core prints, core boxes; of exercises showing the necessary allowance for shrinkage of iron and other metals, and its effect on different shapes and thicknesses of castings. Exercises in wood-turning are given in conjunction with lectures on the lathe, its care and management, and the care and use of turning tools. From the simple exercise the student soon advances to the construction of patterns of parts of machinery and other structures, such as pulleys, pipe fittings, valves, gear wheels, dynamo frames, gas and steam engines, lathes, emery grinders, and other pieces of machinery.

The lectures explain the correct methods of constructing the more complicated work, the principles of molding directly related to patternmaking, shrinkage of metals, kinds of lumber best suited for patternmaking, the working and twisting of woods, glue and

metal fastenings, making cores and core boxes, methods of marking and storing patterns, estimating the weight of metal castings.

Course in Mechanical and Electrical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: International Correspondence School pamphlets.

132. Patternmaking. This course and the following are a continuation of Patternmaking and are intended for engineering students who desire to devote further time to the subject, or for those who are engaged in the preparation of these, or construction work.

The work will consist largely in making patterns for steam and gas engines and other complicated machines.

Elective; first or second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

133. Patternmaking. This course is offered to students having had the equivalent of a two-credit course in patternmaking, and comprises the construction of the more complicated patterns and core boxes necessary for the building of steam and gas engines or other machine parts.

Elective; first or second semester; 1 credit; 1 laboratory period. Fee \$2.00. Deposit \$1.00.

134. Patternmaking. Continuation of course 132.

Elective; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

135. Wood Turning and Patternmaking. The principles of wood turning are taken up with reference to their application to the useful arts. This leads to patternmaking, which forms the greater part of the semester's work. One hour a week is used for shop lectures and recitations upon topics of vital importance to the work, such as selection of material, fastenings and joints, shrinkage of wood, allowance for shrinkage of metal, etc.

The course in Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods. Fee \$6.00. Deposit \$1.00. Text: International Correspondence School pamphlets.

136. Patternmaking. This is a continuation of course 135, and is intended for those who desire to obtain a more detailed knowledge of the subject. The student has opportunity to enter more fully into constructive work in patternmaking, by making patterns

and core boxes for parts of machines to be built in the College shops.

Elective; junior or senior year; first or second semester; 3 credits; 3 laboratory periods. Fee \$6.00. Deposit \$1.00.

138. Wood Turning. This course consists of a series of exercises in wood turning intended to familiarize the student with the various uses of the lathe tools, methods of centering and chucking, segment work, staining, and polishing. Small pieces of furniture such as vases, bowls, rings, trays, tables, and stools will be worked out.

Elective Industrial Arts course; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

151. Blacksmithing. The student is taught to make and manage the forge fire; to shape iron by bending, upsetting, drawing, and welding. Many useful articles are made, consisting of hooks, staples, rings, clevises, and chains.

Logging Engineering, Mechanical Engineering, and Electrical Engineering; sophomore year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00.

152. Toolmaking and Tempering. This course is devoted to the study of the heat treatment of steel as exemplified in making and tempering tools, springs, and other articles of steel.

Prerequisite: Course 151. The course in Mechanical Engineering; sophomore year; second semester; 1 credit; 1 laboratory period. The course in Logging Engineering; sophomore year; second semester; 1 credit; 1 laboratory period. Fee \$2.00.

153. Blacksmithing. A course for students in Agriculture. After completing the first exercise, the student enters upon work having direct application to farming, such as the mending of farm implements, making and mending of chains, clevises, and hooks; ironing of whiffletrees and neck-yokes; sharpening of tools.

Elective; Agricultural course; sophomore year; first semester; 1 credit; 1 laboratory period. Fee \$2.00.

154. Blacksmithing. A continuation of course 152, for students wishing to take an entire year of blacksmithing.

Elective; sophomore year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00.

155. Forging. This course deals with the equipment of the blacksmith shop, and includes exercises in bending, shaping, upset-

ting, and welding iron. Some instruction is given also in hardening and tempering steel, and in brazing. The course is accompanied with lectures on the management of the fire, methods of construction, and shop equipment.

The course in Industrial Arts; junior year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00.

156. Hammered Metal Work. This course consists of hand-wrought metal and enamel work, including hard and soft soldering, the formation of bowls, trays, boxes, lamp shades. The design and construction of furniture fittings.

The course in Industrial Arts; junior year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00.

158. Forging and Tool Dressing. After the minimum amount of preliminary work in forging iron, the remainder of the time is devoted to making, tempering, and dressing chisels, drills, and other steel tools.

The courses in Chemical Engineering and Mining Engineering; freshman year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00.

171. Foundry Practice. This course includes a study of the foundry equipment; care and management of cupolas; mixing and melting of iron; molding in green and dry sand; preparation of cores; casting in iron and brass.

The course in Mechanical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Text: International Correspondence School Pamphlets.

173. Foundry Practice. A course in all respects equivalent to course 171.

The course in Electrical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Text: International Correspondence School Pamphlets.

174. Foundry Practice. More comprehensive than course 171.

Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods. Fee \$6.00.

175. Advanced Foundry Practice. Continuation of 171 and 173.

Elective; 2 credits; 3 laboratory periods. Fee \$4.00.

202. Machine Shop. The work in the machine shop includes both bench and machine work. Upon first entering the shop the

student is taught the principles of chipping, filing, and hand finishing. This occupies the first half of the semester. Machine work is then taken up through a series of exercises on lathe, shaper, planer, drill press, and milling machine. One hour of the student's time is required each week in the class room to attend lectures, work problems, or prepare other work assigned by the instructor.

The courses in Mechanical and Logging Engineering; sophomore year; second semester; 1 credit; 1 laboratory period. Fee \$2.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

203. Machine Shop. A continuation of course 202 devoted to machine construction and milling machine work. Special attention is paid to economical shop methods of doing work.

The course in Mechanical Engineering; junior year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

205. Machine Shop. This and the following courses are a continuation of 203.

Mechanical Engineering course; second semester; 3 credits; 3 laboratory periods. Fee \$6.00. Deposit \$1.00.

206. Machine Shop. A course similar to course 202, designed to meet the requirements of students in Electrical Engineering.

The course in Electrical Engineering; sophomore year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

207. Machine Shop. Continuation of 206.

Elective; Electrical Engineering students; junior year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

208. Machine Shop. This course begins with the hand processes of chiseling, filing, and polishing, which are followed by a detailed study of the lathe, drill press, planer, and shaper, taught by means of carefully planned exercises. The course includes one hour a week of lecture or recitation work to supplement the instruction given in the shop.

The course in Industrial Arts; senior year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

209. Machine Shop. A continuation of course 208 in which the student becomes familiar with the more complicated machines such as turret lathes, and milling machines. Shop methods are

studied with reference to economical production. The student, as far as possible, enters upon construction of machinery and apparatus for College equipment.

The course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

212. Machine Shop. Similar to 202.

Elective; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

213. Machine Shop. Continuation of 212.

Elective; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

215. Automobile Maintenance, Repair, and Operation. This course is intended for those students who wish an intimate knowledge of the process of overhauling and repairing of automobiles. Considerable attention will be given to the various types of construction as employed in machines of different manufacturers. Machines will be taken apart and overhauled by the students.

Elective, first and second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

228. Dairy Mechanics. This course is arranged for the students of Dairy Manufactures. An attempt is made to give in a brief way through lectures and laboratory work, a knowledge of plumbing, setting of line shafting, and the operation and repair of machinery, electric wiring, and the operation of electrical machinery. This work is given by instructors in the plumbing and machine shops, and in the electrical laboratory.

Dairy Manufacturers; senior or junior year; second semester; 1 credit; 1 laboratory period. Fee \$2.00.

231. Manual Training for Elementary Grades. This course deals with the design and construction of cardboard work, weaving, basket and mat work, stencil cutting, bookbinding, and other industrial subjects such as are taught in the first six grammar grades.

Prerequisite or parallel: Ind. Ed. 171. Course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods.

270. Plumbing. Course similar to M-1.

Elective; 2 credits; 2 laboratory periods; first and second semesters. Fee \$4.00.

301. Shop Drawing. This course is intended for those students who are specializing in Industrial Arts. In the beginning the work is devoted to the learning of the elements of drawing, the general use of the drawing instruments, lettering, general constructions, methods of representation and free-hand sketching. Considerable attention will be given to drawing of pieces of furniture and constructions in wood that may be worked out in the shops.

Course in Industrial Arts; first semester; 2 credits; 2 laboratory periods.

302. Shop Drawing. Continuation of 301.

Second semester; 2 credits; 2 laboratory periods.

MECHANIC ARTS

This is a vocational course extending through three years, during which the student devotes at least one-third of his time to shop work and trade drawing. English, mathematics, chemistry, physics, and elementary economics are also included in order to balance the course and give it educational value.

The student is permitted to specialize in the vocational work according to his individual preferences and qualifications. The choice of work includes Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

This is not to be regarded as a preparatory course for the degree courses in engineering. Such preparation can best be obtained in the regular accredited high schools of the State. Neither is it intended that this course shall entice students away from the high schools, but that it shall fill a need not generally provided for by the secondary schools of the State.

It is the purpose of this course to assist those who expect to make their way in the world by their manual skill in various lines of activity—those who feel that they cannot afford to take a degree course in college, but desire to get some vocational training in special lines, and at the same time secure the broadening influence of education in English, mathematics, and elementary science. While it is not the primary aim to train foremen and superintendents, it is believed that students after completing the course and gaining a few years of practical experience will be able to hold positions of responsibility, or to go into business for themselves.

The shops are equipped with the latest approved machinery and are well suited to carry on these practical courses.

This work is open to students who have completed the eighth grade, or equivalent, of the common schools, and who are sixteen years of age. Those who complete the three years of work and take all of the work outlined will be entitled to a diploma. In order to secure a diploma in Patternmaking, Carpentry and Cabinetmaking, Machine Shop Practice, or Plumbing, at least two years must be devoted to the desired subject. The other year may be devoted to selected courses subject to the approval of the head of the department. A general shop course may be taken by combining one year of Machine Shop, one year of Blacksmithing, and one year of Foundry Work; or one year of Woodworking, one year of Foundry, and one year of Machine Shop.

VOCATIONAL COURSE IN MECHANIC ARTS

	Semester	
	1st	2nd
First Year		
Vocational English (Eng. G, H).....	3	3
Algebra (Math. A, B).....	5	5
Elementary Commercial Geography (Com. H).....	2	
Elementary Industrial History (Com. K).....		2
Vocational Drawing (M. E. A-1, B-1).....	2	2
* Shop Work (According to trade selected).....	4	4
Drill (Military A, B).....	1	1
Gymnasium (Phys. Ed. 11, 12).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Second Year		
Advanced Vocational English (Eng. I, J).....	3	3
Shop Arithmetic (Math. O).....	4	
Plane Geometry (Math. L).....		4
Trade Drawing (M. E. A-2, B-2).....	2	2
Chemistry (Chem. A, B).....	3	3
* Shop Work (According to trade selected).....	4	4
Drill (Military C, D).....	1	1
Gymnasium (Phys. Ed. 13, 14).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

* Shop Work. The student will choose the general line of shop work which he desires to pursue from the following: Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

Third Year	Semester	
	1st	2nd
Geometry and Trigonometry (Math. T).....	4	
Elementary Industrial Problems (Com. J).....		3
Business Law (Com. P).....	2	
Shop Accounting (Com. F).....		2
Trade Drawing (M. E. A-3, B-3).....	2	2
Physics (Phys. A, B).....	3	3
* Shop Work (According to trade selected).....	4	4
Drill (Military E, F).....	1	1
Electives	2	2
	18	17

The following courses are offered:

C-1. Carpentry and Cabinetmaking. The purpose of this course is to teach the pupil the elements of joinery as applied in cabinetmaking and the building trades. The beginning work is devoted to the principles of joining and to tool operations as involved in furniture making and interior finish, including design and construction, the proper use of tools, growth and strength of woods, shrinkage, warpage, and seasoning of timber, staining and polishing. Considerable attention is given to the making of working drawings of simple pieces of furniture which are built in the shops. A study of the steel square and its uses is taken up the second and the third years, and the practical use of the square are given in brace and detail roof construction. This work will be developed through the construction of parts of houses, barns, roofs, and bridges. In like manner, the construction of cornices, gutters, brackets, columns, window frames, and stairways is attempted. The erection of buildings in reduced scale and full-sized section of buildings is a strong feature of the course.

Supplementary lectures will be given upon the proper care of edged tools; the various woods used in building construction, their proper selection and treatment; the measurement of lumber, glues, nails, screws, bolts, nuts, pins, straps, and other fastenings. Roof trusses, spans and braces, and method of calculating their proper sizes; stair building, woodworking machinery, paints, shellacs,

* Shop Work. The student will choose the general line of shop work which he desires to pursue from the following: Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

and varnishes; estimates and practice in working problems that are taken from the student's work, from trade journals and from actual plans and specifications of houses. These are some of the prominent features of the work.

Vocational course; Mechanic Arts.

First year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

D-1. Carpentry and Cabinetmaking. Continuation of C-1.

First year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

C-2. Carpentry and Cabinetmaking. Continuation of D-1.

Second year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

D-2. Carpentry and Cabinetmaking. Continuation of C-2.

Second year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

C-3. Carpentry and Cabinetmaking. Continuation of D-2.

Third year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

D-3. Carpentry and Cabinetmaking. Continuation of C-3.

Third year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

E-1. Patternmaking. The purpose of this course is to teach the elements of machine patternmaking. The student begins his course with exercises involving the use of bench tools, and the reading of working drawings. These exercises emphasize the necessity of draught, core prints, core boxes, of allowance for shrinkage of iron and other metals, and its effect on different shapes and thickness of castings. The student is taught how to join timber to prevent warpage and distortion of patterns by using segments, staves, ribs, etc. He is taught the meaning of trade names, such as boss, fillet, flange, rib, etc.; how to operate power machinery; to keep in repair belts and line shafting; to sharpen planer, and jointer knives, band saws; and how to select materials, such as glue, lumber, shellac, and fasteners.

Much of the constructive work is upon parts of machines that are being built in the College shops, such as pulleys, pipes, fittings,, valves, gear wheels, dynamo frames, lathes, emery grinders, gas engines, and other machinery.

More advanced work includes the calculation, laying out, and construction of globe valves; spur, bevel, and worm gearing propeller blades and cams.

Vocational course, Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00. Text: International Correspondence School Pamphlets.

F-1. Patternmaking. Continuation of E-1.

First year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00. Text: International Correspondence School Pamphlets.

E-2. Patternmaking. Continuation of F-1.

Second year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

F-2. Patternmaking. Continuation of E-2.

Second year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

E-3. Patternmaking. Continuation of F-2.

Third year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

F-3. Patternmaking. Continuation of E-3.

Third year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

G. Woodworking. This is a course in woodworking, including instruction in the care and use of bench tools. The student becomes an adept in the use of the steel square by exercises in brace and rafter cutting and roof framing, followed by lectures on various types of barn constructions. The practical work involves the construction of models of roofs, trusses, buildings and parts of buildings reduced in scale.

Vocational course in Agriculture; first year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

J-1. Course in Forging. The purpose of this course is to teach the principles of forging as applied in the average jobbing shop. It deals with the method of building fires so as to obtain best results in heating; care and operation of fires and forges; the use of tools in the working out of nuts, bolts, bending of eyes, forging staple, gate hooks; bending and welding of rings and links; making of hooks, clevises, and the parts of wagons and farm

machinery; the forging of tools of high carbon steel and high speed steel such as chipping chisels, lathes, shapers, planers, and mill tools; blacksmith's and mechanic's hammers, knives, hatchets, draw knives, and other tools.

Special attention is given to the composition of iron and the various low and high speed carbon steels; and the treatment especially adapted for each grade, to annealing, tempering, and case hardening, with some lectures on the history and production of iron.

The student will have opportunity to get practical repair work on machinery brought in from the College farm — such work as plow sharpening, wagon and machine repairing. In fact, he will come in contact with most of the work that is done in an average jobbing shop.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

K-1. Course in Forging. Continuation of J-1.

First year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

J-2. Course in Forging. Continuation of K-1.

Second year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

K-2. Course in Forging. Continuation of J-2.

Second year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

J-3. Course in Forging. Continuation of K-2.

Third year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

K-3. Course in Forging. Continuation of J-3.

Third year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

L. Blacksmithing. The student enters upon work having direct application to farming, such as the making and mending of farm implements, chains, clevises, and hooks; the ironing of whiffletrees and neck-yokes; the repairing and sharpening of plows and other farm machinery. Short talks and demonstrations are given on the method of building fires so as to obtain the best results in heating, descriptions of fans and forges, the uses of tools for various forgings, and a study of the proper means of heating and treating materials to be used.

Vocational course in Agriculture; first year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00.

M-1. Course in Plumbing. The purpose of this course is to teach the students those things that will meet the needs of the average plumber. The work consists of instruction and practice in the care and handling of tools; in working with fittings, traps, valves, faucets, etc.; in working with sewer, soil, waste, water, and gas lines; in cutting and threading water pipe to measurements, using different fittings; in making fine and wiping solder, and in wiping upright joints; in laying out and constructing plumbing for buildings of two or more stories, including apartments and offices; in making range boiler and other hot-water connections; and in the practical uses of the soldering iron. The following subjects secure attention: joint wiping under varying conditions, sewer pipe laying, farm plumbing with the use of septic tanks, water supply systems, plumbing without the use of lead, sheet lead working, and estimating of plumbing construction.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

N-1. Course in Plumbing. Continuation of M-1.

First year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

M-2. Course in Plumbing. Continuation of N-1.

Second year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

N-2. Course in Plumbing. Continuation of M-2.

Second year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

M-3. Course in Plumbing. Continuation of N-2.

Third year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

N-3. Course in Plumbing. Continuation of M-3.

Third year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

P-1. Foundry. In the foundry course, the importance of foundry practice in the industrial trades is fully recognized. Modern practices and methods, as carried out in the best commercial foundries, are closely followed. The work is varied and is such as to keep students alive with interest and to tax their ability enough to make them think. The course comprises the following: definition and names of tools, characteristics of molding sands, use and care of tools and flasks. The first exercises are intended to familiarize the student with the proper molding condition of the sand

and the correct use of the rammer and other tools. A variety of forms add interest to the work and present progressively the problems of joints, parting lines, follow boards, match plates, gates for molds, pouring basins and shrinkage gates. The patterns in general use are those for the numerous machine projects under development in the Industrial Arts department. Among other things, the student is given work germane to supporting copes, uses of gagers, and the use of solders and how to set them; facings such as sea coal, plumbago, talc, charcoal, and the preparation of facing mixtures; molding with good patterns, broken castings, skeleton patterns; sweeps; molding of sheaves, pulleys, manhole covers, and rings; brackets; gas engine cylinders; lathe beds, in open sand and pit work, are emphasized. In core making are given materials of core making, core mixtures, uses of core boxes, sweeps, core arbors, and core rods, provisions for setting large cores by hand and with crane, methods of venting, core baking, and the painting of cores.

In cupola management the student becomes proficient in preparing the cupola for a heat in charging and pouring off.

The work also includes practice in making castings in brass, bronze, and aluminum, and the making of alloys. Additional lectures are given on malleable castings, loam molding, steel founding, mixing and melting of iron, machine molding, and foundry appliances. The student is taught to keep account of the supplies and labor and be in a position to tell the cost of any article produced in the foundry, also the value of such articles as are turned out of commercial shops.

Vocational course; Mechanical Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00. Text: International Correspondence School Pamphlets.

Q-1. Foundry. Continuation of P-1.

First year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00. Text: International Correspondence School Pamphlets.

P-2. Foundry. Continuation of Q-1.

Second year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

Q-2. Foundry. Continuation of P-2.

Second year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

P-3. Foundry. Continuation of Q-2.

Third year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

Q-3. Foundry. Continuation of P-3.

Third year; second semester; 4 credits; 4 laboratory periods.
Fee \$8.00.

T-1. Machine Shop Practice. For students who specialize in machine shop practice, there is work in chipping and filing straight and plane surfaces, filing two pieces to fit, and instruction in laying off and boring, followed by turning of various kinds of materials at different speeds and estimating of time and cost of work done by using different methods such as with and without gauges, gigs, etc., straight and taper turning, right and left hand thread cutting, single, double, square, and cutting of rack spur bevel and worm gears. There is instruction in the use and classification of gauges, micrometers, and calipers. The advantages of the uses of taps and dies, gigs, and special tools, are taken up; as are also the methods of center squaring, straight and taper turning and fitting, outside and inside screw cutting, chucking and reaming, finishing and polishing, drill tap and mandrel grinding, tap boring, uses of milling machine; tool making, such as taps, reamers, mill cutters, and gauges.

Practical experience is acquired through the construction of machinery, such as lathes, gas engines, steam engines, emery grinders, and through general repair work of the College.

Time cards and stock of material are kept of all work, so that the matter of cost of production is given careful consideration.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00. Deposit \$1.00. Text: Starrett's Hand-book.

U-1. Machine Shop Practice. Continuation of T-1.

First year; second semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00. Text: Starrett's Hand-book.

T-2. Machine Construction. Continuation of U-1.

Second year; first semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00.

U-2. Machine Construction. Continuation of T-2.

Second year; second semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00.

T-3. Tool and Gig Making. Continuation of U-2.

Third year; first semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00.

U-3. Tool and Gig Making. Continuation of T-3.

Third year; second semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00.

MECHANICAL ENGINEERING

GRANT ADELBERT COVELL, Professor
MARK CLYDE PHILLIPS, Associate Professor
OTTO BERGER GOLDMAN, Assistant Professor
JOHN JACOB KARSTETTER, Instructor

The course in Mechanical Engineering has for its purpose the preparation of young men for positions of usefulness and responsibility in the industrial life of the country.

The Pacific Northwest is just now entering upon a period of rapid progress in the building of railroads, the development of water power, the marketing of forest products, and the upbuilding of manufactories, all of which require men conversant with the general principles of engineering. It is the purpose of all engineering courses to contribute to this general advancement, by turning out graduates equipped with the necessary knowledge and skill to make them active factors in this great work.

It is the general plan of the course in Mechanical Engineering to lay a broad foundation in English, Mathematics, Chemistry, and Physics, accompanied by Drawing and Shopwork, during the first two years of the course. The work of the last two years is more technical and professional in its nature, consisting in a study of the principles involved in the development of power by steam engines, water wheels, gas and gasoline engines, and steam turbines. It also involves a critical study of the design of machines and materials entering into their construction, as well as tests to determine their efficiency.

Instruction is given by means of lectures, recitations, and laboratory exercises. The scientific principles involved in machines and mechanical movements are investigated with reference to the solution of problems in mechanical engineering. In the shops, the student learns the use of tools and the value of different methods of doing work from the standpoint of economical construction. In the draughting room, he learns to make working drawings and blueprints of machines, and to formulate designs of his own.

With these advantages to aid him, the ambitious student should be able to take and maintain a position in the general industrial and engineering development which is the leading and characteristic feature of the age in which we live.

Equipment. The laboratory equipment for this department in mechanics and power measurement, is described under Experimental Engineering. The shops are under the supervision of the department of Industrial Arts.

In addition to equipment listed under these two departments, there are two large draughting rooms, each with 40 drawing tables, drawing boards for each student, and a blue-print room, with printing frame, wash trays, etc.

DEGREE COURSE IN MECHANICAL ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (English 81, 82)*.....	3	3
Trigonometry (Math. 11).....	3	
College Algebra (Math. 21).....	2	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100, 101).....	3	3
Mechanical Drawing (M. E. 151).....	2	
Descriptive Geometry (M. E. 152).....		3
Foundry (Ind. Arts 171).....	2	
Patternmaking (Ind. Arts 131).....		2
Library Practice (Libr. 1).....	½	
Hygiene (Phys. Ed. 19).....	½	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	½	½
	<hr/> 17½	<hr/> 17½
Sophomore Year		
Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Physics 101, 102).....	4	4
Mechanical Drawing (M. E. 153).....	3	
Mechanism (M. E. 204).....		3
Commercial Geography (Com. 200)*.....	3	
Principles of Economics (Com. 210)*.....		3
Blacksmithing (Ind. Arts 151).....	2	
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind. Arts 202).....		1
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	½	½
	<hr/> 17½	<hr/> 17½

* Upon approval of the Dean, students may substitute a Modern Language for English in the freshman year and for Commercial Geography and the Principles of Economics in the sophomore year.

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Elements of Thermodynamics (M. E. 319).....	3	
Thermodynamics (M. E. 320).....		3
Applied Mechanics Laboratory (Exp. E. 201).....	3	
Power and Hydraulic Laboratory (Exp. E. 202).....		3
Hydraulics (I. E. 103).....	2	
Machine Shop (Ind. Arts 203, 205).....	2	3
Machine Design (M. E. 205).....		4
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
	<hr/> 17	<hr/> 17
Senior Year		
Machine Design (M. E. 206).....	3	
Power Plant Engineering (M. E. 321).....	2	
Electrical Machinery (E. E. 403).....	3	
Power Plant Design (M. E. 323).....		3
Advanced Mechanics Laboratory (Exp. E. 203).....	3	
Advanced Power Laboratory (Exp. E. 204).....		3
Power Plant Engineering (M. E. 322).....		2
Heating and Ventilating (M. E. 331).....		3
Seminar (M. E. 351, 352).....	1	1
Elective	4	4
	<hr/> 16	<hr/> 16

The following list of elective subjects is offered merely as a suggestion. Many other courses are available, both in engineering and in other schools of the College.

First Semester	No. of Credits
Hydraulic Pumps and Motors (I. E. 203).....	3
Compressed Air and Refrigeration (M. E. 325).....	2
Internal Combustion Motors (M. E. 346).....	2
Reinforced Concrete (C. E. 557).....	3
Experimental Research Problems (Exp. E. 291).....	2
Engineering Chemistry (Chem. E. 301).....	3

Second Semester

Water Power (I. E. 204).....	3
Contracts and Specifications (H. E. 607).....	2
Experimental Research Problems (Exp. E. 293).....	2
Metallurgy of Iron and Steel (Met. 410).....	2
Internal Combustion Motors (M. E. 346).....	2
Excavation, Explosives, and Blasting (Min. E. 226)....	2

The following courses are offered:

151. Mechanical Drawing. The use of instruments and elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, principles of orthographic projection, etc., supplemented by recitations and lectures from a standard text.

As soon as practicable the copy sheets are discontinued and the student is required to make sketches and working drawings of typical machine details, such as pulleys, fly wheels, crank shafts, pump details, etc., from actual machines available in shops and drawing room. In addition, a special drill in free-hand lettering is given at the beginning of each period throughout the course.

Electrical Engineering, Mechanical Engineering; freshman year; Logging Engineering, sophomore year; first semester; 2 credits; 2 laboratory periods. Text: French, Engineering Drawing. Fee \$0.50.

152. Descriptive Geometry. This course consists of the graphic solution of problems involving the projection of lines, surfaces, and solids. Special effort is made to make the work as practical as possible and to make clear the application of Descriptive Geometry to actual drafting-room problems.

Chemical Engineering, Electrical Engineering, Mechanical Engineering, Mining Engineering; freshman year; second semester; 3 credits; 2 recitations; 2 two-hour laboratory periods. Text: Ferris, Elements of Descriptive Geometry.

153. Mechanical Drawing. A continuation of course 151 and includes laying out of gear-teeth curves and conventional methods of representing different kinds of gears. Exercises in structural-steel drafting are also given, as well as sheet-metal layouts of a large variety of intersections, joints, etc., from principles learned in Descriptive Geometry. The remainder of the semester is devoted to practical machine drafting of machines and apparatus to be built in the College Shops. All articles built in the Shops are

first detailed in the drawing room by the students from sketches and other data, and blueprints sent to pattern and machine shops. A number of standard sizes and a standard title are used, and every effort is made to have the work conform as closely as possible to good drafting-room practice.

Electrical Engineering and Mechanical Engineering; sophomore year; first semester; 3 credits; 3 laboratory periods. Text: French, Engineering Drawing. Fee \$0.50.

156. Mechanical Drawing. A course for second-year students in Industrial Arts. Similar to M. E. 153, except that the methods of teaching such a course are given more attention with a view of developing teachers for secondary schools.

Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods. Text: French, Engineering Drawing. Fee \$0.50.

161. Ship Drafting. This course will take up the consideration of problems ordinarily met with in drafting out designs of standard types of wood and steel vessels. It will include laying off and fairing a set of lines from given offsets, and preparation of the principal working structural plans such as midship section, deck plating, and bulk heads. Booms, masts, and fittings will be worked up in detail. Marine engines and boilers will be given consideration with a view of showing wherein they differ from the equipment of stationary power plants.

The course will be made as practical as possible by dealing only with what is considered best practice by leading builders and the specification writers of the Emergency Fleet Corporation. Students will be apprised of new developments in an earnest effort to cope with the necessities of the war emergency.

Prerequisite: M. E. 153. Elective either semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$0.50.

204. Mechanism. A study of mechanical movements, including velocity ratios; transmission of motion by linkwork, gearing, cams, and belting.

The course in Electrical and Mechanical Engineering; sophomore year; second semester; 3 credits; 2 recitations; 2 two-hours laboratory periods. The course in Logging Engineering; junior year; second semester; 3 credits; 2 recitations; 2 two-hours laboratory periods. Text: Keown, Elements of Mechanism. Fee \$0.50.

205. Machine Design. This course consists largely in applying the principles discussed in mechanism and in mechanics to the

design of machine parts. The work includes among other things the study of screws, fastenings, shafting, belting, fly wheels, wheels, gearing, and machine frames.

Junior year; second semester; 4 credits; 3 recitations; 1 laboratory period. Text: Kimball and Barr, Machine Designs.

206. Machine Design. This course supplements and is directly dependent upon the recitation work of course 125.

The work is taken up from a practical point of view and applies such theory as is consistent with the approved methods of design. Designs and complete working drawings are made of machines.

Senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Text: Kimball and Barr, Machine Designs.
Text: Kimball and Barr, Machine Designs.

207. Machine Drawing and Design. A course in mechanical drawing involving the elementary principles of machine design.

Industrial Arts course; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

251. Statics and Dynamics. This is essentially a course in theoretical and applied mechanics. Force systems are analyzed and their effects upon rigid bodies, both at rest and in motion, are carefully studied. Methods of finding centers of gravity and moments of inertia are investigated, and their practical application is brought to the student's attention by solving a number of problems. The principles of work, energy, friction, and impact, are all studied with reference to their importance in the field of engineering.

Prerequisites: Differential and Integral Calculus, Math. 51, 52. All courses in Engineering; junior year; first semester; 5 credits; 5 recitations. Text: Hancock, Applied Mechanics for Engineers.

252. Strength of Materials. In this course the general principles of mechanics are applied to the elements of engineering structures to determine their strength and fitness.

Some of the features are tensile and crushing strength of different engineering materials; strength and stiffness of beams or girders under different systems of loading, and various methods of support; supporting power of posts or columns; the application of torsion to shafts as a means of transmitting power.

The work throughout is exemplified by numerous problems which the student is required to solve.

Prerequisite: Statics and Dynamics, M. E. 251. All courses in Engineering; junior year; second semester; 3 credits; 3 recitations. Text: Boyd, Strength of Materials.

254. Elementary Mechanics. A study of some of the general principles and applications of mechanics without the use of the calculus. The relations of force, mass, and velocity are discussed with special reference to their application in finding stresses in framed structures, and cables. Work, energy, and power are also briefly considered.

The course in Logging Engineering; senior year; second semester; 3 credits; 3 recitations.

302. Road Machinery. This course is designed to familiarize the student with the purpose, care, and manipulation of the different forms of power-driven road machinery, both steam and gas, as exemplified in modern road construction.

The course in Highway Engineering; senior year; first semester; 1 credit; 1 laboratory period.

310. The Practice of Engineering and Design. The application of cost analysis to practical engineering problems. The design of power plants with special reference to economy of investment and operation, together with a study in the choice of size of units for given load variation for best plant efficiency, growth and load factors, contracts, specifications, and the purchase and sale of equipment according to best American practice.

Primarily for graduates. **Prerequisite:** Power Plant Design, M. E. 323, must be taken in conjunction unless credit therein has already been obtained. Elective senior year. Three credits; 2 drawing periods and 1 recitation; second semester.

317. Heat Engines and Boilers. An elementary course in the fundamentals of steam and gas engines, boilers and auxiliaries, together with the principles of combustion.

Course in Logging Engineering; junior year; first semester; 2 credits; 2 recitations. Text: Allen and Bursley, Heat Engines.

318. Heat Engines and Boilers. A more advanced course than 317, covering the elements of thermodynamics, of steam and gas engines, turbines, boilers and power plant auxiliaries, together with the principles of combustion.

Course in Electrical Engineering; junior year; first semester; 3 credits; 3 recitations. Text: Allen and Bursley, Heat Engines.

319. Elements of Thermodynamics. A thorough study of the thermodynamics of perfect gases, gas cycles, and combustion, together with a study of fuels, furnaces, draft apparatus, boilers and boiler auxiliaries, and steam generation.

Prerequisite: Diff. and Int. Calc. Math. 51 and 52. Course in Mechanical Engineering; junior year; first semester; 3 credits; 3 recitations.

320. Thermodynamics. A continuation of course 319. A thorough study of the thermodynamics of vapors, steam engine cycles, together with a study of steam and gas engines, turbines, compressors, engine valve gear, governors and auxiliaries.

Prerequisite: Elements of Thermodynamics, M. E. 319. Course in Mechanical Engineering; junior year; second semester; 3 credits; 3 recitations.

321. Power Plant Engineering. A study in the choice and coordination of power equipment and its assembly, of foundations and buildings, and the combination of power plant machinery with other equipment, together with elementary cost study.

Prerequisite: M. E. 319 and 320. Course in Mechanical Engineering; senior year; first semester; 2 credits; 2 recitations. Text: Handbook M. E., also Cambria.

322. Power Plant Engineering. A more thorough study of the assembly of power plant machinery, foundations and building, elevating and conveying machinery, water treating plants together with a more advanced study of cost analysis.

Prerequisite: M. E. 321. Course in Mechanical Engineering; senior year; second semester; 2 credits; 2 recitations. Text: M. E. Handbook, also Cambria.

323. Power Plant Design. The complete design and layout of power plants, elevating and conveying machinery, foundations and buildings, alone and in combination with other machinery, in accordance with best practice, and from blue prints of actual power plants machinery as built by the best American manufacturers.

Courses in Mechanical Engineering; second semester; 3 credits; 2 laboratory periods.

325. Compressed Air and Refrigeration. A course devoted to the theory, design, and operation of air compressors, fans, and blowers, the first part of the semester, and to the study of the theory and operation of commercial refrigeration systems the latter part.

Prerequisite: M. E. 305. Elective in the senior year of the Mechanical and Electrical Engineering courses; first semester; 2 credits; 2 recitations. **Text:** Thorkelson, Air Compression and Transmission.

331. Heating and Ventilating. Study of modern methods for the heating and ventilating of buildings. An outline of the work includes a study of several approved systems of heating by means of steam, hot water, or air; methods of computing radiating surface; effective methods of ventilation; general design; construction, and operation of plant.

The course in Mechanical Engineering; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods. **Text:** Hoffman, Heating and Ventilation.

346. Internal Combustion Engines. A study of gas cycles and the losses in the actual engines. Consideration of the various types of engines and their adaptation in practice together with a close study of the value of the internal combustion engines as power producers, as compared with other prime movers.

Elective; senior year; either semester; 2 credits; 2 recitations. **Text:** Streeter, Internal Combustion Motors.

351. Seminar. The seminar meets once each week to study progress and development in the field of mechanical engineering. Technical literature will be reviewed; assignments will be made in advance, covering new or special features of engineering work. Students are required to submit carefully prepared reports, criticisms, or comments.

The course in Mechanical Engineering; senior year; first semester; 1 credit; 1 recitation.

352. Seminar. A continuation of course 351.

The course in Mechanical Engineering; senior year; second semester; 1 credit; 1 recitation.

A-1. Vocational Drawing. Similar to M. E. 151 except more stress is laid on the elementary principles, as the course is designed for students who have had no high-school training in drawing.

Vocational course; Mechanic Arts; first year; first semester; 2 credits; 2 laboratory periods. Fee \$0.50.

B-1. Vocational Drawing. A continuation of A-1.

Vocational course; Mechanic Arts; first year; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

A-2. Vocational Drawing. Continuation of B-1. As the student becomes competent he is given practical machine drafting on work through the shops, similar to that of M. E. 153.

First semester; 2 credits; 2 laboratory periods. Fee \$0.50.

B-2. Vocational Drawing. Continuation of A-2.

Second year; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

A-3. Vocational Drawing. Continuation of B-2.

Third year; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

B-3. Vocational Drawing. Continuation of A-3.

Third year; first semester; 2 credits; 2 laboratory periods. Fee \$0.50.

SCHOOL OF FORESTRY

GEORGE WILCOX PEAVY, Dean.

*JOHN POMEROY VAN ORSDEL, Professor of Logging Engineering.

HAROLD STEPHENSON NEWINS, Associate Professor of Forestry.
Instructor in Forestry.

ALUMNI ADVISORY COMMITTEE

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Oregon is the foremost timber state in the Union. Of the standing timber remaining uncut in the United States fully twenty percent is within the boundaries of the State of Oregon. According to the best available estimates, this stumpage aggregates approximately 538 billion feet, board measure. Over 11 million acres of timber land, carrying 404 billion board feet of timber are privately owned and 13 million acres, carrying 134 billion board feet, are in the National Forests. The timber in private hands is being cut as the interest of the owners direct. That in public ownership is being sold according to the requirements of the local markets. All National Forest timber is for sale.

This dual ownership of timber opens up two fields. The first is distinctly that of harvesting an immense crop of mature timber. Under the present system of taxation and with the prevailing rates of interest, private enterprise cannot profitably grow timber. The interest of the private owner is largely at an end with the removal of the standing timber. The work of harvesting the timber crop is the sphere of the logging engineer. The domain within the National Forests is dedicated to the production of timber for all time. It is the policy of the Forest Service to restock the cutover areas and to plant all denuded areas which are capable of growing timber. The planting, growing, and protecting of timber crops is the special field of the technical forester.

The Profession of Logging Engineering. The profession of logging engineering is of recent development. In the past, low prices for standing timber, easy logging, and high prices for lumber have made profits to the lumberman sure, and these same conditions have not demanded economy in operation. With high-priced stumpage, timber difficult of access, and low prices for lumber,

* On leave for the year 1918-19.

a revolution in the entire lumber industry is being forced. It has become a case of economy in operation or financial failure. Bringing the logs over rough country to the mill involves many engineering problems. Among these are the construction of logging railroads, the installation of efficient sky-line and ground logging devices, and the operation of special steam and electrical logging equipment. The course in Logging Engineering is designed to equip young men to be of use in this field. The course as outlined in this catalogue was prepared under the direction of some of the ablest timbermen in the Pacific Northwest, and the strictly technical subjects in the course are taught by one of the foremost logging engineers in the United States.

Advantages of the West. The forests of the United States are in the West. In this region the student of forestry is in immediate contact with the conditions he is studying. Oregon alone has 24 million acres of forest land. The greater part of this acreage is west of the Cascade Mountains and consequently easily accessible from the College at Corvallis. Thus, an immense laboratory for observation and field work is at the very doors of the School of Forestry. In the spring of each college year students in both forestry and logging engineering go out on some timber tract for a period of two weeks of practical field work. The men are divided into small crews and an area of several thousand acres of timber is carefully surveyed, cruised, and mapped under the supervision of experienced men. Advanced students make special trips for the purpose of studying the various types of logging and milling operations. Some of the largest sawmills in the world are but two hours travel from the College. Pulp mills, wood distillation plants, box and furniture factories are easily accessible. In addition to this, summer work in the forests or in logging camps is easy to obtain, and is expected of all forestry and logging students. All this points to the fact that Oregon is the ideal place to study general forestry and logging engineering.

Forestry work in this country is yet in its infancy; but it is developing rapidly. When the full economic importance of our forest resources is understood, more intensive methods will be required and many times the number of men now employed will be needed. The Forest Service is steadily raising the requirements for admission to its ranks. Nontechnical men who cannot meet the new requirements are naturally retired. The field for the technically trained man is consequently becoming broader. The

State, too, is feeling the need of trained men in forest-protection work. As time goes on this field will be more extensive.

The work in both branches of forestry, that is, in general forestry and in logging engineering, is in charge of technically trained men, all of whom have had practical experience in their respective lines of work. In neither course, however, are technical subjects permitted to crowd out other subjects requisite in an education. The logging engineer and the forester are prepared for citizenship by courses in sociology, political economy, state and local government, tax and labor problems, and other kindred subjects. The fact that the professional man should be prepared for leadership in his community, as well as for success in his chosen work, is always kept clearly in view.

To give those students who so desire an opportunity to secure a broader foundation in subjects basic to logging engineering, as well as to provide time for cultural work and advanced professional training, a five-years course in logging engineering is offered for the first time.

Equipment. The School of Forestry is now provided with suitable space in which to do its work. A three story building, eighty feet wide and one hundred and thirty-six feet long, has been constructed to house the work of the school. This building contains roomy laboratories for work in silviculture, dendrology, mensuration, forest protection, timber technology, drafting, timber grading, and logging devices and equipment. Through the kindness of the manufacturers of logging equipment and lumber manufacturing concerns, much valuable material has been assembled for demonstration purposes.

In addition to the laboratories, class rooms, and offices, space is devoted to a collection of manufactured wood products, designed to show the various uses to which wood may be put, and to educate students in the proper utilization of Oregon's greatest natural resource. All available publications dealing with general forestry, logging, or lumber manufacture are provided for the use of students.

The Forest Club. This is an association of students and instructors "formed for the purpose of promoting the forestry interests of the State." In order to carry out its purposes, it meets twice each month. The first meeting of each month is purely of a social nature, with each alternate meeting for the discussion of current forestry literature, magazine articles, news

items, legislation, and general progress movements pertaining to forests, forest service, forest products, forest industries, lumbering, and the lumber trade.

DEGREE COURSE IN GENERAL FORESTRY

The following subjects are recommended for students who desire to work for a degree in general forestry. For graduation the College requires the student to complete 136 credit hours. Of this number he is expected to take 60 hours of professional work, 25 hours of science, and 6 hours in mathematics. The balance of the required 136 hours may be made up of subjects outlined in the recommended course or of those approved by the Dean of the School. Only in exceptional cases will the outlines for the freshman and sophomore years be modified.

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 85, 86).....	2	2
Trigonometry (Math. 14).....	3	
Elementary Analysis (Math. 34).....		3
General Forestry (For. 101, 102).....	3	2
Elementary Mensuration (For. 304).....		3
Plane Surveying (C. E. 234).....		3
General Chemistry (Chem. 100, 101).....	3	3
Forest Geology (Min. 161).....	3	
Library Practice (Libr. 1).....	1½	
Hygiene (Phys. Ed. 19).....	1½	
Gymnasium (Phys. Ed. 15, 16).....	1½	1½
Drill (Military 1,2).....	1	1
First Aid (Phys. Ed. 23).....	1	
	<hr/> 17½	<hr/> 17½

	Semester	
	1st	2nd
Sophomore Year		
Blacksmithing (Ind. Arts. 151).....		2
General Physics (Phys. 1, 2).....	3	3
Mensuration (For. 305).....	3	
Topographic Surveying (C. E. 235).....	3	
Silviculture (For. 201, 202).....	3	3
Forest Botany (Bot. 30, 31).....	3	3
Forest Protection (For. 505).....		3
Elementary Forest Mapping (For. 303).....		2
Gymnasium (Phys. Ed. 17, 18).....	½	½
Drill (Military 3, 4).....	1	1
	<hr/>	<hr/>
	16½	17½

Junior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Mensuration (For. 301).....	5	
Log Scaling (For. 307).....		2
Identification of Woods (For. 508).....		3
Forest Entomology (Ento. 304).....		3
Advanced Silviculture (For. 203, 204).....	3	2
Elementary Economics (Com. 210).....	3	
Forest History and Economics (For. 103).....		3
Uses of Wood (For. 507).....	2	
Military Science (Theo. Inst. 1, 2).....	1	1
Military Drill (Military 5, 6).....	1	1
	<hr/>	<hr/>
	18	18

Senior Year		
Forest Finance (For. 401).....		4
Economics of Lumber Industry (For. 403).....	4	
Dendrology (For. 501).....	5	
Lumbering Management (For. 407).....		4
Forest Improvement (For. 405).....	3	
Timber Technology (For. 502).....		4
Timber Testing (Exp. E. 238).....		1
Forest Appraisals and Reports (For. 306).....	3	
Seminar (For. 408, 409).....	1	1

Suggested Electives	Semester	
	1st	2nd
Dendrology (For. 503).....		3
Forest Pathology (Bot. 37).....		1
Economic Zoology (Zool. 108, 109).....	3	3
Labor Problems (Com. 213).....		3
Range and Pasture Botany (Bot. 36).....	3	

DEGREE COURSE IN LOGGING ENGINEERING

(Four-Years Course)

The following subjects are recommended for those students in logging engineering who desire to devote the customary four years to their college course. For graduation the College requires the student to complete 136 credit hours. Of this number he is expected to complete 60 hours in professional work, 10 hours in general science, 10 hours in mathematics, and the balance of the required 136 hours in the general subjects as outlined or as approved by the Dean of the School. Only in exceptional cases will the outlines for the freshman and sophomore years be modified.

Freshman Year	Semester	
	1st	2nd
Modern English Prose (Eng. 85, 86).....	2	2
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31).....		5
Chemistry (Chem. 100).....	3	
General Forestry (For. 101, 102).....	3	2
Plane Surveying (C. E. 234).....		3
Elementary Mensuration (For. 304).....		3
Wood Working (Ind. Arts 110, 111).....	2	2
Library Practice (Libr. 1).....	½	
Hygiene (Phys. Ed. 19).....	½	
Gymnasium (Phys. Ed. 15, 16).....	½	½
Drill (Military 1, 2).....	1	1
	<hr/>	<hr/>
	17½	18½

	Semester	
	1st	2nd
Sophomore Year		
Engineering Physics (Phys. 101, 102).....	4	4
Topographic Surveying (C. E. 235).....	3	
Mensuration (For. 305).....	3	
Blacksmithing (Ind. Arts 151).....		2
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind. Arts 202).....		1
Railroad Surveying (C. E. 274).....		4
Silvics (For. 205).....	3	
Tree Identification (For. 206).....		4
Principles of Economics (Com. 210).....	3	
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Junior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Adv. Mensuration (For. 301).....	5	
Log Scaling (For. 307).....		2
Advanced Forest Mapping (For. 317).....	2	
Logging Machine Design (For. 316).....		2
Efficiency Systems (For. 313).....		2
Timber Technology (For. 502).....		4
Timber Testing (Exp. E. 238).....		1
Heat Engines and Boilers (M. E. 317).....	2	
Steam Laboratory (Exp. E. 255).....	1	
Uses of Wood (For. 507).....	2	
Identification of Woods (For. 508).....		2
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
	<hr/> 17	<hr/> 18

	Senior Year	Semester	
		1st	2nd
Economics of Lumber Industry (For. 403).....		4	
Forest Finance (For. 401).....			4
Topographic Logging Plans (For. 308).....		4	
Logging Devices and Equipment (For. 604, 605).....		4	4
Lumbering Management (For. 407).....			4
Logging Railroads (For. 601).....		4	
Logging Methods (For. 315).....			2
Forest Appraisals and Reports (For. 306).....		3	
Mechanics (M. E. 254).....			3
		19	17

DEGREE COURSE IN LOGGING ENGINEERING (Five-Years Course)

Due to the complex character of the work demanded of the logging engineer, and to the desire on the part of many of those who are preparing for the profession for a broader training both in fundamental and general cultural subjects, a five-years course leading to the degree of Logging Engineer is offered for the first time. Students who complete the first four years of this course will receive the degree of Bachelor of Science in Logging Engineering. Those who complete the full five-years course, and who receive the recommendation of the Dean of the School and the head of the department of Logging Engineering, will be granted the graduate degree of Logging Engineer.

	Freshman Year	Semester	
		1st	2nd
Modern English Prose (Eng. 85, 86).....		2	2
Trigonometry, College Algebra (Math. 11, 21).....		5	
Elementary Analysis (Math. 31).....			5
General Chemistry (Chem. 100).....		3	
General Forestry (For. 101, 102).....		3	2
Plane Surveying (C. E. 234).....			3
Elementary Mensuration (For. 304).....			3
Wood Working (Ind. Arts 110, 111).....		2	2
Library Practice (Libr. 1).....		$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....		$\frac{1}{2}$	
Drill (Military 1, 2).....		1	1
Gymnasium (Phys. Ed. 15, 16).....		$\frac{1}{2}$	$\frac{1}{2}$
		17 $\frac{1}{2}$	18 $\frac{1}{2}$

	Semester	
	1st	2nd
Sophomore Year		
Differential Calculus (Math. 51).....	4	
Engineering Physics (Phys. 101, 102).....	4	4
Blacksmithing (Ind. Arts 151).....		2
Topographic Surveying (C. E. 235).....	3	
Mensuration (For. 305).....	3	
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind. Arts 202).....		1
Railroad Surveying (C. E. 274).....		4
Silvics (For. 205).....	3	
Tree Identification (For. 206).....		4
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 18½	<hr/> 17½

Junior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Principles of Economics (Com. 210).....	3	
Advanced Mensuration (For. 301).....	5	
Log Scaling (For. 307).....		2
Adv. Forest Mapping (For. 317, 318).....	2	2
Logging Machine Design (For. 316).....		2
Uses of Wood (For. 507).....	2	
Identification of Woods (For. 508).....		2
First Aid (Phys. Ed. 24).....		1
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Mil. 5, 6).....	1	1
Elective		3
	<hr/> 17	<hr/> 17

	Semester	
	1st	2nd
Senior Year		
Advanced Commercial Law (Com. 309).....	3	
Cost Accounting (Com. 150).....	3	
Economics of Lumber Industry (For. 403).....	4	
Forest Finance (For. 401).....		4
Elementary Mechanics (M. E. 254).....		3
Heat Engines and Boilers (M. E. 317).....	2	
Steam Laboratory (Exp. Eng. 255).....	2	
Elements of Electrical Machines (E. E. 403, 406).....	3	3
Efficiency Systems (For. 313).....		2
Timber Technology (For. 502).....		4
Timber Testing (Exp. Eng. 238).....		1
	—	—
	17	17

Graduate Year

Logging Railroads (For. 601).....	4	
Advanced Logging Railroads (For. 606).....		4
Topographic Logging Plans (For. 308).....	4	
Logging Devices and Equipment (For. 604, 605).....	4	4
Lumbering Management (For. 407).....		4
Lumber Manufacture (For. 602).....	2	
Logging Methods (For. 315).....		2
Forest Appraisals and Reports (For. 306).....	3	
Special Problems		2
	—	—
	17	16

Suggested Electives

Forest Mapping (For. 303).....	2	
Commercial Lectures (For. 411).....	1	
Labor Problems (Com. 213).....		3
Forest Protection (For. 505).....		3

SUGGESTED SHORT COURSE SUBJECTS

Forest Protection (For. A, B).....	3	3
Forest Measurements (For. C, D).....	3	3
Forest Surveying and Mapping (For. E, F).....	3	3
Forest Improvements (For. G, H).....	3	3
Forest Administration (For. K, L).....	1	1
	—	—
	13	13

The following courses are offered:

101. General Forestry. The responsibility of the nation in the conservation of its natural resources. The vital interest of the nation in its timber, coal, iron, water, etc. Appropriate methods of insuring longest and best use of these natural resources.

Forestry; freshman year; first semester; 3 credits; 3 lectures; 3 recitations. Reference text: Van Hise, Conservation of Natural Resources.

102. General Forestry. Preliminary survey of the whole field of forestry. Forest regions of the United States and the commercial trees native to those regions. Forest ownership, private, state, and national. Elements of state and national forest policy. Economic importance of the forests of the state and nation.

Forestry; freshman year; second semester; 2 credits; 2 lectures; 2 recitations. Reference text: Moon and Brown, Elements of Forestry.

103. Forest History and Economics. The development of European forestry. Progress of American forestry. The economic importance of forest products. Transportations as affecting the lumber industry.

Forestry; junior year; second semester; 3 credits; 3 lectures; 3 recitations. Reference text: Fernow, Economics of Forestry.

201. Silviculture. The art of establishing, developing, and reproducing trees, including their life-history, influences, modification, and growth. Forest description, covering general problems. Silviculture systems of cutting, such as, selection, clear cutting, and coppice. Marking trees for various cuttings. Silvicultural management.

Forestry; sophomore year; first semester; 3 credits; 1 lecture period of three hours; 1 field period of three hours. Reference text: Graves, Handling of Woodlands. Fee \$1.50.

202. Silviculture. The improvement of woodlands; clearings; thinnings; damage cuttings. Protection as related to silviculture. Forestation, including seed production, seed collection, seed preservation, and seed testing. Natural versus artificial regeneration. Nursery Practice. Planting. Afforestation.

Prerequisite: Forestry 201. Forestry; sophomore year; second semester; 3 credits; 2 lectures; 1 field period of three hours. Reference text: Graves, Handling of Woodlands. Fee \$1.50.

203. Advanced Silviculture. The practice of forestry in each silvicultural region of the United States, including study of physiography, management, protection, types, silvical characteristics of important species, and market relations. Forest ecology, dealing with the reciprocal relations between trees and forests and their environment, including a study of types and their classification, forest formations, climatic characteristics, soils investigations, antecology, sinecology, and ecological experiments.

Prerequisite: Forestry 201 and 202. Forestry; junior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.50.

204. Advanced Silviculture. Silvics, including the measure of tolerance, study of sample plots, economic possibilities of species, and reproduction characteristics. Each student will be required to make a detailed silvical study of some definite forest tract and present a thesis covering the work.

Prerequisites: Forestry 201, 202, and 203. Forestry; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.50.

205. Silvics. Influence of the forest on stream flow and climate. Geographical and local distribution of trees by species. Tree reproduction. Tolerance. The relationship between trees and their environment.

Logging Engineering; sophomore year; first semester; 3 credits; 2 lectures; 1 field period. Fee \$1.50.

206. Tree Identification. Field characteristics and classification of timber trees of United States, their commercial range, local occurrence, size, growth, form, climatic soil and moisture requirements, resistance, relative tolerance and reproduction. The fundamental purpose of this course is to teach the student to know commercial timber trees.

Logging Engineering; sophomore year; second semester; 4 credits; 3 lectures; 1 field period. Reference text: Sudworth, Trees of the Pacific Slope. Fee \$1.50.

301. Advanced Mensuration. Log rules. Scaling of logs in board feet. Cord measure. Amount of timber required to make 1000 shingles. Shingle bolts, and units of measures used by all by-products. Piling specifications and values compared with other products. Making of volume tables and form factor tables for timber estimating purposes. Growth studies. Volume growth per-

cent. Yield tables. Complete valuation surveys including application of methods learned in connection with forest appraisals in course 304 and 305 to areas of timber land. Comparison between values derived in logging and mill cuts and estimates of standing timber. Field work at the mills and in the woods. Each student is required to assist in making a complete valuation survey and in preparing a complete report on a given piece of timber. Advanced work in the execution of topographic surveys on timbered areas. Costs of such work.

Prerequisites: For. 304 and 305, C. E. 234 and 235. General Forestry and Logging Engineering; junior year; first semester; 5 credits; 3 recitations; 2 field periods of three hours each. Reference text: Graves, Forest Mensuration. Fee \$2.00.

303. Forest Mapping. Drill in the detail of Forest mapping. Forest Service plain lettering and conventional signs. Use of contour and road pens, ruling pen, cross section liner, pantograph, and lettering gauges. Crayon and ink coloring in Forest Service and other standard legend. Making of final reconnaissance and land classification maps.

Forestry; elective; freshman year, second semester; sophomore year, first semester; 2 credits; 2 laboratory periods. Fee \$2.00.

304. Elementary Mensuration. Use of instruments employed in cruising timber; aneroid and barograph, box compass, jacob staff compass, Locke hand level, Abney hand level, Forest Service topographic hand level, trail tapes, etc. Cavalry sketching board. Principles and practice of pacing. Standardizing pace to all kinds of ground. Methods of covering ground in making timber appraisals, both in Forest Service and commercial timber holdings. History and theory of surveying public lands. Federal rectangular survey system. Private land grant boundary. Donation land claims. This last to be confined to a foundation on which the field work will be built. British Columbia land laws and methods of surveys. Mexican land grants. South American land laws and grants.

General Forestry and Logging Engineering; second semester; 3 credits; 2 recitations; 1 three-hours field period. Text: U. S. Manual of Public Land Surveys. Fee \$2.00.

305. Mensuration. The use of Forest Service and other hypsometers, Biltmore stick, Forest Service cruisers' sticks, calipers, diameter tape. Methods of estimating and measuring heights

and diameters of trees without special instruments. Topographic surveying of forested areas. Keeping field notes. Approved methods of traversing. Practice in surveying with aneroid barometer with the use of barograph as a checking instrument. Combination of methods. Execution of public land surveys. Retracing surveyed lines. Section subdivisions. Re-establishing obliterated corners. British Columbia, Mexican and South American surveys. Photographic surveys. Costs.

Prerequisites: For. 304 and C. E. 234. General Forestry and Logging Engineering; sophomore year; first semester; 3 credits; 1 recitation; 2 three-hours field or laboratory periods. Fee \$2.00.

306. Forest Appraisals and Reports. Commercial timber land examinations as made by commercial cruising companies. Cruising methods required by bonding companies, bankers, purchasers and operators. Preparation of the report which should cover such examinations. The various cruising methods and their relative merits. In this course the student will be required to work out and report on a problem which will be of practical value to some logging concern.

Prerequisite: For. 301. Logging Engineering; senior year; first semester; 3 credits; 2 lectures; 1 field or laboratory period of three hours. Fee \$3.00.

307. Log Scaling. Log Scaling as practiced in the United States generally and in the Pacific Northwest and in British Columbia in particular. The theory of board measure and the merits and demerits of the different scale rules. Allowances for log defect. The keeping of records. Scaling with reference to log grades as practiced on the Pacific Coast in different kinds of timber. Rules governing the sale of logs in different districts. Rules of log scaling and grading bureaus. Students will be required to scale at mills and logging camps. Laws governing scaling.

Prerequisites: Forestry 304 and 305. General Forestry and Logging Engineering; junior year; second semester; 2 credits; 1 lecture; 1 field period of three hours. Fee \$1.50.

308. Topographic Logging Plans. Plans for logging operations. Students will be required to make a topographic map of a timbered area. The timber will be cruised and a complete set of plans worked out, showing the proper location of the main line logging railroads, railroad spurs, rollways or landings, pole roads,

swing settings, logging area lines. An estimate will be made of the cost of logging the tract.

Prerequisites: For. 301 and C. E. 235. Logging Engineering; graduate year; first semester; 4 credits; 2 recitations; 2 field periods of three hours each. Fee \$4.00.

313. Efficiency Systems. General discussions of efficiency systems. Special application to the lumber industry. Cost-keeping systems and their comparative values. Organization. Cost keeping versus bookkeeping. Bonus, merit, profit-sharing, and piece systems. Labor problems as applied to the logging industry. Present-day labor management as practiced in modern logging operations.

Logging Engineering; senior year; second semester; 2 credits; 2 lectures.

315. Logging Methods. The yarding, skidding, and loading of logs by all known methods. Falling and bucking of timber. The relative merits of various methods will be considered. All known methods of handling timber from the standing tree to the mill will be discussed, not only with regard to Northwestern methods but methods used all over the United States and Canada.

Logging Engineering; graduate year; second semester; 2 credits; 2 lectures.

316. Logging Machine Design. Designing logging equipment, tools and rigging. Instruction in the preparation of working plans for machine shop and foundry construction. Students will make a set of drawings of standard woods tools and railroad equipment which are constructed in mill and camp shops.

Prerequisite: For. 317. Logging Engineering; junior year; second semester; 2 credits; 2 laboratory periods of three hours each. Fee \$2.00.

317. Advanced Forest Mapping. A course in the method and construction of relief maps made from topographical data obtained by each student in the field; a study of their use in planning logging operations and value of the same for such purposes. Costs of constructing relief maps. Free-hand field sketching. Drill in lettering and finishing maps.

Prerequisites: For. 301 and 303. Logging Engineering; junior year; first semester; 2 credits; 1 laboratory period; 1 field period of three hours each. Fee \$2.00.

318. Advanced Forest Mapping. A continuation of course 317.

Logging Engineering; junior year; second semester; 2 credits; 1 laboratory period; 1 field period. Fee \$2.00.

401. Forest Finance. Investments and costs in forest production. The value of forest property for destructive lumbering. Value of forest property for continued timber production. Appraisal of damages due to the destruction of forest property. Forest taxation. Stumpage values. Comparison of forest values with agricultural values.

Forestry; senior year; first semester; 4 credits; 4 lectures; 4 recitations. Reference text: Chapman, Forest Valuation.

403. Economics of the Lumber Industry. A brief history of lumbering in the United States. Stumpage prices. Prices of manufactured lumber. Shifting centers of production. Transportation. Freight rates. The Inter-State Commerce Commission and the lumber industry. Substitutes and their effects. Lumbermen's Associations. Present rate of consumption and the future supply. Function of the government in the future of the industry.

General Forestry and Logging Engineering; senior year; first semester; 4 credits; 4 lectures.

405. Forest Improvements. A study of the planning, construction, and maintenance of the permanent improvements essential to the protection, administration, and use of a forest. Also the keeping of cost data for future estimating and supervision. Transportation improvements: roads, trails, bridges, and signposts. Communication improvements: telephones, heliographs, wireless. Protective improvements: lookout stations; fire lines, tool caches. Quarters improvements: houses, cabins, barns, sheds, fences, water supply, drainage systems.

Forestry; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

406. Field Work. This course is based upon practical work performed by the student between the sophomore and junior years or between the junior and senior years. The work must be done on some modern logging operation or in connection with some technical forestry work carried on by the State or by the Forest Service. A report based upon an approved outline must be submitted.

Forestry; junior or senior year; from 1 to 5 credits.

407. Lumbering Management. A series of lectures dealing with the lumber industry from the manager's standpoint. Trade, selling grades, and utility will be considered. Major accounting of interest to the manager. Lumber associations, bonds, taxation. Lumber rates and tariffs. Rate zones, control by Inter-State Commerce Commission. Rates by rail and water. Low towage.

Logging Engineering; graduate year; second semester; 4 credits; 4 lectures.

408. Seminar. Preparation and discussion of reports of special subjects. Current forestry and lumbering literature. Each student is required to prepare a report on some assigned subject.

Forestry; senior year; first semester; 1 credit.

409. Seminar. Continuation of course 408.

Forestry; senior year; second semester; 1 credit.

411. Commercial Lectures. A series of lectures by men engaged in the various phases of the lumber industry.

Forestry; elective; junior and senior years; second semester; 1 credit; 1 lecture period.

501. Dendrology. Classification and identification of forest trees, including a study of forest ecology and taxonomy. The silvical characteristics of commercial species. Life-history and requirements of trees.

Forestry; senior year; first semester; 5 credits; 3 recitations; 2 laboratory periods. Reference texts: Sudworth, *Trees of the Pacific Slope*. Sargent, *Trees of North America*. Fee \$2.00.

502. Timber Technology. Fundamental principles underlying the seasoning and kiln drying of woods. Kiln-drying methods and their relative merits. Preservative treatment of timber, methods and results. Manufacture of wood pulp. Production of fiber products. Manufacture of alcohol, turpentine, resin, tar, and other chemical products from wood. Closer utilization of wood waste. Grading rules for the various kinds of manufactured wood products.

General Forestry and Logging Engineering; senior year; second semester; 4 credits; 2 lectures; 2 laboratory periods. Fee \$3.00.

503. Advanced Dendrology. A continuation of course 501.

Forestry; senior year; elective; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.50.

505. Forest Protection. Protecting the forests from fire, insects and fungi. The course deals primarily with protection from

fire, laying emphasis on preventive methods such as sentiment making; laws, both state and federal; patrol; and the reduction of risk by slash disposal; fire lines; grazing, etc. Planning an adequate fire-fighting system in all its scientific phases. The business of fire fighting, including discovery, communication, transportation to fire, equipment, organization and work done. Federal, state, and private fire-control organizations.

Forestry; sophomore year; second semester; 3 credits; 3 recitations. Fee \$1.00.

506. Commercial Woods. The course is designed primarily to meet the requirements of the woodworker in choosing the species of wood best adapted to his needs, and in identifying the wood commonly used. Macroscopic and microscopic identification of different species. Dendrology and its significance in wood technology. Taxonomy, showing how trees are classed.

Industrial Arts; junior year; first semester; 2 credits; 1 lecture; 1 laboratory or field period. Reference texts: Noyes, Wood and Forest. Kellogg, Lumber and Its Uses. Fee \$2.00.

507. Uses of Wood. Study of wood structure and the adaptation of the wood to commercial uses. The chief wood-using industries and the relative amounts of the principal commercial species used annually. Adaptation of wood to special purposes. The substitutes for wood. Minor uses of wood such as pulp, fiber board, etc. By-products.

General Forestry and Logging Engineering; junior year; first semester; 2 credits; 1 lecture; 1 laboratory period. Reference text: Kellogg, Lumber and Its Uses. Fee \$2.00.

508. Identification of Wood. Identification of all the important commercial woods. Special emphasis is placed on the woods of the Pacific Northwest. Physical and structural properties. All woods in the vicinity of the School are collected during field trips and later prepared in the laboratory for microscopic examination. At the conclusion of the course a key to the identification of these woods is required.

Logging Engineering; junior year; second semester; 2 credits; 1 lecture; 1 field or laboratory period. Reference text: Record, Economic Woods. Fee \$2.00.

601. Logging Railroads. Railroads especially adapted to logging operations. Difference between logging railroads and common-carrier railroads. Grades. Alignment. Railroad operation as applied to the logging railroads. Economic theory of location and

construction. Structures and materials used in logging railroads. Costs of surveys, construction, operation and maintenance.

Prerequisite: C. E. 274. Logging Engineering; graduate year; first semester; 4 credits; 2 lectures; 1 field and 1 laboratory period of three hours each. Reference text: Welbroughton, Economic Theory of Railway Location. Fee \$4.00.

602. Lumber Manufacture. Discussion of the various types of modern mills. Manufacture of secondary products. Electrical versus steam mills. Lumber handling devices. Examinations of up-to-date mills and reports on them will be made.

Logging Engineering; graduate year; first semester; 2 credits; 1 lecture; 1 laboratory period.

604. Logging Devices and Equipment. Flume and chute construction. Rigging. Types of railroad locomotives, logging cars and trucks. Donkey engines. Skidding and loading devices. Camp buildings, shops, dwellings. Machine shop machinery and tools. Woods tools. Railroad track equipment and fixtures. Oil, grease, packing and waste. Water supply systems. Explosives. Construction equipment. Boilers, aerial tramways, snubbing devices. Incline railroads.

Logging Engineering; graduate year; first semester; 4 credits; 2 lectures; 2 laboratory periods of three hours each. Fee \$4.00.

605. Logging Devices and Equipment. A continuation of course 604. Blocks and hooks, log flumes, wire rope, logging dams, electrical machines used in logging. Detailed investigation of costs and makes of equipment. Aerial and high lead systems. Economic value of using efficient equipment.

Logging Engineering; graduate year; second semester; 4 credits; 2 lectures; 2 laboratory periods of three hours each. Fee \$4.00.

606. Advanced Logging Railroads. A continuation of course 601. Bridge and tunnel construction. Economics of construction and railroad operation. Economics of railroad motive power, rolling stock and other materials. Railroad management and financing.

Prerequisite: For. 601. Logging Engineering; graduate year; second semester; 4 credits; 3 lectures; 1 laboratory period. Fee \$4.00.

SHORT COURSE SUBJECTS IN GENERAL FORESTRY

A. Forest Protection. Causes of forest fires. The methods of controlling forest fires. The proper organization of fire patrol over definite areas. Fire fighting devices. Lookout stations, telephone lines, roads and trails, with reference to fire control. Different methods applicable to different regions.

Forester's Short Course; first semester; 3 credits; 3 recitations.

B. Forest Protection. A continuation of course A.

Forester's Short Course; second semester; 3 credits; 3 recitations.

C. Forest Measurements. The fundamental principles involved in computing the solid contents of logs and trees. Method of construction scale rules. Height measures. Forest Service methods of cruising timber. Other methods. Discounts for defects. Volume tables. Practical demonstrations in the woods.

Forester's Short Course; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

D. Forest Measurements. A continuation of course C.

Forester's Short Course; second semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

E. Forest Surveying and Mapping. A study of the United States system of land surveys. Retracing surveyed lines. Methods employed in marking surveyed lines. The use of the compass; the surveyor's chain; plane table, Abney hand level. Practical field work in surveying. The use of the aneroid barometer in topographic surveying. The details of map making. Conventional signs used in mapping.

Forester's Short Course; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

F. Forest Surveying and Mapping. A continuation of course E.

Forester's Short Course; second semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

G. Forest Improvements. The construction of roads, trails, telephone lines, lookout stations, bridges, cabins, etc., costs.

Forester's Short Course; first semester; 3 credits; 2 recitations; 1 laboratory period.

H. Forest Improvements. A continuation of course G.

Forester's Short Course; second semester; 3 credits; 2 recitations; 1 laboratory period.

K. Forest Administration. The organization of the Federal Forest Service. The District Office. The National Forest. The State Forester's office. Organization of the State work. Forms used in the transaction of forest business. The preparation of reports.

Forester's Short Course; first semester; 1 credit; 1 recitation.

L. Forest Administration. A continuation of course K.

SCHOOL OF HOME ECONOMICS

AVA BERTHA MILAM, Dean

The School of Home Economics offers the following courses of study: a graduate course leading to the degree of Master of Science, with majors in the departments of Household Science, Household Art, House Administration, Institutional Management, Applied Design, and Education; three four-years courses, each of which leads to the degree of Bachelor of Science; a two-years course for dietitians; a one-year homemaker's course; elective courses for students in other schools of the College; a four-weeks course in food studies, dressmaking, textiles, etc., which is offered in connection with the Winter Short Course; and a six-weeks course for teachers, offered in connection with the work of the Summer School.

Fundamentally, the young women in the School of Home Economics are offered such training as will help them to be prepared to adjust themselves readily to their environment. That the young women completing this work may be good citizens as well as good homemakers, good business managers in their homes, as well as good cooks, broadly educated women, as well as specially trained workers, the courses of study in the School of Home Economics have been planned to give a liberal as well as a technical education.

Opportunities for teaching Home Economics, not only in high schools and colleges, but as supervisors in the common schools of cities, and in the consolidated community schools of progressive rural communities, are becoming more general and more desirable. Facilities for specializing in this work at the College are therefore given special attention. Many opportunities are open to the women capable of solving the problems of good food service for large numbers of people, and for experts in the management of large institutions. Equally attractive opportunities are available for the expert needlewoman, the tasteful designer of gowns, the competent dressmaker or milliner, the ladies' tailor, and the woman with artistic resources as a household decorator and furnisher.

More and more the life of the modern community is dependent upon institutions. Women are rapidly taking their places as executive and administrative leaders in the important functions of these institutions. Hospitals, Institutional Homes, Educational

Institutions, and Social Centers, are increasingly demanding the services of women of skilled technical accomplishments. There is a growing demand for dietitians in hospitals and large institutions, in the Red Cross service, and as managers of cafeterias and tea rooms. The training in dietetics, catering, and management offered the young women at the College through the School of Home Economics, assists in the liberal and practical preparation for this employment. The textile and clothing courses, together with art and science training, give a good foundation for various lines of laboratory, research, testing, and inspecting work.

With the establishment of the College Practice House, House Administration is being more effectively taught than was formerly possible without this equipment. This year a new course in Institutional Management will be offered for the first time, giving practice in the organization, equipment, and management of a fifty-unit dining room. Students trained in such a course should be able easily to adapt themselves to institutions of larger units. Practical work is also given in the housekeeping department of the women's dormitories where the problems of planning, equipping, and management of larger institutions are studied.

Quartered in a new building, provided with a thoroughly practical modern heating, ventilating, and sanitary system, and equipped with the most approved facilities for conducting the work of the various departments, the School of Home Economics is in a very fortunate position for making its courses of the utmost value to its patrons—not only to its resident students, but to the communities of the State at large wherever its extension activities may penetrate.

REQUIREMENTS FOR GRADUATION IN THE SCHOOL OF HOME ECONOMICS

In order to secure the degree in Home Economics, a minimum of 132 college credits must be completed. The subjects required in the Freshman and Sophomore years are prescribed. The subjects for the Junior and Senior years are in part prescribed, and the remaining credits elected.

DEGREE COURSES IN HOME ECONOMICS

Candidates for the degree of Bachelor of Science in Home Economics will pursue one of the prescribed group courses for the first two years. The Freshman and Sophomore years of these courses are similar; but at the beginning of the Junior year the courses begin to differentiate in the direction of the aim of each course. The Junior and Senior years allow electives from the several groups of studies in Home Economics and from other schools and departments in the College.

Group I (a) comprises courses that offer to women the opportunity to prepare themselves to become teachers of Household Science and Art, extension workers, or institutional managers. The first two years, as prescribed, give the necessary foundation for any one of these occupations; the Junior and Senior years are in part elective, a fact which provides for specialization in any one of these departments.

	Semester	
	1st	2nd
Freshman Year		
General Chemistry, (Chem. 102, 103).....	3	3
Textiles and Clothing, (H. A. 104, 105).....	4	4
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32).....	3	3
Principles of Botany, (Bot. 24).....		2
Library Practice, (Libr. 1).....	½	
Hygiene, (Phys. Ed. 10).....	½	
Survey of Home Economics, (H. S. 50).....	1	
Gymnasium, (Phys. Ed. 5, 6).....	1	1
	<hr/> 15	<hr/> 15
Sophomore Year		
Organic Chemistry; Chemistry of Foods (Chem. 200, 402).....	4	4
Foods and Cookery, (H. S. 106, 107).....	4	4
Design and Color, (Art 204).....	2	
Household Physics, (Phys. 133, 134).....	2	2
Household Bacteriology, (Bact. 304).....		3
Modern Language.....	3	3
Gymnasium, (Phys. Ed. 7, 8).....	1	1
	<hr/> 16	<hr/> 17

SUGGESTED COURSE FOR MAJOR IN HOUSEHOLD ARTS

	Semester	
	1st	2nd
Junior Year		
Vocational Psychology, (Psy. 220).....	3	
Physiology, (Zool. 207).....	3	
Principles of Education, (Ed. 100).....		3
Secondary Education in Home Economics (H. E. Ed. 400)		3
Costume Design, (H. A. 701).....	2	
Advanced Clothing and Textiles, (H. A. 106).....	4	
House Construction and Decoration, (H. A. 501).....		3
Millinery, (H. A. 301).....		2
Principles of Economics, (Com. 211).....	2	
Housewifery, (H. Ad. 510).....	2	
House Sanitation, (H. Ad. 301).....		2
Modern Language	3	3
	—	—
	17	18

Senior Year		
Dietetics, (H. S. 201).....	4	
House Administration, (H. Ad. 501).....		3
Advanced Textiles, (H. A. 601).....	2	
Applied Dress Design, (H. A. 205).....	3	
Tailoring, (H. A. 203).....		3
Applied Design, (H. A. 405).....	2	
Applied Design, (H. A. 407).....		2
Mothercraft, (H. S. 512).....	1	
Educational Psychology, (Psy. 210).....		2
Survey Course in Home Economics (H. E. Ed. 410).....	1	
Practice Teaching, (H. E. Ed. 420 or 430).....		3
Practice House (H. Ad. 530).....	4	
Electives		4
	—	—
	17	17

SUGGESTED COURSE FOR MAJOR IN HOUSEHOLD SCIENCE

	Semester	
	1st	2nd
Junior Year		
General Psychology, (Psy. 200).....	3	
Physiology, (Zool. 207).....	3	
Principles of Education, (Ed. 100).....		3
Secondary Education in Home Economics (H. E. Ed. 400)		3
Costume Design, (H. A. 701).....	2	
Advanced Clothing and Textiles, (H. A. 106).....		4
House Administration, (H. Ad. 501).....		3
House Sanitation, (H. Ad. 301).....	2	
Principles of Economics, (Com. 211).....	2	
Dietetics, (H. S. 201).....		4
Modern Language	3	3
	—	—
	18	17
Senior Year		
Practice House, (H. Ad. 530).....	4	
Practice Teaching, (H. E. Ed. 420 or 430).....	3	
Institutional Management, (H. S. 505).....		4
House Construction, (H. A. 501).....		3
Advanced Textiles, (H. A. 601).....		2
Mothercraft, (H. S. 512).....	1	
Survey Course in Home Economics, (H. E. Ed. 410).....		1
Housewifery, (H. Ad. 510).....	2	
Educational Psychology, (Psy. 210).....	2	
Electives	5	7
	—	—
	17	17

Students training for extension work should elect courses including Rural Sociology, Public Speaking, Methods of Demonstration, and Typewriting (Com. 410-411; 2 credits each).

General Group

A minimum of 18 credits must be chosen from this group selected from departments such as:

English, at least 6 credits	
Economics	} at least 6 credits
Political Science	
Sociology	
History	
Language at least 6 credits	
Mathematics	
Art	

Science Group

A minimum of 3 credits must be chosen from this group.

Physiology 207 (prerequisite to Dietetics)
 Zoology
 Chemistry
 Botany
 Bacteriology
 Physics

Home Economics Group

A minimum of 22 credits must be chosen from this group.

(a) Household Science		Semester	
Dietetics, (H. S. 201).....	4	either	semester
House Sanitation, (H. Ad. 301).....	2	"	"
Housewifery, (H. Ad. 510).....	2	"	"
House Administration, (H. Ad. 501).....	3	"	"
Home Nursing, (H. S. 515).....	4	"	"
Practice Housekeeping, (H. Ad. 530).....	4	"	"
Mothercraft (H. S. 512).....	1	"	"

(b) Household Art

Applied Dress Design, (H. A. 205).....	3	either	semester
Advanced Textiles, (H. A. 601).....	2	"	"
Costume Design, (H. A. 701).....	2	"	"
Advanced Clothing and Textiles, (H. A. 106).....	4	"	"
Millinery, (H. A. 301).....	2	"	"
House Construction, and Furnishing, (H. A. 501)	3	"	"
Tailoring, (H. A. 203).....	3	"	"

(c) House Administration		Semester	
Dietetics, (H. S. 201).....	4	either	semester
House Sanitation, (H. Ad. 301).....	2	"	"
Housewifery, (H. Ad. 510).....	2	"	"
House Administration, (H. Ad. 501).....	3	"	"
House Construction, and Furnishing (H. A. 501)	3	"	"
Advanced Textiles, (H. A. 601).....	2	"	"
Advanced Clothing and Textiles, (H. A. 106).....	4	"	"
Home Nursing, (H. S. 515).....	4	"	"

(d) Institutional Management			
Dietetics, (H. S. 201).....	4	either	semester
Institutional Management, (H. S. 504).....	3	"	"
Institutional Management, (H. S. 505).....	4	"	"
Catering, (H. S. 210).....	2	second	"
Home Nursing, (H. S. 515).....	4	either	"

(e) Applied Design		1st	2nd
Applied Design, (H. A. 405).....	2		
Hand Work and Weaving, (H. A. 407).....			2
Advanced Design, (Art 205, 305, or 306).....	2		
Clay Modeling and Pottery (Art 413, 414).....	2		2
Metal Work (Art 600, 601).....	2		2

Industrial Education Group

Vocational Psychology, (Psy. 220).....	3	either	semester
Educational Psychology, (Psy. 210).....	2	"	"
Principles of Education, (Ed. 100).....	3	"	"
Secondary Education in Home Economics, (H. E. Ed. 400)	3	"	"
Survey Course in Home Economics, (H. E. Ed. 410)	1	"	"
Practice Teaching, (H. E. Ed. 420 or 430).....	3	"	"

Home Economics Education 400 is prerequisite to Home Economics Education 420 and 430.

Free Electives

An aggregate of 26 credits may be free electives. These may be chosen from any school or department in College, such as Education, Agriculture, Forestry, Commerce, Pharmacy, etc., provided the prerequisites are met.

Group I (b). This group comprises courses that offer to women the training prescribed by the State Board for Vocational Education to prepare as **Smith-Hughes teachers** of Home Economics in the schools of Oregon.

	Semester	
	1st	2nd
Freshman Year		
General Chemistry, (Chem. 102, 103).....	3	3
Textiles and Clothing, (H. A. 104, 105).....	4	4
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32).....	3	3
Principles of Botany, (Bot. 24).....		2
Library Practice, (Libr. 1).....	$\frac{1}{2}$	
Hygiene, (Phys. Ed. 10).....	$\frac{1}{2}$	
Survey of Home Economics, (H. S. 50).....	1	
Gymnasium, (Phys. Ed. 5, 6).....	1	1
	—	—
	15	15

Sophomore Year		
Organic Chemistry, Chemistry of Foods (Chem. 200, 402)	4	4
Foods and Cookery, (H. S. 106, 107).....	4	4
Design and Color, (Art 204).....	2	
Household Physics, (Phys. 133, 134).....	2	2
Household Bacteriology, (Bact. 304).....		3
English 51, 52.....	3	3
Gymnasium, (Phys. Ed. 7, 8).....	1	1
	—	—
	16	17

Junior Year		
General Psychology, (Psy. 200).....	3	
Physiology, (Zool. 207).....	3	
Principles of Education, (Ed. 100).....		3
Secondary Education in Home Economics, (H. E. Ed. 400)		3
Costume Design, (H. A. 701).....	2	
Advanced Clothing and Textiles, (H. A. 106).....	4	
Dietetics, (H. S. 201).....		4
House Sanitation, (H. Ad. 301).....	2	
Housewifery, (H. Ad. 510).....		2
Electives	4	5
	—	—
	18	17

Senior Year	Semester	
	1st	2nd
Advanced Textiles, (H. A. 601).....	2	
House Construction and Furnishing, (H. A. 501).....	3	
House Administration, (H. Ad. 501).....		3
Practice House, (H. Ad. 530).....	4	
Mothercraft, (H. S. 512).....		1
Vocational Education, (Ed. 110).....	2 either semester	
Survey Course in Home Economics, (H. E. 410).....		1
Practice Teaching, (H. E. Ed. 420 or 430).....		3
Electives	8	8
	—	—
	17	17

For list of possible electives see page 313.

Sociology.

1. At least 6 credits in Economics, Political Science, or
2. Enough other electives to total 132 credits.

Group II comprises courses that offer to women the opportunity to prepare themselves in Household Science and Household Art primarily for the home, and at the same time afford them abundant opportunity, by the freedom of election in the junior and senior years, for the gratification of individual inclination through a study of Art, English, Modern Language, the Sciences, Horticulture, including Floriculture and Landscape Gardening, Pharmacy, Mines, Physical Education, etc. Group II does not prepare students for positions as teachers, extension workers or institutional managers.

Freshman Year	Semester	
	1st	2nd
Household Chemistry, (Chem. 12, 13).....	3	3
Textiles and Clothing, (H. A. 104, 105).....	4	4
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32).....	3	3
Principles of Botany, (Bot. 24).....		2
Library Practice, (Libr. 1).....	$\frac{1}{2}$	
Hygiene, (Phys. Ed. 10).....	$\frac{1}{2}$	
Survey of Home Economics, (H. S. 50).....	1	
Gymnasium, (Phys. Ed. 5, 6).....	1	1
	—	—
	15	15

	Semester	
	1st	2nd
Sophomore Year		
General Science, including Physiology, Bacteriology, and Physics	4	4
Foods and Cookery, (H. S. 106, 107).....	4	4
Design and Color, (Art 204).....		2
English 51, 52.....	3	3
Modern Language	3	3
Household Accounting, (Com. 120).....	1	
Gymnasium, (Phys. Ed. 7, 8).....	1	1
	16	17

In view of the fact that this course permits of greater election of subjects, suggestive outlines for junior and senior years are not included.

The work of the junior and senior years may be elected from groups below with the restrictions indicated at the head of each group.

General Group

A minimum of 21 credits must be chosen from this group selected from departments such as:

Economics	}	at least 6 credits
Political Science		
Sociology		
Psychology, at least 3 credits		
English, 6 credits		
History		
Modern Language, 6 credits.		
Mathematics		
Art		

Science Group

A minimum of 3 credits must be chosen from this group.

Physiology 207, prerequisite to Dietetics
 Zoology
 Chemistry
 Botany
 Bacteriology
 Physics

Home Economics Group

A minimum of 12 credits must be chosen from this group.

(a) Household Science

Dietetics, (H. S. 203).....	4	first semester
House Sanitation, (H. Ad. 301).....	2	“ “
Housewifery, (H. Ad. 510).....	2	second “
House Administration, (H. Ad. 501).....	3	“ “
Home Nursing, (H. S. 515).....	4	either “
Practice Housekeeping, (H. Ad. 530).....	4	“ “
Mothercraft	1	first semester

(b) Household Art

Advanced Dress Design, (H. A. 205).....	3	first semester
Advanced Textiles, (H. A. 601).....	2	either “
Costume Design, (H. A. 701).....	2	“ “
Advanced Textiles and Clothing, (H. A. 106).....	3	“ “
Millinery, (H. A. 301).....	2	“ “
House Construction and Decoration (H. A. 501).....	3	“ “
Tailoring, (H. A. 203).....	3	“ “

(c) House Administration

Dietetics, (H. S. 203).....	4	first semester
House Sanitation, (H. Ad. 301).....	2	either “
Housewifery, (H. Ad. 510).....	2	“ “
House Administration, (H. Ad. 501).....	3	“ “
House Construction and Decoration, (H. A. 501).....	3	“ “
Advanced Textiles, (H. A. 601).....	2	“ “
Advanced Textiles and Clothing, (H. A. 106).....	3	“ “
Home Nursing, (H. S. 515).....	4	“ “
Practice Housekeeping, (H. Ad. 530).....	4	“ “

Semester**(d) Institutional Management**

	1st	2nd
Dietetics, (H. S. 203).....	4	
Institutional Management, (H. S. 504, 505).....	3	4
Catering, (H. S. 210).....		2

(e) Applied Design

Applied Design, (H. A. 405, 407).....	2	2
Advanced Design, (Art 305, 306).....	2	2
Clay Modeling and Pottery, (Art 414, 413).....	2	2
Metal Work, (Art 600, 601).....	2	2
Landscape Architecture and Drawing (R. A. 601, 602)....	3	3

Free Electives

An aggregate of 33 credits may be free electives. These may be chosen from any school or department in College, such as Agriculture, Forestry, Commerce, Pharmacy, etc., provided the pre-requisites are met.

Students in Home Economics who wish to minor in Commerce should take the following courses as suggested by the Dean of the School of Commerce:

MINOR IN COMMERCE

	Semester	
	1st	2nd
Freshman or Sophomore Year		
Stenography (Com. 400, 401).....	3	3
Typewriting (Com. 410, 411).....	2	2
	—	—
	5	5

Sophomore or Junior Year

Stenography and Typewriting, (Com. 402, 403).....	3	3
Bookkeeping and Accounting, (Com. 100, 107).....	4	3
	—	—
	7	6

DIETITIAN'S COURSE

The course outlined below is intended for women who desire competent training to fit themselves to become dietitians in hospitals, institutions under state, county, charity, or private management where large numbers of people are housed and fed, or dietitians under military or Red Cross auspices. Students matriculating for this course must be at least twenty-one years of age, and graduates of a four-years high-school course of study or its equivalent. To secure a dietitian's certificate, sixty-eight credits are required, including three months of practical field work.

	Semester	
	1st	2nd
First Year		
Household Chemistry, (Chem. 12, 13).....	3	3
College Rhetoric, (Eng. 31, 32).....	3	3
Physiology, (Zool. 207, 208).....	3	3
Home Economics Bacteriology, (Bact. 304).....		3
Foods and Cookery, (H. S. 106).....		4
Household Management, (H. S. L.).....	2	
Principles of Economics, (Com. 211).....	2	
Typewriting, (Com. 410).....	2	
	—	—
	15	16
Second Year		
Nutritional Physiology, (Zool. 205).....		3
Foods and Cookery, (H. S. 107).....	4	
Dietetics, (H. S. 203).....		4
* Home Nursing, (H. S. 515).....	4	
Institutional Management, (H. S. 504, 505).....	3	4
English or Modern Language.....	3	3
Vocational Psychology (Psy. 220).....		3
Home Economics Bacteriology, (Bact. 305).....	3	
	—	—
	17	17

Field work to be arranged, 3 credits.

* Students who have had hospital training may choose an elective in place of H. S. 515, 4 credits.

HOMEMAKERS' COURSES

The one-year Homemakers' course, established 1914, is provided especially for those women whose schooling may not qualify them to enter the degree courses, whose duties demand that they shall content themselves with a brief period of training for their life work, or whose aim in seeking training at the College is exclusively practical. The purpose of the other short courses in Home Economics is quite similar to this — to provide, in the short time assigned to the particular courses, the fullest and most fruitful training that is possible to offer with the facilities of a thoroughly modern School of Home Economics, and to present this training in such a way that it shall be most immediately and constructively helpful to the particular patrons of the given courses. Only the

one-year Homemakers' course and the regular degree courses are outlined here, the others being presented in the usual special bulletins issued for the Winter Short Course and the Summer School.

Admission to any of the Homemakers' courses demands an educational qualification not greater than an eighth grade or common-school course; and in the instance of mature persons, otherwise capable of carrying on the work, even this qualification may be waived.

One-year Homemakers' Course	Semester	
	1st	2nd
Foods and Cookery, (H. S. H and I).....	5	5
Care of Children, (H. S. J).....	1	
Clothing and Textiles, (H. A. R and S).....	4	4
Household Management, (H. S. L).....	2	
Elementary Physiology, (Zool. A).....	2	
Home Nursing and Invalid Cookery, (H. S. M).....		2
House Furnishing, (H. A. N).....		2
Hygiene, (Phys. Ed. 10).....	1½	
Gymnasium, (Phys. Ed. 1, 2).....	1	1
Millinery, (H. A. T).....		2
	<hr/>	<hr/>
	15½	16

HOUSEHOLD ART

HELEN LEE DAVIS, Associate Professor
CORA PLATT MILLER, Instructor
HELEN PEER ROBINSON, Instructor
JUNE SEELEY, Instructor
LOUISE ALBERTA SCHNEIDER, Instructor
MARGARET MOREHOUSE, Instructor
JESSIE BILES, Instructor

The department of Household Art is located in the new Home Economics building and occupies one-half of the second floor and the entire third floor of the completed east wing of this structure. There are five large laboratories, with excellent modern equipment, devoted to this department.

The following courses are offered:

100. Elementary Clothing and Textiles. (For Freshmen students who have had no high-school work in sewing.) The fundamental processes of hand and machine sewing applied to the designing and constructing of under garments and household articles. Free-hand cutting. Drafting. Use of patterns. Decorative needlework. Repairing.

Textiles: Tracing of development of textile industry from primitive times in order better to understand the modern industry. Study of production, manufacture, and distribution of cotton and linen as influencing factors in their cost, quality, etc. Study of cottons and linens relative to their use in the home and for clothing purposes.

Freshman year; either semester; 4 credits; 2 recitations; 3 laboratory periods; 4 hours outside preparation. Fee \$1.00.

104. Clothing and Textiles. (For freshman students who have had one year or more of sewing in accredited high schools. If students are not able to carry this work successfully they will be required to take 100.) Choice of materials and trimmings from standpoint of appropriateness, economy and beauty. Designing and construction of cotton and linen dresses. Free-hand cutting. Drafting. Use of commercial patterns. Remodeling problem. Preparation and use of dress form.

Textiles: Tracing of development of textile industry from primitive times in order better to understand the modern industry. Study of production, manufacture, and distribution of cotton and linen as influencing factors in their cost, quality, etc. Study of

cottons and linens relative to their use in the home and for clothing purposes.

Freshman year; either semester; 4 credits; 2 recitations; 3 laboratory periods; 4 hours outside preparation. Fee \$1.00.

105. Clothing and Textiles. (Continuation of course 104.) Choice of materials and trimmings from standpoint of appropriateness, economy and beauty. Principles of Design applied to silhouette, proportion, line, and color. Designing and constructing of lingerie and wool dresses, and children's clothes. Draping and designing on the figure.

Textiles: Study of production, manufacture and distribution of wool and silk as influencing factors in their cost, quality, etc.

Study of silk and wool materials relative to their use in the home and for clothing purposes. Children's clothes. Ready-made clothing vs. home-made. Sweat-shop work. Social agencies for bettering industrial conditions. Responsibility of consumer, etc.

Prerequisites: H. A. 104, Art 102. Freshman year; either semester; 4 credits; 2 recitations; 3 laboratory periods; 4 hours outside preparation. Fee \$1.00.

106. Advanced Clothing and Textiles. Designing and constructing of fancy blouses and silk afternoon dresses. Renovation problems. Designing and draping on figure.

Appropriate and economic dress. Cost of clothing. Hygiene of clothing. Care of clothing. Minor textile fibers, their use and importance. Study of laces and embroideries.

Prerequisites: H. A. 104, 105; Art 102, 103; H. A. 701 either prerequisite or parallel. Junior year; either semester, 4 credits; 1 recitation; 3 laboratory periods; 2 hours outside preparation. Fee \$1.00.

203. Tailoring. Principles and processes of tailoring taught on small-size skirts and coats, and the making of one cloth or silk suit.

Development of factory system. Modern industrial conditions. Labor organizations for civic and industrial improvement. Laws of Oregon.

Prerequisites: H. A. 106. Elective; either semester; 3 credits; 1 recitation; 6 hours laboratory; 2 hours outside preparation. Fee \$1.00.

205. Applied Dress Design. Designing, modeling and constructing of afternoon and evening dresses. Emphasis on design and color.

Study of dress from historic and artistic standpoints.

Prerequisites: H. A. 106, 701, Art 204. Elective; either semester; 3 credits; 1 recitation; 6 hours laboratory. Fee \$1.00.

301. Millinery. Designing and constructing frames. Methods of covering. Making and placing of trimmings. Renovation of materials.

Elective; either semester; 2 credits; 2 laboratory periods; 2 hours outside preparation. Fee \$1.50.

405. Applied Design. Form of decorative art which involves careful consideration of form, color, and design. These principles will be considered in basketry, caning, and rushing.

Elective; either semester; 2 credits; 3 laboratory periods. Fee \$3.00.

407. Applied Design. Designs made and executed in weaving, embroidery, and various forms of decoration for clothing and house furnishings. Dyeing. Emphasis on design and color.

Elective; either semester; 2 credits; 3 laboratory periods. Fee \$3.00.

501. House Construction and Decoration. Plans made for medium-sized homes; the best utilization of space, the most economical placing of equipment and the decoration and furnishing of a house in the most economical, sanitary, and artistic manner.

Elective; either semester; 3 credits; 2 recitations; 2 laboratory periods; 3 hours outside preparataion. Fee \$1.00.

601. Advanced Textiles. Principles of art, economics, hygiene, and psychology applied to clothing. Study of adulterants and substitutes. Microscopic and chemical analysis of materials.

Senior elective; either semester; 2 credits; 2 recitations; 4 hours outside preparation. Fee \$1.00.

701. Costume Design. Study of the figure. Sketching of costumes. Study of line, proportion, and color in relation to good taste in dress. Problems in designing and modeling based upon historic study and art principles.

Prerequisites: Art 102, 103, 204. Either semester; 2 credits; 2 lectures; 1 laboratory period; 2 hours outside preparation. Fee \$1.50.

N. House Furnishing. The furnishing of the home from an economic, sanitary, and artistic standpoint. Exhibits and excursions.

Homemaker's course; second semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

R. Textiles and Clothing. Textile lectures given for the purpose of assisting the homemaker in her selection, use, and care of fabrics in the home. Laboratory work is planned to give the student practical experience in the making of all needlework problems that are to be met in the home.

Homemakers' course; either semester; 4 credits; 2 recitations; 4 laboratory periods; 2 hours outside preparation. Fee \$1.00.

S. Textiles and Clothing. Continuation of course R. Lectures on good taste in dress, cost of clothing, hygiene of clothing, care of clothing. Laboratory work gives the student experience in the making of wash dresses, children's clothes, wool dresses, and the renovating of clothing.

Homemakers' course; either semester; 4 credits; 2 lectures; 4 laboratory periods; 2 hours outside preparation. Fee \$1.00.

T. Millinery. Designing and constructing hats. Making and placing of trimmings. Renovation of materials.

Homemakers' course; 2 credits; 2 laboratory periods. Fee \$1.50.

Note: In all H. A. courses orders will be taken for students who do not wish to make garments for themselves.

HOUSEHOLD SCIENCE

AVA BERTHA MILAM, Professor
ALICE MARKS DOLMAN, Assistant Professor
SARAH LOUISE LEWIS, Assistant Professor
ALMA GRACE JOHNSON, Assistant Professor
LAURA JEAN CHENEY, Instructor
SIBYLLA HADWEN, Instructor
CHRISTIE MOORE, Instructor
MARY ELIZABETH KOLL, Instructor
INEZ VALENTIA BOZORTH, Instructor
MINNIE KALBUS, Instructor
SARA WATT PRENTISS, Instructor

The department of Household Science is located in the new Home Economics building and occupies the basement, the first floor, and one-half of the second floor of the completed east wing of this structure. There are four large laboratories, with excellent modern equipment for all types of food preparation. A small laboratory, equipped with various kinds of cooking apparatus, is designed for special class work. Adjoining this laboratory is a dining room large enough to accommodate twenty people. This is used for meal serving and enables the students to put into actual practice the knowledge gained elsewhere.

With the leasing of a furnished eight-room house in close proximity to the College, a new and significant feature was added to the Home Economics course in September, 1916. In groups of eleven, advanced students are afforded the opportunity of living in the house for six to eight weeks under the supervision of a House Administration faculty woman. The problems of house-keeping, including the purchasing, care, and cooking of food, the planning of meals, the care of the house and family laundry, are conducted by the students. The economic side is given particular attention, and the fees paid by the students in this course cover the entire operating expenses of the house.

The new course in Institutional Management offered advanced students for the first time this year, has been made possible by securing a furnished house near the Home Economics building, specially arranged and equipped to serve at least fifty people daily. Here the students will have the opportunity of working out the problems of a fifty-unit institution, from the general helper to the manager. There is no fee for this course and living is furnished students while resident in the house.

The following courses are offered:

100. Principles of Foods and Cookery. This course is for students who have had no domestic science in high school. It aims to give laboratory technique and a resume' of elementary cookery and is a prerequisite to H. S. 106; sophomore year; either semester; 2 credits; 1 lecture; 2 two-hours laboratory periods. Fee \$3.00.

106. Foods and Cookery. An introduction to the subject of foods in their scientific and economic aspect, selection, preparation, and use. The processes of digestion, absorption, and assimilation.

Prerequisites. General Chemistry 102, 103; Principles of Botany 24; parallel, Organic Chemistry 200, or Household Chemistry and Physiology. Household Science; sophomore year; either semester; 4 credits; 2 lectures; 2 three-hours laboratory periods. Fee \$6.00.

107. Foods and Cookery. A continuation of course 106; canning and preserving of foods, menu making, and table service.

Prerequisites: Foods and Cookery 106; parallel, Chemistry of Foods 402. Household Science; sophomore year; either semester; 4 credits; 2 lectures; 2 three-hours laboratory periods. Fee \$6.00.

120. Methods of Demonstrations. A course preparing students to give public demonstrations in food selection and preparation. Types of demonstrations, equipment required, organization of plans, general method of procedure, results to be obtained from demonstrations. Illustrative demonstrations by instructor. Student demonstrations.

Prerequisite: H. S. 106, 107. Household Science; senior elective; second semester; 1 credit; 1 three-hours laboratory period. Fee \$1.50.

190. Camp Cookery. Instructions in various ways of combining into palatable and nutritious products such food materials as are available for use in camps; the making of different kinds of breads, as well as mulligans, and other camp dishes. Practice during the latter part of the course in preparing food out of doors by means of dutch ovens, reflectors, and improvised cooking utensils.

Household Science elective; junior or senior men in Forestry, Agriculture, Engineering, and Commerce courses; second semester; 1 credit; 1 laboratory period. Fee \$2.50.

191. Cookery for Men. A course for men who are planning and preparing their own meals or who are acting as managers of clubs. The uses of food in the body, factors affecting food requirements, making of menus suited to the needs of individuals under various living conditions. The practical work includes the making of numerous dishes and the serving of well-balanced meals at reasonable cost.

Household Science; elective to all men of the College; first semester; 1 credit; 1 three-hours laboratory period. Fee \$2.50.

201. Dietetics. A scientific study of food materials in their relation to the daily dietary of families under various conditions of health and environment; a study of the dietary standards of metabolism. A comparison of the nutritive values of the common foods, made by computing, preparing, and serving dietaries of specific costs, furnishing specific nutrients.

Prerequisites: Household Science 106 and 107; Physiology 207. Elective; either semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$4.00. Texts: Rose, Laboratory Manual of Dietetics. Sherman, Chemistry of Foods and Nutrition. Reference assignments.

203. Dietetics. A simplified course in dietetics dealing with a study of food materials in their relations to daily dietaries of families under various conditions of health and environment, and a comparison of nutritive values of common foods made by computing, preparing, and serving dietaries of specific costs furnishing specific nutrients.

Prerequisites: Household Chemistry, 6 credits; Household Science 106, 107, and Physiology 207. Elective; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$4.00.

210. Catering. Designed for students who are interested in the management of tea rooms and lunch rooms and in catering for private entertainments. The work includes the purchase, preparation, and service of refreshments at such functions as afternoon teas, luncheons, and small banquets. The students are expected to devote at least six hours a week to the course.

Prerequisite: Household Science 201 or 203. Elective; senior year; second semester; 2 credits; 1 laboratory period of six hours. Fee \$2.00.

301. House Sanitation. The house as a factor in health. Situation, surroundings, ventilation, heating, drainage, plumbing,

lighting, and furnishing of the house. Investigation of general sanitary conditions from a practical and scientific standpoint with special reference to the needs of the community, household, and school.

Junior year; either semester; 2 credits; 2 recitations. Text: Talbot, House Sanitation (as guide).

501. Household Administration. The organization and control of the home. The economic relations of the household, applying scientific and economic principles to its problems. A study of family income and its equivalent in productive labor within the household. Family expenditures and their regulation. The budget as a measure of standards of living. The domestic service problem and efficiency of the household.

Prerequisite: (for degree students) Economics 211. Household Science; junior or senior elective; either semester; 3 credits; 3 lectures.

504. Institutional Management. The course is designed to give practice in handling food materials in large quantities; making of menus; methods of record keeping; planning and equipping of large institutions. Problems of cost and replacements; practical work in the housekeeping departments of Waldo and Cauthorn Halls, where these problems are studied, also those of the care of linen, sanitation, and service.

Prerequisite: (for degree students) Household Science 201 or 203, Economics 211; (for Dietitians 106 and 107). Parallel or prerequisite; Household Administration. Senior year; either semester; 3 credits; 2 lectures; 1 three-hours laboratory period.

505. Institutional Management. This course is planned to give to the advanced student practical work in the management of a fifty-unit dining room. Each girl is assigned in turn to the various kitchen and dining-room duties.

Prerequisite: H. S. 201 or its equivalent. H. S.; elective; senior year; either semester; $\frac{1}{2}$ credit a week. No fee; living furnished while resident in house.

510. Housewifery. Efficiency in the care of the house, from the chemical, economic, and practical standpoint. The treatment of floors, walls, and woodwork. The removal of stains. The cleaning of rugs and carpets. Laundering of household linen and clothing. The selection of cleaning apparatus and machinery.

Prerequisites: General Chemistry 100, 101. Junior year; either semester; 2 credits; 1 lecture; 1 three-hours laboratory period. Fee \$0.50. Texts: L. Ray Balderston, Laundering; E. G. Osman, Cleaning and Renovating at Home.

512. Mothercraft. Brief study of the child from time of conception to maturity, with special emphasis on care and feeding of the infant, and young child.

Prerequisite: Physiology 207; 1 credit; 1 lecture.

515. Home Nursing. Care of patient under home conditions. Symptoms. First aid to the injured. Management of communicable diseases. Disease as affected by foods. Invalid diets.

Prerequisite: Physiology 207; Bacteriology 304; 3 recitations; 1 two-hours laboratory period; 4 credits. Fee \$2.00.

530. Practice Housekeeping. This course deals with the problems of homemakers. The students put into actual practice and apply to real home conditions the Principles of Cookery, Housewifery, Household Management, and Methods of Laundering, studied in their college course. Each girl does every duty concerned in the management of the house during the time she is a resident there. Special attention is given to the economic side of the question. The students carry their regular college work during the time they live in the practice house.

Prerequisites: Household Science 107 or its equivalent. Household Science elective; junior and senior years; either semester; $\frac{1}{2}$ credit a week. Fee \$5.00 a week living expenses.

550. Modern Problems in Household Administration. The topics assigned for research will be chemical, physiological, bacteriological, economical, or sociological, according to the preferences and training of the individual student.

Graduate year; first semester; credits to be arranged.

551. Modern Problems in Household Administration. A continuation of the research work commenced in course 550.

Graduate year; second semester; credits to be arranged.

701. Special Research in Cookery. In assigning research problems for graduate students, both the previous training and the student's preferences are considered. Assignment of problems to be worked upon during the year is made by the professor in charge.

Graduate year; first semester; credits to be arranged.

702. Special Research in Cookery. Continuation of research work commenced in course 701.

Graduate year; second semester; credits to be arranged.

H. Foods and Cookery. The study of foods, source, economical purchase, storage, and cookery. Gives the student a working knowledge of the nutritive value of foods. Offers extended experience in practical cooking, with careful estimation of cost and quantity, special attention being given to preservation of foods.

Homemakers' course; first semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$6.00.

I. Foods and Cookery. A continuation of course H. This course aims to present the fundamental principles of human nutrition and to teach their application under varying physiological, economic, and social conditions. Special attention given to making of menus and preparation and service of meals.

Homemakers' course; second semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$6.00.

J. Care of Children. Physical and mental development. Proper feeding and clothing. General care from infancy through adolescence.

Homemakers' course; second semester; 1 credit; 2 lectures.

L. Household Management. Lectures and laboratory hours given to study of home problems, the choice of site for the house, construction, lighting, heating, plumbing, disposal of waste, and general care of home. The study of modern labor-saving devices, the best cleaning agents, care of floors and woodwork, and the common laundry operations. This course is optional with English.

Homemakers' course; first semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

M. Home Nursing and Invalid Cookery. Observation of symptoms. Administration of food and medicine. Care of the sick under home conditions. Preparation of food for the invalid. Manner of service.

Homemakers' course; second semester; 2 credits; 2 lectures; 1 laboratory period. Text: Aiken, Home Nurses' Handbook of Practical Nursing. Fee \$2.00.

SCHOOL OF MINES

EDGAR KIRKE SOPER, Dean

Four-years courses leading to the degree of Bachelor of Science in Mining Engineering, Mining Engineering (in Geology), and Ceramic Engineering are offered. The advanced degrees of Mining Engineer, (in Geology), Mining Engineer, and Ceramic Engineer are conferred upon the completion of the requisite amount of graduate work as prescribed elsewhere in this Catalogue.

Instruction is given by means of lectures and textbooks, supplemented by recitations, and by much work in the laboratories and field. While the more theoretical studies are not neglected, a determined effort is made to emphasize the practical application and value of all the subjects taught. For this reason, nearly fifty percent of a student's time is spent in laboratory courses.

The School of Mines occupies a new, commodious, three-story and basement building especially designed for housing the lecture rooms and laboratories devoted to mining, metallurgy, ore dressing, geology, ceramic engineering, and closely allied subjects.

The first two years in all three departments are identical, and are intended to give the student a thorough comprehension of those studies basic to all branches of engineering; namely, Mathematics, Physics, Chemistry, Mechanical Drawing, Plane Surveying, and Shop Work. To these fundamental subjects are added courses in Mineral Industry, Crystallography and Blowpipe Analysis, and Determinative Mineralogy.

In the last two years, the student takes up the technical studies distinctive of the course pursued. This leads to considerable variation in the work of the different departments, as is indicated in the outline of courses. Statics and Dynamics, Strength of Materials, Hydraulics, and Electrical Machinery are required, however, in all courses except Geology.

At least two months employment in industrial lines closely allied to the course pursued, is a prerequisite to graduation.

The work in the School of Mines is so broad in nature that it should equip a student for general engineering operations of many kinds, but particular emphasis is placed, naturally, upon preparation for those fields of activity that are concerned with the discovery, mining or quarrying, and preparation for market, of the mineral wealth with which the Northwest is so richly endowed.

Equipment. The new Mines building provides spacious and well-lighted offices, laboratories, and lecture rooms for the work of this department.

The Assaying and Metallurgical laboratory is a cement-floored room 30 feet wide and 60 feet long on the first floor of the building and extends across the entire east end. It is amply lighted by windows on one side and both ends. At the south end of the room are the most modern types of oil and gasoline furnaces for fusion and other fire work. Conveniently arranged nearby are suitable lockers and work tables with the necessary tools, fluxes, etc. The north end of the room is adequately equipped with sinks, ventilating hoods, gas burners, electric hot plates, and other apparatus for carrying on the various operations involved in parting buttons, assaying solutions, making cyanide tests, etc. One corner of the laboratory is partitioned off for a balance room and provided with the most delicate balances for weighing the gold beads. Balances of both the Keller and Ainsworth makes are available.

The Crushing and Sampling laboratory in the basement is 25 feet by 30 feet. It contains a power-driven sample crusher of the latest design and one of the recently modeled disk grinders, for properly pulverizing samples for assay or other purposes. The usual bucking-board and muller and other hand-grinding devices are also available for student use, together with a Jones sampler and other appliances used in preparing samples. All such work is done in this room, to avoid dust in the other laboratories.

The Ore-Testing laboratory is a room 25 by 30 feet in the basement of the building. It is equipped with appliances for studying the behavior of ores when subjected to the various operations of jigging, vanner, table, and magnetic concentration.

The Mining Draughting room is furnished with convenient desks and tables and all necessary equipment for the use of mining students.

The Geology and Mineralogy laboratories and the Geological museum occupy the entire third floor of the Mines Building and are completely equipped with extensive collections of ores, rocks, minerals, thin, sections, and geologic and topographic maps. For detailed descriptions see under **Geology**.

MINING ENGINEERING

BURTON LEIGH CUNNINGHAM, Associate Professor

The course in Mining Engineering is designed to give the student thorough training in the fundamentals of the science of mining, metallurgy, and geology, and to prepare him for positions of responsibility in the industrial life of the country, and particularly in the mining field. The course is of such a comprehensive character that a graduate finds it of aid in varied employments. The positions which are open to graduates of the School of Mines, include: assayer, chemist, or metallurgist at mines and smelters; on staffs of Government and state geological surveys; on the staff of the Government Coast and Geodetic Survey; land or deputy mineral surveyor; draftsman and designer in engineering establishments; on the engineering and geological staffs of mining companies, oil companies, exploration companies, and railroads; and in the land classification work of the government forest service. He may expect that after having acquired the necessary maturity he will be competent to fill responsible positions in any one of the many branches of mining, milling, smelting, and geology.

DEGREE COURSE IN MINING ENGINEERING

Freshman Year	Semester	
	1st	2nd
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 105, 106).....	5	5
Mechanical Drawing (C. E. 107).....	3	
The Mineral Industry (Min. 209).....	1	
Descriptive Geometry (M. E. 153).....		3
Modern English Prose (Eng. 91, 92).....	2	1
Forging and Tool Dressing (Ind. Arts 158).....		2
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17½	<hr/> 17½

	Semester	
	1st	2nd
Sophomore Year		
Principles of Metallurgy (Met. 431).....		2
Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Phys. 101, 102).....	4	4
Quantitative Analysis (Chem. 400).....	4	
Crystallography and Blowpipe Analysis (Geol. 111).....	3	
Determinative Mineralogy (Geol. 112).....		3
Plane Surveying (C. E. 232).....		4
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	16 $\frac{1}{2}$	16 $\frac{1}{2}$

Junior Year

Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Hydraulics (I. E. 102).....		3
Electrical Machinery (E. E. 403).....		3
Metallurgy of Iron and Steel (Met. 410).....		2
General Geology (Geol. 135).....	3	
Petrology (Geol. 137).....	3	
Petrography (Geol. 139).....		2
Assaying (Met. 401).....	3	
Mine Surveying (Min. 212).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/>	<hr/>
	16	18

	Semester	
	1st	2nd
Senior Year		
Metallurgical Laboratory (Met. 423 and 424).....	2	2
Metallurgy of Gold and Silver (Met. 421).....	2	
Metallurgy of Copper, Lead, and Zinc (Met. 412).....		2
Mining and Power Equipment (Min. 231).....	3	
Mining Methods (Min. 224).....	3	
Mine Economics and Mining Law (Min. 222).....		3
Ore Dressing (Met. 425).....	4	
*Mine Plant Design (Min. 232) or Metallurgical Design (Met. 432).....		2
Economic Geology (Geol. 182).....	2	
Ore Deposits (Geol. 181).....		3
Problems in Economic Geology (Geol. 184).....		2
General Engineering Laboratory (Exp. E. 210).....		2
	16	16

Suggested Electives

Elementary Spanish (Spanish 301).....	3	
Elementary French (French 101).....	3	
Excavation, Explosives, and Blasting (Min. 226).....		2
Interpretation of Geologic and Topographic Maps (Geol. 186)		2
Technical English (Eng. 141).....	3	
Principles of Economics (Economics 210).....	3	

Upon the approval of the Dean, students may substitute a modern language for English in the freshman year.

* In the senior year, the student may choose between these two courses.

The following courses are offered:

209. The Mineral Industry. An introductory course designed to give to the School of Mines student a general idea of the main features of his profession. Elementary geology occupies the first two months of the semester and is a brief discussion of the subject, the aim being to summarize the various phases that are taken up in detailed courses later. Several lectures on the ceramic industry are given and several devoted to the essentials of mining and metallurgy. This course covers the whole field of the mineral industry. A certain amount of time is spent in the study of the mineral resources of Oregon.

Freshman year; first semester; 1 credit; 2 lectures. Required of students in the School of Mines, but elective to any one interested.

212. Mine Surveying. Supplementary to Plane Surveying, taken in the freshman year. Methods are studied in underground surveying and mine mapping, in locating and patenting claims, and in such geodetic and topographic surveying as a mining engineer is often called upon to do; facility in the practical application of these methods is imparted by actual work in the field. Considerable attention is given to the solution of the many problems involving surveying which arise in mining operations; and some time is devoted to the study of the laws regulating the location, possession, and operation of mineral deposits in the United States.

Prerequisite: C. E. 201. Junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Deposit \$2.00.

222. Mine Economics and Mining Law. A detailed study of the costs of mining and milling; methods of mine accounting and cost keeping; a study of the mining law of the United States, Canada, and Mexico; discussion of the economics of mining.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering. Senior year; second semester; 3 credits; 3 recitations.

224. Mining Methods. A study of the methods of mining, including explosives and blasting, prospecting, stoping, timbering, pumping, ventilation, transportation, hoisting, and mine sampling. Presented largely through lectures, and supplemented by textbook and directed reference work.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering. Senior year; first semester; 3 credits; 3 recitations.

225. Military Mining and Explosives. Types of explosives used in military work. The handling, storage, and use of explosives. Earth and rock excavation and blasting. Methods of tunneling, shaft sinking and quarrying. Mining methods used in trench and bomb-proof construction. Geologic factors influencing military mining operations. Geologic factors influencing ground-water seepage and methods of controlling seepage to keep trenches dry. Interpretation of topographic maps as an aid to mining operations.

Open to all students in the Reserve Officers Training Corps; second semester; 1 lecture; 1 recitation period each week; $\frac{1}{2}$ or 1 credit according to amount of time devoted to subject.

226. Excavation, Explosives, and Blasting. Methods and cost of earth and rock excavation, tunneling and shaft sinking, a study

of the various kinds of explosives used in mining and excavation work; methods of handling and storing explosives; and methods of blasting.

Prerequisites: Completion of freshman work in Engineering. **Elective.** Open to all sophomore, junior, and senior students in the School of Engineering and in the School of Mines. First semester; 3 credits; 3 lectures or recitations, with outside reading and reference work.

231. Mine and Power Equipment. A study of surface and underground equipment for mines, including haulage systems, hoists, compressors, drills, pumps, etc. The course also involves a discussion of the sources of power, water, hydro-electric, steam, gas, and compressed air, together with problems illustrating their application to mining operations. The subject is presented by means of lectures, supplemented by textbooks, trade catalogues, selected references in technical journals, and numerous problems which are assigned to the student for solution.

Prerequisites: Completion of freshman, sophomore, and junior work in Mining Engineering; senior year; first semester; 3 credits; 3 recitations.

232. Mine Plant Design. In this course each student is required to design and get out detailed plans and specifications for an ore bin, head frame, and other mine equipment, to meet the requirements of a hypothetical mine as given in problem.

Prerequisites: Completion of freshman, sophomore, junior, and first semester of senior work in Mining Engineering. Senior year; second semester; 2 credits; 2 three-hours periods a week in drafting room.

299. Practical Work in Mining: Students in the School of Mines are required, before the senior year, to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course being pursued. Evidence of the nature, quality, and sufficiency of the work will be passed upon by the proper department before credit is given. While the minimum requirement is two months, it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. Insight into the technical subjects studied later, also an appreciation of their application to the conditions met in practice on a commercial scale, are thus gained.

METALLURGY

CHARLES EDWARD NEWTON, Associate Professor

401. Assaying. The quantitative determination of the constituents of reagents, fluxes, ores, and metallurgical products. This work embodies the chemical and physical principles of assaying used in conjunction with technical methods.

Prerequisites: Chem. 301 and 401. Geol. 112. Junior year; first semester; 3 credits; 3 laboratory periods. Deposit \$20.00.

402. General Metallurgy. The object of this course is to give general information on the method of producing, manufacturing, using, and conserving the metals which are in general use in the arts.

Prerequisites: None. Elective. Open to all but Mining students; first semester; 3 credits; 3 recitations.

410. Metallurgy of Iron and Steel. The metallurgy and the manufacture of iron and steel, with reference to their properties, and their uses in the arts and in the field of engineering.

Prerequisites: Chem. 301 and 401. Physics 101 and 102. Required of all junior Mining students. Elective for students in the School of Engineering; junior year; second semester; 2 credits; 2 recitations.

412. Metallurgy of Copper, Lead, and Zinc. In this work each metal will be considered separately. The furnaces, processes, and apparatus used in the production of the metals from the ore, will be studied in detail.

Prerequisites: Met. 401 and 431. Senior year; second semester; 2 credits; 2 recitations.

414. Metallurgy of the Minor Metals. The metallurgy of mercury, tin, aluminum, nickel, arsenic, antimony, etc. A study of the methods of production and the uses in the arts.

Prerequisites: Met. 401 and 431. Elective; open to Mining and Chemical Engineering students; senior year; second semester; 2 credits; 2 recitations.

421. Metallurgy of Gold and Silver. The chemical and the physical principles of smelting, amalgamation, cyanidation, and general processes, together with the mechanical devices and operations necessary to carry on the work of producing gold and silver from their ores.

Prerequisites: Met. 401 and 431. Senior year; first semester; 2 credits; 2 recitations.

423-424. Metallurgical Laboratory. Laboratory tests in conjunction with courses 421, Metallurgy of Gold and Silver, and 412, Metallurgy of Copper, Lead, and Zinc.

Prerequisites: Met. 401 and 431. Senior year; first and second semesters; 2 credits; 2 three-hours laboratory periods. Deposit \$5.00 for each semester.

425. Ore Dressing. General principles of Ore Dressing as breaking, grinding, sizing, classifying, concentrating by jig and tables, and by special processes as magnetic, electrostatic, flotation, and air separation. Laboratory work includes work with laboratory size machines for most of the above processes.

Prerequisite: Met. 401. Senior year; first semester; 4 credits; 3 recitations; 1 three-hours laboratory period. Deposit \$3.00.

431. Principles of Metallurgy. A study of the properties of metals, alloys, temperature measurements, metallurgical operations, refractories, and fuels.

Prerequisites: Chem. 301 and 401. Physics 101 and 102. Sophomore year; second semester; 2 credits; 2 recitations a week.

432. Metallurgical Design. The study of plant flow sheets, the designing of apparatus for metallurgical operations, the working up of flow sheets for milling, smelting, and leaching operations.

Prerequisites: Met. 401 and 431. Elective for Mining students. Senior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00.

442. Electro-Metallurgy. The principles, processes, and apparatus involved in using electrical energy for the smelting and refining of ores and metals.

Prerequisites: Met. 401 and 431. E. E. 401. Elective for Chemical and Electrical Engineering students. Senior year; second semester; 2 credits; 2 recitations.

GEOLOGY

EDGAR KIRKE SOPER, Professor

GEORGE EDWARD GOODSPEED, Assistant Professor

While most of the courses in Geology are designed to meet the demands of the departments in the School of Mines, special courses are offered for students in Engineering, Forestry, and Agriculture. Those who desire to specialize in the geological side of mining are given an opportunity to take a special degree course in Mining Engineering, majoring in Geology.

Equipment. The laboratories for Geology are situated on the third floor of the Mines building and comprise a Geologic and Mining museum, a Mineralogic laboratory, and a Petrologic laboratory.

In the Museum are conveniently arranged collections of ores, minerals, and rocks from every important mining camp in the State. There are also framed photographs from the various mining regions and a large scale relief map of the State. Besides the collections, there are many specimens of minerals, rocks, and fossils from numerous American localities. Geologic products are shown, such as samples of all the different grades of clay wares and cement goods. The above collections are attractively displayed in twelve glass-top cases and sixty feet of wall case.

The Mineralogic laboratory possesses the following collections:

No. 1, the Mineral Type Collection, consisting of about 1500 characteristic and labeled specimens used by the students for the purpose of study and comparison.

No. 2, an Exhibit Collection of minerals, consisting of large and attractive specimens.

No. 3, a Working Collection of minerals, consisting of about 7000 unlabeled specimens similar to those in the Type Collection.

No. 4, a Crystal Collection, containing about 1000 natural crystal forms.

No. 5, a Crystal Model Collection, consisting of 48 large glass crystal models and about 750 smaller wooden models used by the students in the study of crystallography.

No. 6, a Blowpipe Collection, containing minerals and metals used in blowpiping.

The Petrologic laboratory contains the following collections:

No. 1, the Rock Type Collection, consisting of about 500 characteristic labeled specimens used by the student for the purpose of study.

No. 2, the Working Collection of Rocks, containing about 2000 unlabeled specimens for the use of the students in the work of petrology.

The Petrologic laboratory is also equipped with polarizing microscopes and the following collections for use in the study of petrography:

No. 1, thirty-six mineral sections for use in petrography.

No. 2, a loaned petrographic collection of over 1200 rock specimens and their respective thin sections.

DEGREE COURSE IN MINING ENGINEERING (GEOLOGY)

(Freshman and sophomore years same as for Mining Engineering)

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Hydraulics (I. E. 102).....		3
Principles of Metallurgy (Met. 431).....		2
Metallurgy of Iron and Steel (Met. 410).....		2
General Geology (Geol. 135).....	3	
Petrology (Geol. 137).....	3	
Petrography (Geol. 139).....		3
Assaying (Met. 401).....	3	
Mine Surveying (Min. 212).....		3
Field Geology (Geol. 190).....	2	
Historical Geology and Stratigraphy (Geol. 155).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/> 18	<hr/> 18

	Senior Year	Semester	
		1st	2nd
Mining Methods (Min. 224).....		3	
Mine Economics (Min. 222).....			3
Ore Dressing (Met. 425).....		4	
Economic Geology (Geol. 182).....		3	
Ore Deposits (Geol. 181).....			3
Problems in Econ. Geol. (Geol. 184).....			2
Geology of Igneous Rocks (Geol. 156).....			3
Oil Geology (Geol. 188).....		2	
Thesis		2	2
Recommended Electives		2	3
		—	—
		16	16

The following courses are offered:

111. Crystallography and Blowpipe Analysis. These subjects are preparatory to the work in Determinative Mineralogy. In Crystallography the aim is to give the student the fundamentals of the subject and to require him to become thoroughly familiar with the common crystal forms. Blowpipe Analysis is a rapid and useful method of ascertaining all, or a part, of the elements present in minerals.

Prerequisites: Chem. 100 and 101. Sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00.

112. Determinative Mineralogy. A study of the more important mineral species, special emphasis being placed upon the determination of the various minerals. The student becomes familiar with their appearance, association and uses; and is able to determine them accurately and rapidly by their physical and chemical properties.

Prerequisite: Geol. 111. Sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00.

135. General Geology. A study of the composition, structure, and history of the earth and of the forces instrumental in producing or changing the surface configuration and the crustal formation. Emphasis is given to the chief processes by which the accessible rocks of the earth have been formed and evolved into their present condition. Practice in the interpretation and construction

of geologic and topographic maps is given. A summary of the historical geology and stratigraphy of North America is also presented.

Junior year; first semester; 3 credits; 3 lectures or recitations; 1 laboratory period for School of Mines students. Elective in other courses. Fee \$1.00.

137. Petrology. A study of rocks, treating of their origin, mode of occurrence, and alteration. The course is intended to familiarize the student with the characteristics of the commoner rocks so that he may identify them in the field. Special emphasis is laid upon the numerous petrologic facts and principles which bear an immediate relation to mining operations.

Prerequisites: Geology 112 and 135. Junior year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00.

139. Petrography. A more advanced course in Petrology. The optical properties of the rock-forming minerals and the characteristics of the principal rock types are studied with the aid of thin sections and polarizing microscope. Type collections with their corresponding rock sections are available, and the student has the opportunity to supplement field determinations with the exact knowledge gained through the use of the microscope.

Prerequisite: Geol. 137. Junior year; second semester; 2 credits; (for those specializing in Geology 3 credits); 1 recitation; 2 or 3 laboratory periods. Fee \$1.00.

155. Historical Geology and Stratigraphy. Lectures on the origin and history of the earth and the plants and animals that have inhabited it. An outline of invertebrate paleontology is presented, and the student is familiarized with the principles on which is based the determination of the age of fossiliferous rocks by means of "faunal groups," and by the recognition of characteristic species. A part of the scheduled recitation periods is utilized for laboratory work.

Prerequisites: Geol. 135 and 137. Elective; first semester; 3 credits; 3 recitations.

156. Geology of the Igneous Rocks. A course designed for graduate or advanced students dealing with the origin of igneous rock bodies. Such subjects as magnetic differentiation, the mechanism of intrusive and extrusive action are discussed in detail, and special attention given to those subjects that have an important

technical bearing, such as contact metamorphism, magmatic waters, gaseous emanations, etc.

Prerequisite: Geol. 139. Elective; second semester; 3 credits; 3 recitations. Texts: R. A. Daly, *Igneous Rocks and Their Origin*. Harker, *The Natural History of Igneous Rocks*.

161. Forest Geology. The characteristics of the commoner minerals, rocks, and ores. The more important structural features of rocks and mineral deposits, and the criteria for recognizing the various types of ore deposits are studied. Practice in the interpretation of geologic and topographic maps is given to enable students to make use of these maps in the field.

Prerequisites: Chemistry 100 and 101. Required in Forestry course; optional in all others; freshman year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00.

171. Agricultural Geology. A study of the origin and nature of soils, and the geologic processes which alter the surface of the earth; the origin and occurrence of underground water; occurrence of artesian basins; the location of wells; interpretation of topographic, geologic, and soil maps; geologic occurrence and uses of mineral fertilizers and road materials.

Prerequisites: Chem. 100 and 101. Elective in Agricultural courses; junior or senior year; first semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$1.00.

181. Ore Deposits. The principles of ore deposition. Given in the second semester of the senior year in order that all of the student's previous knowledge of geologic subjects may be brought into use in the study of ore deposits. The occurrence, origin, geologic relations, and classification of ore deposits are studied. The various type deposits as known in important mining camps are discussed. The student is required to write abstracts from the literature bearing on the subject. Considerable importance is attached to the accompanying laboratory work, which consists of mineralogic and petrologic study of rocks and ores from type deposits. A certain amount of time is devoted to a discussion of field methods, mine examination, etc.

Prerequisites: Geol. 135, 137, and 182. Senior year; second semester; 3 credits; 3 recitations; 1 laboratory period. Text: Lindgren, *Mineral Deposits*. Fee \$1.00.

182. Economic Geology of the Non-Metallics. A course intended to give to the student a knowledge of the economically im-

portant non-metallic substances, such as coal, clay, building stone, etc. Geologic occurrence and origin are carefully studied, particularly those characteristics affecting economic value. The student is required to prepare many abstracts from current literature. Considerable time is devoted to individual industries, such as the manufacture of clay products and of Portland cement. Special attention is given to market conditions and the factors affecting them.

Prerequisites: Geol. 135 and 137. Senior year; first semester; 2 credits; 2 recitations; 1 laboratory period.

184. Problems in Economic Geology. Practical problems in mining and field geology are worked out by the student in the laboratory and drafting room. Geologic, topographic, and mine maps are used, and many structural problems are studied, with special regard to their application in the development of mineral deposits.

Prerequisite: Geol. 182. Senior year; second semester; 2 credits; 2 laboratory or drafting-room periods. Fee \$1.00.

186. Interpretation of Geologic and Topographic Maps. A study of the representation of geologic and topographic data on paper. Interpretation of geologic maps and cross-sections and of topographic maps. Methods of platting geologic data on engineering plans. A large number of government and other geologic and topographic maps covering varied regions of the United States are studied in detail.

Elective for all juniors and seniors in the School of Mines, School of Engineering, and School of Forestry; second semester; 2 credits; 2 drafting-room periods. Fee \$1.00.

188. Oil Geology. A course in the geology of petroleum. Required of students registered for the degree in Mining Engineering (Geology). The course includes a study of the origin, geologic occurrence, geologic structure, and distribution of deposits of petroleum and natural gas, with special reference to the oil and gas fields of the United States, Mexico, and South America. Methods of exploring for oil, and methods of mapping geologic structure are studied, as well as various methods of recording and filing geologic data bearing upon the geology of oil and gas.

Prerequisite: Geol. 135. Senior year; first semester; 2 credits; 2 lectures or recitations; 1 laboratory period. Elective for seniors in all other courses in the School of Mines.

190. Field Geology and Geologic Surveying. An application of the principles and methods of geologic surveying. Attention is given to such phases as the use of the plane table and other instruments pertaining to this work. The student is assigned a small area and is required to make a geologic map and report based upon the results of his field work. A two weeks field trip is made to some mining locality showing a variety of geologic features.

Prerequisites: Geol. 135 and 137. Elective; first semester; 2 credits; 1 recitation; 4 hours in field and laboratory.

191. Engineering Geology. A course in general and applied geology for students in the School of Engineering, emphasizing those phases of the subject with which the civil, irrigation, and highway engineer should be familiar. The origin and nature of the materials of the earth; a review of geologic processes which modify the earth's surface; occurrence and nature of geologic structural and road materials; influence of structure of rocks on engineering projects; study of ground waters and effect on water supply and foundation sites; interpretation of geologic and topographic maps; occurrence of ores and other minerals of economic value.

Prerequisites: None. Elective; open to all juniors and seniors in the School of Engineering; first semester; 3 credits; 3 recitations or lectures; 1 laboratory period. Fee \$1.00. Text: Ries and Watson, Engineering Geology.

199. Practical Geology. Students in the School of Mines are required, before the senior year, to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course being pursued. Evidence of the nature, quality, and sufficiency of this work will be passed upon by the proper department before credit is given. While the minimum requirement is two months, it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. Insight into the technical subjects studied later, also an appreciation of their application to the conditions met in practice on a commercial scale, are thus gained.

CERAMIC ENGINEERING

IRA ABRAHAM WILLIAMS, Professor

The course of instruction in Ceramic Engineering is designed to prepare young men to make intelligent search for suitable raw materials, to test them properly, and to aid in their economic exploitation and development. At the outset, therefore, ceramic students are required to take substantial courses in the basic sciences, chemistry, mathematics, physics, geology, and the preliminary engineering subjects required of other students in the School of Mines.

Work in the subjects distinctive of the course is confined to the last two years, and includes lectures and laboratory instruction and practice in the processes and methods of manufacture of ceramic wares, including, besides the commoner clay products, pottery and porcelain, and the compounding and application of glazes, enamels, cements, etc. Both the materials used and the finished articles will be studied and tested. The physical and chemical principles on which the production and value of ceramic products are based are presented thoroughly, and the student is shown that successful manufacture depends upon a full knowledge and constant application of these principles.

Equipment. The Ceramic Engineering laboratory occupies a room about 30 by 60 feet in the basement of the Mines building. There are also store and supply rooms contiguous to this laboratory. The equipment for the ceramic engineering work consists of a laboratory for ceramic chemistry and apparatus for making physical tests of clays and other ceramic materials; a complete mechanical outfit for the preparation of clays for the manufacture of brick, tile, terra-cotta, etc., and equipment for the compounding of bodies, glazes and enamels for stone- and iron-ware, and all of the higher grade of pottery and of porcelain products. This outfit includes a combination dry-wet-pan, pug mill, blunger, filter press, ball mills, and other grinding machines, rolls, screenes, potter's wheel, and an auger machine provided with dies for side- and end-cut brick, hollow block, drain tile, and roofing tile; a hand-power screw press with dies for dry press brick and flat tile; and an electric furnace for high temperature work.

In the ceramic engineering laboratory are two kilns, a down-draft, burning crude petroleum, and a Caulkins muffle pottery kiln;

a steam dryer in which drying conditions can be accurately controlled; an electric and a radiation pyrometer; Seger volumeter; balances, and other necessary apparatus.

A ceramic library, which contains the best works in both English and foreign languages, and a ceramic museum are also important features of the working equipment of the department.

DEGREE COURSE IN CERAMIC ENGINEERING

The freshman and sophomore years are identical with the first two years of the Degree Course in Mining Engineering.

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Hydraulics (I. E. 102).....		3
Electrical Machinery (E. E. 402).....		4
General Metallurgy (Met. 402).....	3	
General Geology (Geol. 135).....	3	
Petrology (Geol. 131).....		2
Ceramic Chemistry (Cer. E. 301).....	3	
Ceramic Raw Materials (Cer. E. 303).....	3	
Raw Materials Testing (Cer. E. 310).....		2
Ceramic Calculations (Cer. E. 312).....		1
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	19	17
Senior Year		
Technical English (Eng. 141).....	3	
Power equipment (Min. E. 231).....		3
General Engineering Laboratory (Exp. E. 210).....	2	
Economic Geology (Geol. 182).....	2	
Manufacture of Clay Products (Cer. E. 321).....	4	
Clay Products Laboratory (Cer. E. 322).....		3
Limes and Cements (Cer. E. 326).....		3
Glasses, Glazes, and Enamels (Cer. E. 323).....	4	
Ceramic Engineering Laboratory (Cer. E. 324).....		2
Field Work and Report (Cer. E. 328).....		1
Thesis (Cer. E. 330).....		4
	15	16

The following courses are offered:

301. Ceramic Chemistry. Analysis of clays, glasses, glazes, and silicate minerals. Chemical study of fire gases.

Prerequisites: Chem. 301 and 401. Junior year; first semester; 3 credits; 3 laboratory periods. Deposit \$5.00.

303. Ceramic Raw Materials. The occurrence, properties identification, and winning of clays and other ceramic materials.

Prerequisite: Completed work of the freshman and sophomore years. Junior year; first semester; 3 credits; 3 recitations; 3 laboratory periods.

310. Raw Materials Testing. Continuation of the laboratory work of Cer. E. 303. Lectures at intervals as required.

Prerequisites: Cer. E. 303 and Chem. E. 471. Junior year; second semester; 2 credits; 2 laboratory periods.

312. Ceramic Calculations. Calculations involved in the blending of raw materials for pottery bodies, glazes, cements, etc. Practical ceramic problems.

Prerequisites: Cer. E. 303 and Chem. E. 471. Junior year; second semester; 1 credit; 1 recitation.

321. Manufacture of Clay Products. Principles of the manufacture of clay wares, and the equipment used in drying and burning.

Prerequisite: Completion of the first three years of the Ceramic Engineering Course. Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods.

322. Clay Products Laboratory. Continuation of the laboratory work of Ceramic Engineering 321. Lectures at intervals as required.

Prerequisite: Cer. E. 321. Senior year; second semester; 3 credits; 3 laboratory periods.

323. Glasses, Glazes, and Enamels. Classification, production, properties, and defects. Methods of application to ceramic wares.

Prerequisites: Cer. E. 303 and 312; Chem. E. 471. Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods. Deposit \$2.00.

324. Ceramic Laboratory. Continuation of the laboratory work of Ceramic Engineering 323. Lectures at intervals as required.

Prerequisite: Cer. E. 323. Senior year; second semester; 2 credits; 2 laboratory periods. Deposit \$5.00.

326. Limes and Cements. Lime, cement, plaster, and other cementing materials, and sand-lime products. Production, properties, and uses.

Prerequisites: Chem. 301 and 401. Senior year; second semester; 3 credits; 3 recitations.

328. Field Work and Report. Visits to cement, clay, and other related industrial plants; carefully written reports.

Prerequisites: Cer. E. 322 and 326. Senior year; second semester; 1 credit; 1 laboratory period.

330. Thesis. A careful study of some special ceramic problem.

Prerequisite: Completion of all ceramic courses offered before the second semester of the senior year.

Senior year; second semester; 4 credits; 4 laboratory periods. Deposit \$5.00.

399. Practical Work in Ceramics. For a description of this course, see Min. E. 299.

With the consent of the heads of the departments interested, students may be admitted to the ceramic courses from the other departments in the School of Mines, and from the School of Engineering and Mechanic Arts.

SCHOOL OF PHARMACY

ADOLPH ZIEFLE, Dean
* IRWIN LEONARD BETZEL, Instructor
FRANCOIS ARCHIBALD GILFILLAN, Instructor
_____, Assistant

Success in Pharmacy depends to a great extent on what preparation one makes for his work in the formation of correct habits of economy coupled with industry. The importance of a scientific training in pharmacy cannot be overestimated. This is true both as regards the pharmacist and the public, for the dispenser of medicines must be held responsible for the purity and strength of his preparations. The necessary education for conducting a modern pharmacy cannot be secured in a drug store alone, however valuable the experience gained therein may be. It is clearly evident that suitable preparation for the life-work of the practical pharmacist can only be given to one who has the necessary practical experience, as well as the proper educational training.

State boards of pharmacy, recognizing the importance of scientific pharmaceutical training, are requiring it in addition to a definite amount of practical drug-store experience as a prerequisite for registration.

Of late years the demand for educated pharmacists has been more urgent than ever before, on account of the enactment of State and National Pure Food and Drug Laws, as well as other laws that regulate the sale of medicinal substances. For these reasons, it is necessary that pharmacists adjust themselves to public sentiment, which expects pure drugs and medicines and competent persons to manufacture and dispense them. These requirements can only be attained through pharmaceutical education.

The necessary knowledge of the sciences on which the art of pharmacy is based and the technical skill required to practice that art, are best acquired in a well-equipped school of pharmacy. From the fact that very little teaching is done in drug stores, it becomes necessary for the successful pharmacist to have college training in order accurately to prepare medicines and dispense prescriptions. Aside from this, it often becomes necessary to identify drugs, detect accidental poisoning and to determine whether drugs are fit to be used in prescription work.

* On leave of absence for service in war work.

It is this kind of training that the department of Pharmacy at the Oregon Agricultural College is prepared to give. The department is conveniently located in Science Hall and the eight rooms that are used for instruction in the strictly pharmacy subjects are very well equipped to give the proper instruction. The courses in pharmaceutical chemistry are given in the department of Chemistry which is also located in Science Hall.

One of the main objects of all young pharmacists is to pass a creditable examination before the State Board of Pharmacy. Preparation for such examinations is a special feature of the work of the department and its graduates have been most successful. Aside from enabling students to pass the pharmacy examination, however, the aim of the department is to afford an opportunity to obtain a thorough technical training that will equip the student for a life of efficient service in the profession of pharmacy from the practical point of view.

The courses of study meet the highest requirements of pharmaceutical instruction. The facilities for work are such that students who are interested can become most proficient in the manufacture and dispensing of drugs. The time spent in scientific pharmaceutical training will result beneficially for the people and to the profession of medicine in which pharmacy occupies a separate and distinct field.

Since the pharmacy curriculum requires more chemistry than any other course in the College, it is possible for students in pharmacy and special students to major in chemistry by electing the course in preparation for any position they have in mind. Graduates are constantly being sought by retail pharmacists as prescription dispensers, by manufacturing and wholesale druggists, by departments executing Federal and State Pure Food and Drug Laws, where they serve as chemists and inspectors.

Oregon is especially adapted to the cultivation of medicinal plants and it is only a question of time when the growing of drugs will prove to be a commercial enterprise for the State. The department of Pharmacy is especially fortunate in being able to give instruction along the line of drug cultivation. This is one of the features of the course in Pharmacognosy, a course in which students are taught to identify, cultivate, preserve, and understand all vegetable drugs.

Courses of Instruction. Three courses of instruction are offered; namely, Graduate in Pharmacy (Ph. G.), requiring two year's work, Pharmaceutical Chemist (Ph. C.), requiring three year's work, and Bachelor of Science in Pharmacy (B. S. Pharm.), requiring four year's work. In addition to these courses students may take work leading to the degree of Master of Science in Pharmacy.

A two-years course leading to the degree of Graduate in Pharmacy (Ph. G.) is offered, comprising the more professional studies of the curriculum. It prepares directly for drug-store and dispensing practice and provides a groundwork in analytical chemistry necessary for the drug business and the various phases of pharmaceutical manufacturing.

A three-years course leading to the degree Pharmaceutical Chemist (Ph. C.) is designed especially for those who wish to enter the commercial field of pharmaceutical chemistry, medical chemistry, or food and drug analysis. The third year is devoted to advanced subjects not given in the two-years course. Graduates of this course specializing in bacteriology and chemistry are eligible to the Sanitary Corps of the United States Army, where they become commissioned officers after taking the courses of instruction.

By electing special courses such as physics, modern language, and biology, students electing the three-years course can complete all important courses in Pharmacy and Chemistry as well as all pre-medical work required for entrance in all schools of medicine. Those of our graduates who have become practicing physicians are unanimous in declaring that their course in Pharmacy has been of great value to them in their medical practice.

Although it is impossible to publish an outline of the three-years course in this issue of the College catalogue, a complete outline will be printed in the bulletin of the School of Pharmacy published at a later date which may be had on request.

Certain courses such as quantitative inorganic chemistry, bacteriology, and physiological chemistry will be required. Students will be allowed the privilege of electing such other courses as will fit them for the kind of work they wish to take up after graduation.

A four-years course is academic and professional, leading to the degree of Bachelor of Science (B. S.). This is the most satisfactory course to elect, because it gives a broad collegiate training supplemented with the professional work of the two-years course. This course also includes thorough work in Bacteriology, Zoology,

Botany, Food and Drug Chemistry, and Physiological Chemistry. Many students who have completed the work of this degree have continued their study in schools of medicine. The entrance requirements for the above courses are the same as for other degree courses of the College.

Students Not Candidates for Degrees. The facilities of the School of Pharmacy are not denied to those drug clerks and students who cannot meet the entrance requirements in the courses leading to the above degrees. Such students will be admitted as specials, not candidates for degrees, upon approval of the Dean and Registrar.

Students preparing to study Chemistry, Dentistry or allied subjects will find the course in Pharmacy especially well adapted for entrance to professional schools. Arrangements can be made whereby the student may elect such courses from the curriculum as are necessary to meet certain requirements.

Admission of advanced students: Students entering from collegiate departments of other colleges and universities must bring a certificate of honorable dismissal. Upon presentation of the proper credentials they will receive advanced credit for courses taken in institutions whose entrance requirements and character of work are equivalent to those of this department.

Equipment. The department's lecture rooms and laboratories are in Science Hall, a building which conveniently meets the needs for space, light, and ventilation.

The laboratories and lecture rooms are well equipped with all requirements necessary for practical instruction in pharmaceutical manipulation. Each laboratory is thoroughly equipped for a definite kind of work and the stock of the department is so complete that students have every opportunity to do efficient work. Students have individual desks supplied with a complete set of apparatus. Nearly all stock used by students is found on side shelves directly in the laboratory. All drugs not found on side shelves are obtained from the stock which is in charge of an assistant at all times during laboratory periods. This system for the distribution of drugs and apparatus to students works for the highest efficiency. Much of the student's time is saved thereby.

In addition to the usual permanent fixtures and apparatus for individual students, the department is supplied with a number of pieces of special apparatus for common use, such as pharmaceutical

still, tablet and pill machines, suppository machines, filter presses, and all of the apparatus that is necessary for thorough instruction in pharmacy. The prescription room is really a model drug store, containing accurate balances, capsule fillers, conical molds, and such other apparatus as is necessary. The room for commercial pharmacy is equipped for sign-card painting and window dressing. Special tables for frames have been built for the work and each desk is supplied with compressed air for work with the air brush. The pharmacognosy room contains many cabinets filled with crude drugs, active principles, and many preparations. There is also the Eli Lilly & Co. exhibit of authentic crude drugs and preparations.

The pharmacy library contains the leading pharmaceutical journals, which are kept on file and are accessible to students. Students also have access, with certain restrictions, to all standard reference books on materia medica, chemistry, and pharmacy.

DEGREE COURSE IN PHARMACY

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 105, 106).....	5	2
Qualitative Analysis (Chem. 300).....		3
General Zoology (Zool. 101, 102).....	3	3
Pharmaceutical Botany (Bot. 70, 71).....	3	4
Elementary Pharmacy (Phar. 102, 103).....	1	1
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....	$\frac{1}{2}$	
	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Sophomore Year		
Organic Chemistry (Chem. 201, 202).....	3	3
Quantitative Analysis (Chem. 400).....	4	
Zoology (Zool. 201, 202).....	3	3
Pharmaceutical Latin (Phar. 104).....	2	
Modern Language (French, German, or Spanish).....	3	3
Principles of Economics (Com. 210).....		3
Business Law (Com. 311).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	16 $\frac{1}{2}$	16 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year		
Theoretical Pharmacy (Phar. 116).....	3	
Pharmacy Bacteriology (Bact. 201, 202).....	3	3
Modern Language	3	3
Practical Pharmacy (Phar. 117).....		3
Pharmaceutical Preparations (Phar. 118).....		2
Pharmacognosy (Phar. 130, 131).....	3	2
Inorganic Pharmacy (Phar. 121).....	3	
Alkaloidal Testing, Drug Assaying (Chem. 404, 405).....	2	2
Pharmaceutical Calculations (Phar. 123).....		2
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
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	18	18

Senior Year

Composition of Addresses (Eng. 103, 104).....	2	2
Materia Medica and Toxicology (Phar. 140, 141).....	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115).....	3	3
Food and Drug Analysis (Chem. 304).....	3	
Prescription Lectures (Phar. 150).....	3	
Prescription Incompatibilities (Phar. 151).....		3
Prescription Compounding (Phar. 152).....		2
Manufacturing Pharmacy (Phar. 170).....	2	
Physiological Chemistry (Chem. 409).....		3
	—	—
	16	16

TWO-YEARS COURSE IN PHARMACY *

	Semester	
	1st	2nd
General Chemistry (Chem. 105, 106).....	5	2
Qualitative Analysis (Chem. 300).....		3
Pharmaceutical Latin (Phar. 104).....	2	
Inorganic Pharmacy (Phar. 121).....	3	
Pharmacognosy (Phar. 130, 131).....	3	2
Theoretical Pharmacy (Phar. 116).....	3	
Practical Pharmacy (Phar. 117).....		?
Pharmaceutical Preparations (Phar. 118).....		2
Pharmaceutical Calculations (Phar. 123).....		2
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Elective		2
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

* This course leads to the degree of Graduate in Pharmacy. Students entering the course must have completed the full four-years high-school training.

Second Year

Organic Chemistry (Chem. 201, 202).....	3	3
Materia Medica and Toxicology (Phar. 140, 141).....	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115).....	3	3
Prescription Lectures (Phar. 150).....	3	
Prescription Incompatibilities (Phar. 151).....		3
Prescription Compounding (Phar. 152).....		2
Manufacturing Pharmacy (Phar. 170).....	2	
Alkaloidal Testing, Drug Assaying (Chem. 404, 405).....	2	2
Drill (Military 3, 4).....	1	1
	<hr/> 17	<hr/> 17

The following descriptions are for the strictly pharmacy subjects, all courses in pharmaceutical chemistry are outlined in the chemistry schedule.

The following courses are offered:

102. **Elementary Pharmacy.** This course deals with: history of pharmacy and its development, standard pharmaceutical literature, demonstration of apparatus, and other elementary phases of

pharmacy. The aim of the course is to give new students an idea of the subject by showing the relation of the various scientific courses in the pharmacy curriculum to each other.

Freshman year; first semester; 1 credit; 1 lecture. Text: Stevens, Pharmacy.

103. Elementary Pharmacy. A continuation of course 102 but deals with more advanced subjects in preparation for the courses in Pharmaceutical Latin and Theoretical Pharmacy.

Prerequisite: Phar. 102. Freshman year; second semester; 1 credit; 1 lecture. Text: Stevens, Pharmacy.

104. Pharmaceutical Latin. Latin is the language of science and all properly trained pharmacists need some knowledge of the principles of Latin etymology and construction in order to understand the use and terminology of pharmacy and medicine. The following subjects are made the basis of systematic study in this course: Latin abbreviations as used by physicians, Latin endings of drugs and medicines, prescription Latin, and English translation of all Latin terms used in pharmacy.

Sophomore year; first semester; 2 credits; 2 recitations. Text: Sturmer, Pharmaceutical Latin.

114. United States Pharmacopoeia and National Formulary. The object of this course is to apply the principles of all fundamental scientific courses such as, chemistry, materia medica, pharmacognosy, etc., to the subject of pharmacy. The Pharmacopoeias, Dispensatories, and National Formulary are the text-books used, and students are required to become very well informed as to the composition, uses, and methods of preparation of all official and unofficial remedies, as well as those newer remedies that are used most frequently. All strictly pharmacy courses are reviewed in preparation for the State Board of Pharmacy examination. Several intermediate examinations will be held, and the instructors will thus be enabled, by returning proper suggestions and directions, to aid students materially in equipping themselves for any pharmacy examination. Typical representative State Board questions will be used as a guide in preparing for the examination. There will be frequent reviews in identification of drugs and their preparations, as well as the careful systematization of all pharmacy subjects to permit of frequent reviews.

Prerequisites: Phar. 117, 118, Chem. 300, 201, 202. Senior year; first semester; 3 credits; 3 recitations. Text: U. S. Pharmacopoeia and National Formulary.

115. United States Pharmacopoeia and National Formulary.

This is a continuation of course 114. As a special feature of the work, however, all scientific journals and state bulletins are reviewed, in order to familiarize students with the trend of State and National Pure Food and Drug work, as well as the various laws regarding the sale of drugs. The newer remedies are studied from the point of view of their composition, use, and incompatibilities. Other subjects of equal importance are discussed, the aim of the work being to prepare students for the actual needs in pharmacy.

Prerequisite: Phar. 114. Senior year; second semester; 3 credits; 3 recitations. Texts: U. S. Pharmacopoeia and National Formulary.

116. Theoretical Pharmacy. This course will begin with lectures defining pharmacy and allied sciences, and will embrace a study of the nomenclature of Pharmacopoeias and their importance as standard for drugs. Then will follow in order, lectures and demonstrations dealing with the principal processes employed in operative pharmacy; viz, weights and measures, heat, distillation, sublimation, extraction in its various forms, and other methods used in the manufacture of galenical preparations.

Prerequisites: Registration in Chem. 105 and Phar. 130. Junior year; first semester; 3 credits; 3 recitations. Text: Army, Principles of Pharmacy.

117. Practical Pharmacy. The natural products used in pharmacy are carefully defined and demonstrated. Then follows a study of the various classes of preparations such as: waters, sirups, tinctures, extracts, etc. Each class is defined and the various methods used in their preparation are illustrated and discussed. All preparations of the U. S. Pharmacopoeia are studied, particular attention being given to their constituents, percentage strength, method of preparation and reasons for each step, equations and synonyms.

Prerequisites: Phar. 116, Chem. 105. Junior year; second semester; 3 credits; 3 recitations. Texts: Army, Principles of Pharmacy. Ruddiman, Why's in Pharmacy.

118. Pharmaceutical Preparations. The object of this course is to teach students to put into practice the principles of Theoretical Pharmacy. While the student's work is individual, constant supervision of the instructor prevents inaccuracies and error in conception, and in this way wrong methods can be corrected. The

work will embrace the determination of specific gravities by various methods, comparison of weights and measures, standardization of graduates and the tying and wrapping of carefully weighed packages. The main feature of the course, however, is accurately to prepare small amounts of the simpler preparations such as: waters, liquors, emulsions, pills, suppositories, etc.

The galenicals made are carefully inspected and at definite times identification examinations are held, at which time students are required to identify all preparations made and all ingredients used in their manufacture.

Prerequisites: Registration in Phar. 117 and Chem. 105. Junior year; second semester; 2 credits; 2 three-hours laboratory periods. Text: U. S. Pharmacopoeia. National Formulary. Laboratory Notes. Fee \$6.00. Deposit \$1.00.

121. Inorganic Pharmacy. This course deals with a study of official and unofficial inorganic drugs. The lecture work consists of a study of the elements and their compounds that are used in medicine. Their source, method of preparation, formulae, synonyms, physical and chemical characteristics are made the basis of systematic study. In the laboratory representative samples of each type of chemical will be made and samples of all official inorganic drugs will be supplied to each student for identification study.

Prerequisites: Registration in Phar. 116 and Chem. 105. Junior year; first semester; 3 credits; 2 lectures and 2 two-hours laboratory periods. Text: Army, Principles of Pharmacy. Fee \$4.00.

123. Pharmaceutical Calculations. The various forms of calculations that are common to pharmacy are made the subject of systematic study; viz., equivalents of each system of weights and measures, calculation of proportionate parts of a formula, percentage solutions, specific gravity, alligation, and such chemical calculations as are met with in pharmacy.

Prerequisites: Phar. 116, Chem. 105. Junior year; second semester; 2 credits; 2 recitations. Text: Stevens, Pharmaceutical Arithmetic.

130. Pharmacognosy. This course deals with the macroscopical examination and study of official and unofficial animal and vegetable drugs. All drugs are properly classified in respect to their habitat, botanical order, constituent, synonyms, medicinal uses, and preservation. Frequent identification examinations are

given so that students must become thoroughly familiar with the physical characters of drugs as well as their use.

Prerequisites: Registration in Phar. 104, 121, 116. Junior year; first semester; 3 credits; 3 recitations. Texts: Culbreth, *Materia Medica*. Schlotterbeck, Syllabus. Lilly, *Organic Drugs*. Fee \$1.00.

131. Pharmacognosy. A continuation of course 130 and the use of typical State Board of Pharmacy questions to supplement the work in preparing to become registered pharmacists. A special feature of the work of this course is the instruction in growing drugs on a commercial scale. Lectures and demonstrations will be given on preparation of soil, planting of seed, the care of drug plants, collection and preparation for market.

Prerequisite: Phar. 130. Junior year; second semester; 2 credits; 2 recitations. Texts: Culbreth, *Materia Medica*. Schlotterbeck, Syllabus. Lilly, *Organic Drugs*. Fee \$1.00.

140. Materia Medica and Toxicology. Lectures and recitations on the properties, physiological actions, uses, and doses of all chemical, animal, and vegetable drugs, and their preparations. The different types of drugs are studied in groups according to their physiological action. The peculiar terms used to classify drugs according to their action and uses are carefully defined. The subject of toxicology receives especial attention from the point of view of absorption, elimination, and cumulative action of poisonous substances. The signs and symptoms are studied in each case, and the antidote and medicinal treatment receive attention.

Prerequisites: Phar. 117, 118, and Chem 201, 202. Senior year; first semester; 3 credits; 3 recitations. Texts: Tyrode, *Pharmacology*. Stearns, *Dose Book*. Fee \$1.00.

141. Materia Medica and Toxicology. A continuation of course 140. After the entire subject has been covered, preparation for the State Board of Pharmacy examination and the practical use of the subject follows. Each student will be required to familiarize himself with State pharmacy and drug laws, as well as other laws that regulate the manufacture and sale of drugs. The latter part of the course consists of lectures and laboratory work on First Aid to the Injured. Pharmaceutical jurisprudence is considered from the point of view of the trend of recent legislation affecting pharmacists, legal limits of pharmacy, liability of the seller of drugs, expert witness and all other phases of this subject.

Prerequisite: Phar. 140. Senior year; second semester; 3 credits; 3 recitations. **Texts:** Tyrode, Pharmacology. Stearns, Dose Book. Fee \$1.00.

150. Prescription Lectures. This course deals with the technical study of all phases of the prescription. It embraces particularly the very important subject of pharmaceutical, chemical, and therapeutical incompatibilities. The aim of the course is to give such theoretical instruction as will enable the student to devise the best method of compounding prescriptions in order that the mixture will be safe and represent what the physician wants. Each class of prescriptions is studied, particular attention being given to the art of preparing elegant remedies. Ambiguous prescriptions are read in class, and the question of overdose of such drugs that might prove to be poisonous is also studied.

Prerequisites: Phar. 117, 118; Chem. 300, 201, 202. Senior year; first semester; 3 credits; 3 recitations. **Text:** Scoville, Art of Compounding.

151. Prescription Incompatibilities. This is a continuation of course 150, the chief subject being that of incompatibilities. Several hundred different prescriptions are studied from the point of view of compounding the various ingredients of remedies in the best sequence. The literature is carefully abstracted in order that students may become familiar with the manner of compounding the newer remedies that are not found in Pharmacopoeias. The aim of the work of this course is to teach students to detect dangerous prescriptions and to overcome incompatibilities.

Prerequisite: Phar. 150. Senior year; second semester; 3 credits; 3 recitations. **Text:** Ruddiman, Incompatibilities in Prescriptions.

152. Prescription Compounding. In this course students are expected to apply the principles of Prescription Lectures to the actual compounding of prescriptions. Many difficult and obscure prescriptions are submitted to students, who are called upon to deal with them as they deem best. In this way their ability as well as their knowledge is tested and if not accurate is corrected at once. The work of this course also deals with all the details of managing the prescription counter. The latter part of the course deals with perfecting of formulas for toilet preparations. Instruction is also given in the repair and making of mirrors, repair of apparatus, and other necessary operations common to a pharmacy.

Prerequisites: Phar. 150, 151; Chem. 201, 202, 300. Senior year; second semester; 2 credits; 2 three-hours laboratory periods. Text: Scoville, Art of Compounding. Fee \$6.00. Deposit \$1.00.

160. Commercial Pharmacy. The aim of this course is to give students an idea of the requirements of an efficient manager of a pharmacy. Regular topics relating to the commercial phase of pharmacy are discussed, such as planning and arrangement of a pharmacy, keeping up stock, salesmanship, window trimming, etc. A special feature of the course is the work in sign-card painting including extensive work with the air brush. For students not registered in the department the work is exclusively sign-card painting.

Elective; first semester; 3 credits; 1 recitation and two laboratory periods. Fee \$3.50.

161. Commercial Pharmacy. A continuation of course 160 with the added feature of taking of inventory, price lists, study of druggists sundries, side lines and air brush work. At definite times during the course successful business men will deliver lectures on the commercial side of pharmacy. For students not registered in the department, the work is exclusively sign-card painting.

Elective; second semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$3.50.

170. Manufacturing Pharmacy. This course is a continuation of the course on Pharmaceutical Preparations and deals with the manufacture of the more difficult pharmaceuticals that involve chemical reactions. The work is most exacting and requires a thorough knowledge of chemistry. As examples of the kind of preparations made, the following are mentioned; viz., spirits of nitrous ether, iodoform, ferrous iodide preparations, etc.

Prerequisites: Phar. 117, 118. Senior year; first semester; 2 credits; 2 three-hours laboratory periods. Text: U. S. Pharmacopoeia. Fee \$6.00. Deposit \$1.00.

SCHOOL OF VOCATIONAL EDUCATION

EDWIN DEVORE RESSLER, Dean

The chief function of the School of Vocational Education is to train teachers for the following vocations: agriculture, commerce, home economics, and the trades and industries. The School also offers opportunities for all teachers and students in the College to secure professional improvement with regard to teaching and related lines of service such as extension work.

There is a special demand at this time for vocational teachers who are able to meet the standards set by the State Board for Vocational Education to meet the requirements of the Smith-Hughes Act. Teachers meeting these requirements, and securing positions under direction of the State Board, receive one-half their salaries from Federal funds. The School of Vocational Education has been designated by the Board to receive Federal funds for the training of such teachers.

In the training of teachers for these vocations, emphasis must be placed upon the acquiring of technical knowledge and the development of skill; hence it is necessary for students to secure such training in the School that represents the field in which they are intending to teach. Inasmuch as this training will constitute the major portion of an under-graduate course, it is necessary for students to register and take their degrees in the school representing the subject they will teach. Prospective teachers of agriculture will take an agricultural course with their major in agricultural education; of home economics, a course in home economics with home economics education as a major; of commercial subjects, a commercial course with their major in commercial education; if manual training, the course in industrial arts.

Since the Institution does not give training for all of the trades and industries, it will be necessary at the present time for the department of Industrial Education to bend a great deal of its effort in the direction of giving professional training to teachers in service and to men and women who have acquired knowledge and developed skill in the trades they propose to teach.

Graduate Courses. Graduates of any school in the Institution who have majored in any phase of vocational education, or graduates of this or any other standard college who have established a pro-

fessional status in vocational education, may take graduate courses leading to the degree, Master of Science, in the particular lines of vocational education in which they may take their major work. Graduate courses will be arranged and directed by the professor in charge of the major work under the Committee on Graduate Students and Advanced Degrees.

Teaching as a Profession. Students are advised to consider carefully the selection of teaching as a vocation. Good scholarship and the ability to speak, spell, and write the mother tongue correctly are fundamental essentials. Personality, altruism, enthusiasm, professional aptitude, and above all, moral character, are demanded of the teacher. Positions cannot be guaranteed and none but capable candidates will be recommended.

The Oregon School Law grants a high-school teaching certificate to graduates who have taken fifteen credits in education. Students preparing as vocational teachers under the Smith-Hughes Act should become familiar with the State requirements for teachers of the particular vocation they are intending to teach.

EDUCATION

EDWIN DEVORE RESSLER, Professor
JESSE FRANKLIN BRUMBAUGH, Assistant Professor

This department gives general courses in education upon which courses in special methods are based. Elective courses in education are open to all students prepared to take them.

The following courses are offered:

100. Principles of Education. An introduction to the study of education, including a discussion of the meaning of education, its significance in the development of the race, its aims, its method, its functions; brief description of present foreign systems and a fuller account of our own; organization of the school, relations and duties of pupils, teachers, supervisors, and school board; problems of school management; conduct of classes and general method; all with particular reference to the special, vocational teacher.

Required of all students preparing to teach; junior year; either semester; 3 credits; 3 recitations.

110. Vocational Education. Arranged to meet the needs of those preparing to teach any phase of vocational education. History of vocational education; its function in a system of education; development in the United States; present status with special regard to the requirements of Federal aided schools and departments as provided by the Smith-Hughes Act.

Prerequisites: Ed. 100. Psy. 220. Required of all seniors in Vocational Education; either semester; 2 credits; 2 recitations.

111. Vocational Guidance. An investigation of the means and methods of assisting the pupils of the upper grammar grades and high school in studying the problem of their future vocations. Factors of individual aptitude, heredity, and other personal characteristics; means of discovering these factors through school and other agencies; studies of occupations with essential qualifications for success in leading types; value of "life career" motive in education; survey of state and local resources as guides to choice, etc. Lectures, reports on the extensive literature of vocational guidance and some practical experience with pupils, under the careful supervision of the instructor.

Elective for juniors and seniors; second semester; 2 credits; 2 recitations.

120. History of Education. A general review of the growth and development of education and its relation to the civilization of the times; particular attention given to the rise of industrial education in Europe and America, and its place in the social and political life of the country.

Sophomore or junior year; either semester; 3 credits; 3 recitations.

130. School Administration. A discussion and analysis of the American system of education, with an interpretation of the purpose and spirit of each division; problems of administration and teaching in the public schools; the correlation of the industrial branches with the other subjects in the curriculum. Lectures, reading, reports, and studies on the Oregon schools.

Prerequisites: Psy. 200. Ed. 100. Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

131. School Hygiene. A course in the health provisions requisite for the hygienic conduct of education. This includes a discussion of ventilation, heating, light, seating, physical exercise in the school room and on the playground, games, medical inspection, tests for physical defects, disinfection, quarantine, and other similar topics. Oregon laws relating to these matters will be studied, and the regulations of the State Board of Health and other State and local health authorities will be explained in detail. Advanced investigations in other states will also be presented and comparative studies made. Lectures, reports, and first-hand investigations on town and country school conditions, so far as practicable.

Prerequisites: Psy. 200. Ed. 100. Elective for advanced or graduate students; first semester; 2 recitations; 2 credits.

150. Research. Advanced or graduate students who are qualified by previous training or experience, may register for extended investigation of some specific problem in vocational education. The studies may be historical, either European or American; administrative; or in field of method. General government and state reports; publications by special commissions; reports of committees of educational organizations; contributions by departments of colleges and universities; educational and other periodicals; and original investigations into Oregon conditions, compose the material to be used. These studies will be assigned and outlined by the in-

structor and stated reports made from time to time by the student. Regular hours will be assigned the individual students and credit given according to the amount of work done.

Prerequisites: Psy. 200. Ed. 100. Elective for advanced or graduate students; first semester; 2 credits.

151. Research. Continuation of course 150.

Prerequisites: Psy. 200. Ed. 100. Elective for advanced or graduate students; second semester; 2 credits.

152. Research. As outlined in course 150.

Elective for advanced or graduate students; first semester; 4 credits.

153. Research. Continuation of course 152.

Elective for advanced or graduate students; second semester; 4 credits.

PSYCHOLOGY

JESSE FRANKLIN BRUMBAUGH, Assistant Professor

This department gives the foundation courses in psychology upon which the courses in education are built. Elective courses in psychology are also open to all students in the Institution prepared to take them.

The following courses are offered:

200. General Psychology. A study of general psychology by lectures, recitations, and reports; a description of the facts and laws of mental activities with applications to the ordinary affairs of life; demonstrations and experiments showing the relation of mental life to the nervous system; the significance of habit in conduct and character.

Required of all students preparing to teach. Junior year; either semester; 3 credits; 2 recitations; 1 laboratory period.

210. Educational Psychology. The application of the facts and principles of psychology to teaching; a study of the growth of the child mind and the relations of the various periods of educational organization; adaptation of courses of instruction, methods of teaching, discipline, and general school activities to the stages of the pupil's development; lectures, recitations, reports, and simple investigations.

Prerequisite: Psy. 200. Required of all students preparing to teach. Junior year, second semester; or senior year, first semester; 2 credits; 1 recitation; 1 laboratory period.

220. Vocational Psychology. This course is based upon such principles of general psychology as lead to further application of psychological laws to the active pursuits of life. It will cover the field of habit in relation to skill and economy, perception in relation to accuracy in space discrimination, color, weight, shape, and tactile sensations, motor response in relation to stimulation, co-ordination, and inhibition. The psychology of business as it develops in the relation of man to man, of trust and faith in human affairs and modes of activity, etc. This course is intended to furnish a foundation for courses in Vocational Education to follow.

Required of all students preparing to teach vocational subjects; junior year; either semester; 3 credits; 3 recitations.

230. Child Study. This includes the physical and mental characteristics of children and youth as contrasted with those of mature men and women. The relation of physical growth and development to the unfolding of mental powers; the instincts and their relation to the development of individuality, sense of responsibility to others, moral development, etc.; abnormalities; study and treatment of children as individuals and in class groups; and discussion of the social and economic implications as well as the psychological. Lectures, reports, and simple tests and records made by visitation of schools.

Prerequisites: Psy. 200, 210. Ed. 100. Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

AGRICULTURAL EDUCATION

HARRY PERCY BARROWS, Professor
PAUL VESTAL MARIS, Professor (Ext.)
WALTER KOENIG, Instructor

The function of this department is to train men and women as teachers of agriculture in the colleges and secondary schools; to train extension workers in agriculture, and to develop leadership in rural life and education. For the purpose of training teachers of vocational agriculture as provided by the Smith-Hughes Act and for training extension workers under the Smith-Lever Act the following general courses are offered:

COURSES IN AGRICULTURAL EDUCATION

For the prescribed courses in the freshman and sophomore years in the School of Agriculture, consult pages 79-80.

Junior Year	Semester	
	1st	2nd
Vocational Psychology (Psy. 220).....	3	
Principles of Education (Ed. 100).....		3
Rural Sociology (Econ. 252).....		3
Agricultural Economics (Com. 219).....	3	
Weeds and Poisonous Plants (Bot. 69).....		3
Introductory Entomology (Ent. 301).....	2	
Economic Entomology (Ent. 302)		2
Elementary News Writing (Eng. 301).....	2	
Diseases of Live Stock (Vet. Med. 14).....		3
Shop Drawing (Ind. Arts 301).....		2
Manual Training (Ind. Arts 103).....	2	
Blacksmithing (Ind. Arts 153a).....	2	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives in Agriculture.....	2	
	—	—
	18	18

Senior Year	Semester	
	1st	2nd
Vocational Education (Ed. 110).....	2	
Secondary Education in Agriculture (Agri. Ed. 300, 301)	2	2
Practice Teaching in Secondary Agriculture (Agri. Ed. 320)		3
Farm Management (Soils and Farm Mgt. 1)		3
General Farm Mechanics (Farm Mech. 1).....	3	
Practical Public Speaking (Eng. 105, 106).....	3	3
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Electives in Agriculture	5	4
	—	—
	18	18

The following courses are offered:

300. Secondary Education in Agriculture. The principles of education as applied to the teaching of vocational agriculture in secondary schools. Aims, methods, and materials as adapted to the practical training of students over fourteen years of age are considered; including the organization of courses, the collection and use of illustrative and reference materials, and the various phases of class-room and laboratory instruction. Special emphasis is given the supervision of practical work upon the farm.

Prerequisites: Psy. 220. Ed. 100, 110. Required of all seniors in Agricultural Education; 2 credits; 1 recitation; 1 laboratory period.

301. Secondary Education in Agriculture. Continuation of course 300.

Prerequisites: Psy. 220. Ed. 100, 110, Agri. Ed. 300. Required of seniors in Agricultural Education; 2 credits; 1 recitation; 1 laboratory period.

320. Practice Teaching in Secondary Agriculture. Required of seniors in Agricultural Education; second semester; 3 credits; 3 double periods.

321. Practice Teaching in Secondary Agriculture. Facilities will be afforded students in agricultural education to extend the amount of practice teaching required in course 320.

Elective to seniors and graduates in Agricultural Education. Time and credit to be arranged.

350. Seminar in Agricultural Education. A discussion of special problems in the teaching of agriculture and in the administration of agricultural education which will be brought out in an effort to keep in touch with the progress of this phase of education. The seminar includes also a critical review of the current literature of the subject.

Required of graduate students in Agricultural Education. Elective for seniors in Agricultural Education. First semester; time and credit to be arranged.

351. Seminar in Agricultural Education. Continuation of course 350.

Required of graduate students and elective for seniors in Agricultural Education; second semester; time and credit to be arranged.

360. Educational Resources of the Rural Community. The special aim of this course is to prepare teachers for broader social service. The rural school, the farm home, the country church, farmers' organizations and other agencies for rural progress will be considered with a view of working toward a better correlation and a greater cooperation in effort for rural development. Special emphasis will be given the rural school as a community center.

Elective for seniors in any of the branches of industrial education; second semester; 2 credits; 2 recitations.

361. Extension Methods in Agriculture. The history, organization and methods of county agricultural agent work. Lectures, assigned readings, and practice in news writing, outlining program of work, drawing projects, chart making, conducting meetings, etc.

Elective to seniors in all agricultural courses; second semester; 2 credits; 2 recitations.

HOME ECONOMICS EDUCATION

AVA BERTHA MILAM, Dean of Home Economics
BERTHA DAVIS, Assistant Professor
LURA KEISER, Critic Teacher, Household Science
BARBARA MOORE, Critic Teacher, Household Art

The function of this department is to give professional training to prospective teachers and extension workers in home economics.

For the four-years courses leading to a degree in Home Economics see pages 311-313.

The following courses are offered:

400. Secondary Education in Home Economics. The principles of education as applied to the teaching of vocational home economics in secondary schools. Aims, materials, and methods as adapted to the practical training of students over fourteen years of age. Organization of courses and the various phases of class-room and laboratory instruction. Special emphasis will be given the supervision of practice work in the home.

Prerequisites: Psy. 220, Ed. 100. Required of seniors in Home Economics Education; either semester; 3 credits; 2 recitations; 1 two-hours laboratory period.

410. Survey Course in Home Economics. This is a survey course in the teaching of Home Economics to be given either after or parallel with Practice Teaching.

One recitation; 1 credit.

420. Practice Teaching in Household Art.

Prerequisites: Ed. 100. Psy. 200. H. E. Ed. 400. Required of seniors in Home Economics Education preparing to teach Household Arts; either semester; 3 credits.

430. Practice Teaching in Household Science.

Prerequisites: Ed. 100. Psy. 220. H. E. Ed. 400. Required of seniors in Home Economics Education preparing to teach Household Science; either semester; 3 credits.

INDUSTRIAL EDUCATION

FRANK HENRY SHEPHERD, Associate Professor
AMBROSE REUBEN NICHOLS, Critic Teacher

This department serves in directing the technical training of and in giving professional training to teachers of the trades and industries, manual training, and industrial arts. Since the Institution does not give training for all of the trades and industries, this department is bending a great deal of its effort in the direction of giving professional training to teachers in service and to men and women who have acquired knowledge and developed skill in the trades they expect to teach. Courses are given in Portland as well as in Corvallis. Those who are contemplating training for teaching the trades and industries should make inquiry concerning the particular line in which they may be interested. The Institution is prepared at the present time to give training in the following trades: printing, plumbing, foundry work, blacksmithing, carpentry, cabinet making, and machine-shop practice.

The following outline of a course in printing for teachers of that trade is a typical teachers-training course in this department.

TEACHER'S COURSE IN PRINTING

Freshman Year	Semester	
	1st	2nd
Modern English Prose (Eng. 81).....	3	
Technical Business English (Eng. 142).....		3
Practical Printers' Arithmetic (Math. 25).....	3	
Chemistry (Chem. 100, 101 to be arranged and applied)....	3	3
Art (Art 411)		3
Vocational Printing	5	5
Library Practice (Libr. 1).....		½
Physical Education (Phys. Ed. 11) for Men.....	½	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	½	½
	<hr/> 16	<hr/> 16

	Semester	
	1st	2nd
Sophomore Year		
Elementary News-Writing (Eng. 301).....	3	3
Engineering Physics (Phys. 1, 2).....	3	3
Physics (Phys. 1, 2).....		3
Farm Power Machinery (Farm Mech. 3).....		3
Typewriting (Com. 410).....	2	
Bookkeeping (Com. B).....		3
Vocational Printing	5	5
Shop Drawing (Ind. Arts 301).....	2	
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$

Junior Year

Advanced News-Writing (Eng. 302).....	3	3
Vocational Psychology (Psy. 220).....	3	
Principles of Education (Ed. 100).....		3
Vocational Printing	5	5
Vocational Education (Ed. 110).....	2	
Elementary Industrial History (Com. K).....	3	
Labor Problems (Com. 213).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives		2
	<hr/> 18	<hr/> 18

Senior Year

English (Campus Publications).....	3	3
Special Method in Industrial Education (Ind. Ed. 500)....	2	
Practice Teaching in Industrial Education (Ind. Ed. 501)		3
Vocational Printing	5	5
Business Law (Com. P).....	3	
Elementary Industrial Problems (Com. J).....	3	
Extempore Speaking (Eng. 104).....		3
Approved Electives	2	4
	<hr/> 16	<hr/> 18

The following courses are offered:

500. Special Method in Trades and Industries. This course deals with the organization, administration, and teaching of industrial subjects to conform to the requirements of the Smith-Hughes Act. An investigation into the values of different elements of selected trades or industries will be made for the purpose of arranging a well-balanced course of study and preparing a systematic program for the different classes. Plans for the school year, the semester or term, the project or job, and the lesson will be discussed. Time cards, job cards, blank forms, records, reports, and class records will be arranged for different lines of work to familiarize the student with up-to-date methods in modern shops and factories and to conform to the school law. Lectures, readings, discussions, and written reports.

Prerequisite or parallel course: Education 110 or its equivalent. Required of all seniors preparing to teach a trade or industry; first or second semester; 2 credits; 2 recitations.

501. Practice Teaching in Trades and Industries. The student will be required to arrange and submit definite plans and outlines of the subject, job, or lesson to be taught. Reports to the director, supervisor, or critic teacher will be made for the purpose of perfecting the student teacher in the technique of the trade of teaching. Teachers' meetings will be held at regular intervals for the discussion of class-room problems.

Prerequisites: Psy. 220. Ed. 100. Ind. Ed. 500. Required of all seniors preparing to teach a trade or industry; second semester; 3 credits.

510. Special Methods in Manual Training. A careful, detailed study of the public school course in Manual Training in its various relations. Model courses for both elementary and secondary grades are outlined with plans for desired equipment for shop and class-room. Lessons on typical subjects, observation and model lessons and practice teaching provide opportunity to apply principles to practice.

Prerequisites: Py. 220. Ed. 100. Industrial Arts; junior year; second semester; or senior year, first semester; 2 credits; 2 recitations.

511. Practice Teaching in Manual Training. Required of seniors in Industrial Arts.

Prerequisites: Psy. 220. Ed. 100. Ind. Ed. 510. Industrial Arts; senior year; first or second semester; 3 credits; 1 recitation; practice teaching.

512. Theory and Practice of Elementary Manual Arts. A course for supervisors who must arrange courses and supervise industrial arts in the lower grades. Investigation of the present trend of the manual arts movement; arrangement of a suggestive course of study; plan of equipment; ordering of supplies, etc.; sand-table projects, rug weaving, paper folding, thin wood work, and other forms of construction work for the first six grades of elementary school. Lectures, assigned readings, reports, and practical shop work.

Required in Industrial Arts; elective in other courses; junior or senior year; either semester; 2 credits; 1 recitation; 1 laboratory period.

COMMERCIAL EDUCATION

ELMER WALKER HILLS, Assistant Professor

The function of this department is to give professional training to prospective teachers of commercial subjects. Although the special courses now outlined are limited, opportunity will be afforded graduate students in Commerce and other qualified students to work on special problems relating to teaching.

to work on special problems relating to teaching.

COURSE IN COMMERCIAL EDUCATION

For description of degree course in Commerce see pages 180-183 of this Catalogue. The following outline represents the work suggested in the junior and senior years for those who are to teach commercial branches.

	Semester	
	1st	2nd
Junior Year		
Vocational Psychology (Psy. 220).....	3	
Educational Psychology (Psy. 210).....		2
Principles of Education (Ed. 100).....	3	
History of Education (Ed. 120).....		3
Lecture and Reading Course (Com. 141).....		1
	—	—
	6	6
Senior Year		
Secondary Education in Commerce (Com. Ed. 600, 601)..	2	3
Business Organization and Management (Com. 110).....	3	
Labor Problems (Com. 213).....		3
Approved Electives	5	4
	—	—
	10	10

The following courses are offered:

600. Secondary Education in Commerce. The principles of education as applied to the teaching of commercial subjects in secondary schools. Aims, materials, and methods as adapted to all of the commercial subjects taught in the high school, including the organization of courses and the various phases of class-room and laboratory instruction. Special emphasis is given the supervision and direction of practical work.

Prerequisites: Commerce 102, 402, 412. Psy. 220. Ed. 100. Required of students preparing to teach commercial branches. Senior year; first semester; 2 credits; 2 recitations; 1 laboratory period.

601. Practice Teaching in Commerce. Required of seniors in Commercial Education.

Prerequisites: Commerce 102, 402, 412. Psy. 220. Ed. 100. Com. Ed. 600. Senior year; second semester; 3 credits; 2 recitations; practice teaching.

602. Practice Teaching in Commerce. Facilities will be afforded students in commercial education to extend the amount of practice teaching required in course 601.

Elective to seniors and graduates in Commercial Education. Time and credit to be arranged.

CHEMICAL ENGINEERING

RALPH KEMPTON STRONG, Professor of Industrial Chemistry

Chemical Engineering has become a necessary science in the economic management of many of the industries of life. The present need in this country to create new industries to supply products of manufacture formerly imported from abroad, has emphasized the demands upon chemistry and chemical engineering.

Equipment. The department is located on the first floor of the Mines Building where facilities are provided for laboratory practice in industrial chemical work. The laboratory is equipped with cold and hot water, gas, steam, compressed air, vacuum pumps, precision balances, scales for heavy weighing, kettles, filters, direct and alternating electric current, drying oven, hot plate, furnace, and a plentiful supply of regulation apparatus and chemicals.

The standard reference works and texts are kept in the laboratory for constant use in connection with the courses, and the best technical publications are regularly received, complete sets of the journals being available.

Special attention is given to the study of industries already established in Oregon, and to those which offer possibilities for future development. Inspection trips are regularly made by the students to local industries.

The course in Chemical Engineering is arranged so that a general knowledge of engineering materials, machinery and principles is acquired along with special training in physical, organic, inorganic, analytical, and industrial chemistry. Graduates obtain positions in chemical works, either in the laboratory or plant, in analytical and consulting laboratories, and in federal, state, and municipal chemical positions.

DEGREE COURSE IN CHEMICAL ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
General Chemistry (Chem. 105).....	5	
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Mechanical Drawing (C. E. 107).....	3	
English or Modern Language	3	
Drill (Military 1).....	1	
Gymnasium (Phys. Ed. 15).....	$\frac{1}{2}$	
General Chemistry (Chem. 106).....		2
Qualitative Analysis (Chem. 300).....		3
Elementary Analysis (Math. 31).....		5
Descriptive Geometry (M. E. 152).....		3
Forging and Tool Dressing (I. A. 158).....		2
English or Modern Language	3 or 1	1
Drill (Military 2).....		1
Gymnasium (Phys. Ed. 16).....		$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Sophomore Year

Qualitative Analysis (Chem. 301).....	3	
Quantitative Analysis (Chem. 401).....	2	
Differential Calculus (Math. 51).....	4	
Engineering Physics (Phys. 101).....	4	
Crystallography and Blowpipe Analysis (Min. 111).....	3	
Drill (Military 3).....	1	
Gymnasium (Phys. Ed. 17).....	$\frac{1}{2}$	
Quantitative Analysis (Chem. 401a).....		5
Integral Calculus (Math. 52).....		4
Engineering Physics (Phys. 102).....		4
Determinative Mineralogy (Min. 112).....		3
Drill (Military 4).....		1
Gymnasium (Phys. Ed. 18).....		$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year		
Organic Chemistry (Chem. 201).....	3	
Engineering Chemistry (Chem. E. 301).....	3	
Statics and Dynamics (M. E. 251).....	5	
General Materials Testing Laboratory (Exp. E. 225).....	3	
Drill (Military 5).....	1	
Military Science (Theo. Inst. 1).....	1	
Organic Chemistry (Chem. 202).....		3
Industrial Inorganic Chemistry (Chem. E. 302).....		5
Strength of Materials (M. E. 252).....		3
Power and Hydraulic Laboratory (Exp. E. 206).....		3
Drill (Military 6).....		1
Military Science (Theo. Inst. 2).....		1
	16	16
Senior Year		
Physical Chemistry (Chem. 410).....	3	
Industrial Organic Chemistry (Chem. E. 401).....	5	
Electrical Machinery (E. E. 403).....	3	
Seminar (Chem. E. 403).....	2	
Electives	3	
Physical Chemistry (Chem. 411).....		3
Electrochemical Industries (Chem. E. 402).....		3
Industrial Chemical Processes (Chem. E. 404).....		2
Seminar (Chem. E. 406).....		2
Electives		6
	16	16
Electives		
Elements of Thermodynamics (M. E. 319).....	3	
Fire Assaying (Min. 401).....	4	
General Geology (Geol. 135).....	2	
Economic Geology (Geol. 182).....	3	
Ceramic Chemistry (Cer. E. 301).....	3	
Business Organization and Management (Com. 110).....	3	
Metallography and Technical Pyrometry (Exp. E. 246).....		3
Principles of Economics (Com. 210).....		3
Textile Chemistry (Chem. 203).....		2
Food Industries (Chem. 416).....		2
Metallurgy of Iron and Steel (Met. 410).....		2
Electrometallurgy (Met. 442).....		2

The following courses are offered:

301. Engineering Chemistry. A course of lectures and laboratory work designed to give students in the different branches of engineering a knowledge of the chemical processes directly related to their line of work. Some of the topics treated are: Fuels, combustion, refractories, lubricants, boiler feed waters, iron, steel, alloys, cements.

The laboratory work will be adapted to the needs of the individual student when desirable.

Prerequisite: General Chemistry, (Chem. 105 and 106, or the equivalent). Course in Chemical Engineering; junior year; first semester; 3 credits; 2 lecture periods and 1 laboratory period of three hours. Elective for all engineering students. Fee \$4.50. Deposit \$2.25. Text: Benson, Industrial Chemistry for Engineering Students (MacMillan).

302. Industrial Inorganic Chemistry. The principal inorganic industries are studied in lectures and in the laboratory from the viewpoint of modern scientific and applied chemistry. The laboratory instruction is such as to develop ability in the student to carry on independent work with confidence. The principles involved in the problems are carefully studied before the laboratory manipulation is attempted. The valuation of the raw materials and products, and the chemical control of the processes, are given special attention. The topics discussed are those related to salts, acids, alkalies, fertilizers, paint pigments, and other inorganic products.

Prerequisites: Quantitative Analysis, (Chem. 401) and Engineering Chemistry, (Chem. E. 301). Course in Chemical Engineering; junior year; second semester; 5 credits; 2 lecture periods and 3 laboratory periods of three hours each. Elective for other students with the necessary preparation. Fee \$7.50. Deposit \$3.75.

401. Industrial Organic Chemistry. A course of lectures and laboratory work covering the chief organic branches of industrial chemistry. Special emphasis is given to the fundamental principles involved in the various processes studied. The topics studied include: mineral, vegetable, and animal oils, soap, glycerine, rubber, leather, explosives, sugars, starches, destructive distillation of coal and wood.

Prerequisites: Quantitative Analysis (Chem. 401), and Organic Chemistry (Chem. 201 and 202). Course in Chemical Engineering;

senior year; first semester; 5 credits; 2 lecture periods and 3 laboratory periods of three hours each. Elective for other students with the necessary preparation. Fee \$7.50. Deposit \$3.75.

402. Electrochemical Industries. The applications of the electric current to the manufacture of chemical materials by electrolytic and electrothermal reactions are studied by means of lectures and laboratory work. The following topics are treated: Sodium hydroxide and chlorine, hypochlorites, chlorates, perchlorates, oxygen, hydrogen, carbide, graphite, carbon disulphide, phosphorus, sodium, magnesium, aluminum.

Prerequisites: Industrial Inorganic Chemistry (Chem. E. 302), and Physical Chemistry (Chem. 410). Course in Chemical Engineering; senior year; second semester; 3 credits; two lecture periods and one laboratory period of three hours. Fee \$4.50. Deposit \$2.25.

403. Seminar. Conferences on recent developments in applied chemistry. Assigned references and reports. Open only to seniors in Chemical Engineering. First semester.

404. Industrial Chemical Processes. Principles of, and current practice in, the standard processes used in industrial chemical operations, in which attention is also given to problems in design of chemical apparatus and plant.

Prerequisites: Industrial Inorganic and Organic Chemistry (Chem. E. 302 and 401). Course in Chemical Engineering; senior year; second semester; 2 credits; two laboratory periods of two hours each. Fee \$2.00.

406. Seminar. Continuation of Chemical Engineering 403. Open only to seniors in Chemical Engineering. Second semester.

ART AND ARCHITECTURE

FARLEY DOTY McLOUTH, Professor
LAWRENCE EUGENE ROBINSON, Assistant Professor
EDNA MAY FLARIDA, Instructor
EDITH FREEMAN SHERMAN, Instructor

The department of art offers no regular courses in art with the idea of instruction in the fine arts in view, but only as art education relates to highest ideals in everyday life, and to meet the requirements of art in the industries. Courses in drawing, composition, light and shade and color are planned and given for the purpose of facilitating instruction in the applied arts courses — design, metal work, clay modeling, and the ceramic art; and in the work of such other departments as Agriculture, Domestic Art, and Industrial Arts.

The art courses offered not only develop utilitarian ideas, but they also cultivate an appreciation and love of the beautiful in nature and art.

Equipment. The department occupies three commodious, well-lighted studios on the fourth floor of Agricultural Hall, two draughting rooms on the second floor of Science Hall, a metal-working laboratory and a clay-modeling and pottery studio in Waldo Hall. The studios have north light, are well heated and ventilated and are equipped with suitable studio furniture and accessories, such as casts, still life prints, potter's wheel, tools, and benches. The department is also well supplied with wall drawings, pictures, and port-folios illustrating the different phases of the work.

The College Library has a well-selected and growing reserve in art and architecture, covering all branches of the subjects.

102. Free-Hand Drawing. This course covers the work in representation; still life in line and dark and light; free-hand perspective of circles and linear perspective; some of the principles of composition and design; Egyptian ornaments; the handling of pencil and charcoal.

The degree courses in Home Economics; freshman year; first semester; 2 credits; 2 studio periods of two hours each, and one recitation. Fee \$0.50.

103. Beginning Composition. The study of design principles applied to concrete problems of dress or home decoration; brush and ink, charcoal, and pencil are used as media. Greek design is studied.

Prerequisite: Drawing 102. The degree courses in Home Economics; freshman year; second semester; 2 credits; 2 studio periods of two hours each and one recitation. Fee \$0.50.

204. The Theory and Harmony of Color. This course covers the study of the so-called primary colors, the development of the prismatic colors with their complements, color quality, color values and the various harmonies. Problems in monochromatic, complementary, analogous, and dominant harmonies are to be rendered. These problems will be an application of harmonious color schemes as applied to articles of household use, dress, and home interiors.

Prerequisites: Art 102, 103. Degree course in Home Economics; sophomore year; first semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

205. Water Color. The courses in water color are offered as elective cultural subjects and are open to any student who has completed courses 102, 103, and 204, or their equivalent. The work of the first semester will include simple flat washes of geometric casts, and flat color washes of still life subjects of broad area.

First semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

206. Water Color. A continuation of course 205, leaving flat washes and taking up more complex still-life studies, posters, and landscapes.

Prerequisite: Art 205. Second semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

305. Advanced Design. An elective offered to give a broader working knowledge of design principles which shall serve as a guide to selection, adaptation, and composition, both structural and decorative, for practical application in interior decoration, costume design, and for articles of personal and household use.

First semester; 2 credits; 3 studio periods of two hours each. **Prerequisites:** Art 102, 103, and 204. Fee \$0.50.

306. Advanced Design. A continuation of course 305.

Prerequisites: Art 102, 103, 204, and 305. Second semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

411. Industrial Arts Drawing. Free-hand perspective and working sketches of wood joints, furniture, and machine parts; and drawing from written descriptions.

The degree course in Industrial Arts; freshman year; second semester; 2 credits; 3 studio periods of two hours. Elective;

M. E. Vocational course; first year; second semester; 1 credit; 3 studio periods of one hour each. Fee \$0.50.

412. Industrial Arts Design. A course in the principles of design suited to the Industrial Arts course. Original design plates of door and cabinet paneling, metal parts, hinges, escutcheons, draw pulls, etc., and furniture, will be required.

The degree course in Industrial Arts; sophomore year; first semester; 1 credit; 3 studio periods of one hour. Fee \$0.50.

413. Clay Modeling and Pottery. The study of the modeling and making of pottery occupies most of the time. Different ways of making and decorating vases will be studied, using the hand work and the potter's wheel. Modeling from nature, tile building, mold and cast making in plaster, firing and glazing.

Prerequisites: Art 102 and 103. Elective; the degree courses in Home Economics; senior year; first semester; 2 credits; 3 studio periods of two hours each. Fee \$2.00.

414. Clay Modeling and Pottery. A continuation of course 413 with more advanced work and more time given to clay modeling.

Prerequisites: Art 102, 103, or their equivalents, and 413. Elective; the degree course in Home Economics; senior year; second semester; 2 credits; 3 studio periods of two hours each. Fee \$2.00.

505. Water Color Rendering. The purpose of this course in water color rendering is to give a knowledge of the handling and use of the brush and color in the expression of landscape gardening subjects, detail, and decoration.

Fee \$0.50.

506. Water Color Rendering. A continuation of course 505, followed by full color drawings of landscape gardening subjects. Later in the semester opportunity is given for out-of-door sketching in color.

Elective; degree course in Landscape Gardening; sophomore year; second semester; 2 credits; 2 studio periods of three hours each.

The following courses are open to other students who have completed courses 102 and 103 or their equivalents and to Industrial Arts students having completed courses 411 and 412 or their equivalents. Fee \$0.50.

600. Jewelry Making. The first semester will be given to work in jewelry-making, using copper and silver, and covering the processes of sawing, hard and soft soldering, stone setting, etching, and repousse.

Prerequisites: Art 102, 103, or their equivalent. Elective; the degree course in Home Economics; or any student having the desired prerequisites; 2 credits; 6 studio periods. Fee \$1.00. Deposit \$2.00.

601. Jewelry Making. A continuation of course 600, with the addition of enameling.

Prerequisites: Art 102, 103, and 600. Elective; the degree course in Home Economics; or any student having the desired prerequisites; second semester; 2 credits; 2 studio periods of three hours each. Fee \$1.00. Deposit \$2.00.

602. Art Metal Work. The work of the first semester will cover the processes of piercing, etching, sinking, sawing, riveting, straight bending and repousse, in the making of such articles as desk sets, book ends, trays, ladles, bag tops, plates, hinges, corners, etc.

Industrial Arts students; 2 credits; 3 two-hours periods. Fee \$1.00. Deposit \$2.00.

603. Art Metal Work. The second semester work will be largely the problems of raising, hard and soft soldering, and soft enameling, in the making of pitchers, vases, etc.

Industrial Arts students; 2 credits; 3 two-hours periods. Fee \$1.00. Deposit \$2.00.

RURAL ARCHITECTURE

The courses in architecture are offered first to students in agriculture who may major in rural architecture or elect subjects pertaining to farm structures; to students in industrial arts who take house planning; to students in landscape gardening who take subjects in landscape architecture; to students in home economics who take house construction and decoration, and to all others who are interested in rural and domestic architecture and are prepared to take the subjects.

The work is especially adapted to meet the utilitarian requirements of the other departments of the College and to serve these departments in an able manner. The courses consist of problems in design and construction and a consideration of building materials.

For students of agriculture the course amounts to agricultural engineering. It is important for men who contemplate this work

in agricultural colleges, who intend to develop farm establishments, who favor structural work or who themselves have buildings to erect.

The following courses are offered:

439. Horticultural Products Buildings. A study of structures used in the drying, canning, and evaporation of fruits. The course consists of tours of inspection and drawing plans, elevations, and sections of structures used for by-products of fruits.

Senior year; second semester; 2 credits.

518. Perspective Drawing. A study of mechanical perspective. Elective; sophomore year; second semester; 1 credit; 1 draughting room period. Fee \$0.50. Text: Frederick, Simplified Mechanical Perspective.

533. Agricultural Building Design. This course is for students of agriculture. Design and construction of buildings for the farm are studied. The work is individual; thus each student may elect the particular kind of buildings in which he is especially interested.

Agriculture; elective; first semester; 2 credits; 2 draughting room periods of three hours each. Fee \$0.50. Text: Howe, Agricultural Drafting.

535. Advanced Agricultural Building Design. A continuation of course 533.

Agriculture; elective; second semester; 2 credits; 2 draughting room periods. Fee \$0.50.

536. Farm Plan Drawing. The work of this course is prescribed for students studying farm management. The conventional methods of indicating lines, roads, fields, etc., will be carefully presented.

Agriculture; elective; first semester; 1 credit; 1 draughting room period. Fee \$0.50. Text: Howe, Agricultural Drafting.

537. Farm Structures. Advanced drawing of concrete and frame structures. Details of construction, sanitation, and economic principles as advanced by other departments will receive strict attention. This course is for students who wish to specialize in agricultural engineering or rural architecture.

Prerequisites: Arch. 533 and 535. Agriculture; elective; first semester; 4 credits; 4 draughting room periods. Fee \$1.00.

538. Farm Structures. A continuation of course 537.

Agriculture; elective; second semester; 4 credits; 4 draughting room periods. Fee \$1.00.

601. Elementary Landscape Architectural Drawing. This course takes up lettering and line drawing at the beginning and develops into the study of the presentation of garden plans. The relation of architecture to the garden will be observed in all drawings and various architectural styles will be noted. Only pen and ink drawings will be presented.

Landscape Gardening; freshman year; first semester; 3 credits; 3 draughting room periods. Fee \$0.75.

602. Advanced Landscape Architectural Drawing. A continuation of course 601, in which drawings will be made using water colors.

Landscape Gardening; freshman year; second semester; 3 credits; 3 draughting room periods. Fee \$0.75.

603. Landscape Architectural Design. Problems in the design of gardens and grounds presented not as working drawings but as rendered sketch drawings showing geometry of plan, color scheme and perspective.

Prerequisites: Arch. 601, 602 and 518. Landscape Gardening; junior year; first semester; 3 credits; 3 draughting room periods. Fee \$1.00.

604. Landscape Architectural Design. A continuation of course 603.

Landscape Gardening; junior year; second semester; 3 credits; 3 draughting room periods. Fee \$0.75.

701. Elementary House Planning. This course consists of practical problems in planning and construction. All drawings will be working-drawings presented on detail paper. The work is prescribed for Industrial Arts students.

Industrial Arts; junior year; first semester; 3 credits; 3 draughting room periods. Fee \$0.75.

702. Advanced House Planning. A continuation of course 701.

Industrial Arts; junior year; second semester; 3 credits; 3 draughting room periods. Fee \$0.75.

H. A. 501. House Construction and Decoration. (See page 325, School of Home Economics.)

Fee \$0.50. Text: Robinson, Domestic Architecture.

H. A. 502. Advanced House Construction. A continuation of H. A. 501.

Domestic Art; elective; second semester; 2 credits; 2 draughting room periods of two hours each. Fee \$0.50. Text: Robinson, Domestic Architecture.

CHEMISTRY

JOHN FULTON, Professor
JOHN HICKS, Associate Professor
MARY HARTZELL, Assistant Professor
DONALD TRESSLER, Instructor
EARL GILBERT, Instructor
WILLIAM HODGE, Instructor
ROBERT PRESTON, Instructor
HAROLD KELLY, Instructor

The beginner's courses, Chemistry 100, 101, and 102, consist essentially of the proof of some of the well-known chemical laws, such as the law of conservation of matter, the law of definite proportions and of multiple proportions, the Law of Boyle, and the Law of Charles. The student attains skill in the manipulation of apparatus, and in the management of equipment in general. From this elementary work he proceeds to qualitative analysis, in the study of which he is taught to separate and identify the different elements composing the mass, and, in the case of metals, to learn of their properties, their use, the different methods of obtaining them from their ores, and the combinations in which they occur in nature.

If he has shown suitable proficiency, he advances to quantitative analysis, which is the determination of the amounts of the ingredients. He is taught both methods of analysis, volumetric, or the method by solution, and the gravimetric, or the method by precipitation and weighing. On completing these courses, the student is fairly well prepared to take up advanced chemistry, which treats of the analysis of soils, manures, cattle foods, dairy products, etc., or he can take up the subject from the inorganic side in the analysis of minerals, fuels, oils, gas, etc., or he can view it from the pharmacist's standpoint, in analyzing drugs.

Equipment. The department of Chemistry occupies nearly the whole of Science Hall, except the fourth floor, which is occupied by the department of Pharmacy, and a few rooms on the third floor that are at present used by the department of Rural Architecture. The Chemical department of the Experiment Station has four rooms on the second floor.

The largest room in the building is the main general laboratory, which will accommodate 550 students in four sections. Adjacent to this laboratory is the general stock room, that in itself is a

division of the department. It is well stocked with all the necessary apparatus and chemicals required for all the courses given in the department. One of the greatest improvements in the Chemical department is the new gas machine; this, when working at its full capacity, can supply gas for 800 burners.

The new organic laboratory has been increased in size until it now contains room for 240 students. The equipment is of the best.

The new quantitative analysis room now has accommodations for 96 students in four sections. Its equipment of hot and cold water, gas, pressure pumps, etc., makes it as good as the best.

The qualitative analysis room can accommodate 50 students in three sections. Great pains have been taken to make this room as nearly an actual chemical work room as possible.

In the balance room there are 23 analytical balances.

The main lecture room, which is situated on the third floor, has a seating capacity of 150. It is provided with lecture tables that are supplied with gas, electricity, and water. Adjoining the lecture room is a small preparation room, in which is kept all special apparatus used for lecture demonstration, as well as supplies for the agricultural laboratory. This room is equipped with all the necessary apparatus for the proper elucidation of the principles of this branch of chemistry.

For the work in quantitative analysis (advanced), an entire room is set aside. This room is fitted with gas, water, and electricity; condensers for distilled water; batteries; extraction apparatus for fats; nitrometers; Kjeldahl apparatus; hot-water filtering apparatus; grinders for fodders, steam and air baths, calorimeter, polariscope, Westphal and analytical balances; coarse balance for rough work, hot-plates, and minor apparatus.

COURSE IN AGRICULTURAL CHEMISTRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

101. General Chemistry. Continuation of course 100.

Prerequisite: Chemistry 100 or its equivalent. Freshman year; second semester; 2 credits; 1 recitation or lecture; 2 laboratory periods of 3 hours each. Fee \$3.00. Deposit \$2.00. Text: Smith, General Chemistry for Colleges. Laboratory manual Qualitative Analysis.

108. Advanced Inorganic Chemistry. Some topics considered: the periodic system; theories of valency; X-rays and crystal structure; cooling curves; the thermal equilibrium diagram; inorganic isomerism; the cobaltammines; colloids; etc.

Prerequisite: Chemistry 411 or its equivalent. Elective; first semester; 3 credits; 1 conference or lecture; 2 laboratory periods of three hours each. Fee \$4.00. Deposit \$3.00.

111. General Chemistry. This is a course designed especially for students entering in the second semester. The ground covered is the same as that of 100 and 101, except that it calls for double the credit and requires twice as much of the student's time during the semester.

Freshman year; second semester; 6 credits; 5 recitation and lecture periods; 2 laboratory periods of three hours each. Fee \$6.00. Deposit \$4.00. Text and Laboratory Manual same as for Chemistry 100 and 101.

121. History of Chemistry. Devoted largely to the rise and development of chemical theories and laws.

Prerequisite: Chemistry 11 or its equivalent. Elective; second semester; 2 credits; 2 lectures or recitations. No fee.

510. Plant Chemistry. Designed for students desiring a fuller consideration of the growth and composition of plants; properties, nature, and classification of plant constituents; chemical analysis; chemical synthesis; enzymes; chemistry of the manufacture of plant products, etc.

Prerequisite: Chemistry 501 or its equivalent. Second semester; 2 credits; 2 lectures. Laboratory work to extent of 2 to 3 credits may be taken in connection with the lectures. Text: Haas and Hill, Chemistry of Plant and Plant Products. Assigned reading.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Agricultural Chemical Analysis (Chem. 505).....	3	
Organic Synthesis (Chem. 305).....		3
Trigonometry (Math. 11).....	3	
College Algebra (Math. 21).....	2	
Elementary Algebra (Math. 31).....		5
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives	4	7
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Agricultural Analysis (Chem. 507, 508).....	4	4
Elementary Physical Chemistry (Chem. 410).....	3	
Thermo and Electro Chemistry (Chem. 411).....		3
Seminar in Chemistry (Chem. 511, 512).....	1	1
Physiological Chemistry (Chem. 409).....		3
Electives	6	3
	17	17

Electives may be taken in Chemistry, Physics, Botany, Zoology, Plant Physiology, Animal Physiology, Mathematics, Modern Language, Anatomy, Geology, etc.

Graduate Courses. The following courses may be taken by graduate students as major or minor electives with full credit: Chemistry 104, 302 to 316 inclusive, and 502 to 512 inclusive. The department reserves the right to require additional work in certain cases before credit for these courses be awarded toward an advanced degree.

The following courses are offered:

10. General Chemistry. Fundamental principles of the science; non-metallic elements and their compounds.

Prerequisites: Mathematics A and B. Required of all students who have not had elementary chemistry in high school, except those registered in the degree courses in Pharmacy, Mining, Commerce (Elective), and Landscape Gardening. Freshman year; first semester; 3 credits; 1 lecture; 2 recitations; 2 laboratory periods.

Fee \$3.00. Deposit \$2.00. Text: Smith, General Chemistry for College (Revised.)

11. General Chemistry. Non-metallic and metallic elements and their compounds. Conceptions of chemical equilibrium and the modern theory of solutions frequently applied.

Prerequisite: Chemistry 10 or its equivalent. Freshman year; second semester; 3 credits; 1 lecture; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

12. Elementary Household Chemistry. A course arranged for women who do not care to take the full chemical courses leading to the degree in Home Economics. As its name implies, it is a fragmentary elementary course in the application of chemistry to daily life, rather than an exposition of chemical principles.

It treats of such subjects as the relation of combustion to heat, lights and illuminants; commercial soaps; special soaps and scouring powders; general composition of foods; functions of food; textile fibres; bleaching and bluing, etc.

First semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each. Text: Snell, Elementary Household Chemistry.

13. Elementary Household Chemistry. A continuation of course 12.

Freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each. Fee \$3.00. Deposit \$2.00.

Courses 12 and 13 will not be accepted as substitutes for courses 100 and 101.

100. General Chemistry. Fundamental principles; non-metallic elements and their compounds.

Prerequisite: Elementary High School chemistry. Required of all students having had chemistry in the high school (see note below) registered in the degree courses, except Pharmacy, Mining, Commerce (Elective), and Landscape Gardening. Freshman year; first semester; 3 credits; 2 recitations or lectures; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Smith, General Chemistry for Colleges.

101. General Chemistry. Non-metallic and metallic elements and their compounds. Conceptions of chemical equilibrium and the modern theory of solutions are frequently applied.

NOTE — Students who have had one year of chemistry in a standard high school may be permitted to take an examination for credit in Chemistry 10 and 11 provided their high-school credits are not used as entrance units. This examination will be held one week after the opening of the first semester. Laboratory notebooks must be presented.

Prerequisite: Chemistry 100 or its equivalent. Freshman year; second semester; 3 credits; 2 recitations or lectures; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text same as for Chemistry 100.

102. General Chemistry. This course is especially arranged for the students of the School of Home Economics.

Freshman year; first semester; 2 recitations; 2 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

103. General Chemistry. A continuation of course 102.

Freshman year; second semester; 2 recitations; 2 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

104. Chemical Calculations. Calorimetric; specific gravity; gas calculations; calculations of atomic weights and formulas; gravimetric analysis; volumetric analysis.

Prerequisite: Quantitative analysis. Elective; junior or senior year; first or second semester; 2 credits; 2 recitations. (Note: A minimum of 5 students required.) Text: Ashley, Chemical Calculations.

105. General Chemistry for Mining, Chemistry, Chemical Engineering, and Pharmacy students especially, but also open to others who desire to complete General Chemistry, and Qualitative Analysis during the first year.

Freshman year; first semester; 5 credits; 3 recitations; 2 laboratory periods of three hours each. Fee \$5.00. Deposit \$2.00.

106. General Chemistry. A continuation of 105, but with this difference, that Qualitative Analysis succeeds the laboratory manual used in the first semester. This course is open to any one having completed 101, or its equivalent.

The general chemistry text is used as the basis of the recitations in this course which is really descriptive chemistry.

Freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods of three hours each. Fee \$5.00. Deposit \$2.00. Text: Baskerville and Curtman, Qualitative Analysis.

200. Elementary Organic Chemistry. A study of fundamental principles and more important compounds; petroleum and its products, alcohols, ethers, aldehydes, fatty acids, oils, soaps.

Prerequisite: Chemistry 11 or 101. Course in Home Economics, and Vocational Pharmacy; sophomore year; first semester; 4 credits; 2 recitations; 3 laboratory periods. Fee \$4.00. Deposit \$2.00. Text: Cohen, Organic Chemistry.

200-a. Elementary Organic Chemistry. A course of lectures in Organic Chemistry for those desiring lectures alone and having no time for laboratory work. This course is designed primarily for agricultural students, and should be taken before or with Agricultural Chemistry. It may be taken also by students of other departments who wish to extend their chemical studies in this direction.

Prerequisite: Chemistry 101 or 103. Elective; sophomore year; either semester; 2 credits; 2 lectures.

201. Organic Chemistry. Aliphatic compounds; hydrocarbons, alcohols, ethers, esters, aldehydes, acids, fats, ketones, amines, carbohydrates. Preparation and identification of typical and simple compounds.

Prerequisite: Chemistry 11 or 101. Course in Pharmacy; sophomore year; and Chemical Engineering; junior year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Cohen, Organic Chemistry.

202. Organic Chemistry. Aromatic Compounds; cyclic hydrocarbons, nitro derivatives, amines, diazo compounds, phenols, dyes, proteins, alkaloids.

Prerequisite: Chemistry 201. Course in Pharmacy, sophomore year; and Chemical Engineering, junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Cohen, Organic Chemistry.

203. Textile Chemistry. Consists of identification of the different materials used in the textile industries.

Junior year; second semester; 2 credits; 1 lecture; 2 laboratory periods of two hours each. Prerequisite: Chemistry 200. Fee \$2.00. Deposit \$2.00.

300. Qualitative Analysis. This course consists largely of laboratory practice in the ordinary process of separating and identifying ions. It is given in conjunction with 106, and in fact constitutes the laboratory part of the above course.

Freshman year; first semester; 3 credits; 3 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00. Texts: Smith, Chemistry. Baskerville and Curtman, Qualitative Analysis.

301. Qualitative Analysis. A course provided for Mining students who have completed 101, or the equivalent.

Freshman year; first semester; 5 credits; 2 recitations and three laboratory periods of three hours each. Fee \$5.00. Deposit

\$2.00. Texts: Smith, Chemistry. Baskerville and Curtman, Qualitative Analysis.

301-a. Qualitative Analysis. A general course for all students desiring to complete this number during the first semester.

Prerequisite: Course 100. Three credits; 3 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00.

301-b. Qualitative Analysis. A continuation of 301-a consisting of investigation of the properties of the rarer metals.

Prerequisite: Course 100. Three credits; 1 lecture; 2 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00.

302. Qualitative Analysis. Students in Highway Engineering. Three credits; 1 recitation; 3 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

303. Organic Qualitative Analysis. A course for Pharmacy students.

Elective; second semester; 3 credits; 2 recitations; 2 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00.

304. Food and Drug Analysis. This course affords suitable preparation for the students to hold positions in the Federal Food and Drug Laboratories.

The food and drug products on the market that are subject to the greatest adulteration will be analyzed for preservatives and other added materials.

Prerequisites: Organic Chemistry and Botany. Senior year; 3 credits; 3 laboratory periods. Fee \$3.00. Deposit \$2.00.

305. Organic Synthesis. The synthesis of the more complex organic compounds of both the aliphatic and aromatic series, coupled with such reference work as may be to the advantage of the student. The class work in the course will be in the form of a seminar.

Prerequisites: General, qualitative, quantitative, and beginning organic chemistry. Elective for Agricultural Chemistry, Pharmacy, and other students having sufficient training. Senior year; first semester; 3 credits; one seminar and 2 three-hours laboratory periods. Fee \$3.00. Deposit \$2.00.

400. Quantitative Analysis. For Chemical Engineering, Pharmacy, and Mining students, and consisting of the usual work in general quantitative analysis.

Prerequisite: Chem. 105. Sophomore year; first semester; 4 credits; 1 lecture period; 3 laboratory periods of 3 hours each. Fee \$5.00. Deposit \$3.00.

400-a. Quantitative Analysis. For students in Chemical Engineering given at the same time as 400, but more work to the extent of one credit is required of the chemical engineering students.

Prerequisite: Same as for 400. Sophomore year; first semester; 5 credits; 1 lecture; 4 laboratory periods of 3 hours each.

401. Quantitative Analysis. This is a course in analysis for Mining students, and consists of gravimetric analysis of limestones, iron, lead, zinc, arsenic, and antimony ores, coal, and as much other work as time will permit.

The course in Mining Engineering; sophomore year; first semester; 5 credits; 1 recitation; 4 laboratory periods. Fee \$5.00. Deposit \$2.00. Text: Frank and Clemens.

401-a. Quantitative Analysis. A continuation of course 400-a.

A course for Chemical Engineers.

Prerequisites: Chem. 400 or 400-a. Sophomore year; second semester; 5 credits; 1 lecture period; 4 laboratory periods of 3 hours each. Fee \$5.00. Deposit \$3.00.

402. Chemistry of Foods. A qualitative and quantitative examination of sugars, fats, proteins, leavening agents. Adulteration of foods, with simple methods of detection; food legislation.

Prerequisite: Chem. 200. Required of all students in Home Economics; sophomore year; second semester; 4 credits; 2 recitations; 3 laboratory periods. Texts: Leach, Food Inspection and Analysis. Olsen, Pure Foods. Sherman, Food Products. Sherman, Organic Analysis. U. S. Bul. 107 (revised). Fee \$4.00. Deposit \$2.00.

403. Chemistry of Water. This course is especially for the students in Highway Engineering, and consists of the examination of waters for potability, and for adaptability for industrial purposes. This course is divided into two parts; first, Sanitary Water Analysis, which investigates the methods of analysis applied to water and sewage, as outlined by the American Public Health Association; second, Chemical Studies of Industrial Waters, which includes the examination of various waters with reference to their adaptability to industrial processes such as heating plants, laundries, paper mills, etc.

Junior year; second semester; 2 credits; 2 laboratory periods. Text: Standard Methods of Water Analysis. A. P. H. A. Fee \$2.00. Deposit \$2.00.

404. Alkaloidal Testing. A study of the alkaloids of the drug plants as regards their structure and synthesis. The means of their identification by the various alkaloidal tests will be studied in the laboratory as well as the means of identifying those organic compounds that enter pharmaceutical preparations. This course will also include the means of detection of the common poisons in the animal body.

Prerequisites: Chemistry 100, 101, 300, and 201. First semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

405. Drug Assaying. The quantitative estimation of the active principles of crude drugs and their preparations, such as solid and fluid extracts, tinctures, pills, etc. The assay of a number of inorganic pharmaceutical preparations will be included in this course.

Methods for the physiological standardization of drugs and drug preparations will be discussed by the instructor.

Prerequisites: Chemistry 100, 101, 300, 201, and 404. Second semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

406. Chemistry of Highway Materials. The course is designed for students in Highway Engineering, and consists of the study of such materials as cement, asphalt, bitumen, mineral oils, tar, and tar products.

The course in Highway Engineering; junior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

407. Applied Electro-Chemistry. Applications of the electric current to analytical operations; electroplating; electrolytic oxidation and reduction; storage batteries; the electric furnace, etc.

Prerequisites: Chemistry 401 or its equivalent and Chemistry 410 and 411 or their equivalent. Chemical Engineering; senior year; first semester; 3 credits; 1 conference; 6 to 8 hours a week in laboratory. Fee \$3.00. Deposit \$2.00. Text: Thompson, Applied Electro-Chemistry. Laboratory Outline of Electro-Analysis.

408. Chemistry for Engineers. This course is particularly for students in Mechanical and Electrical Engineering. It consists of the analysis of coal, oil, gas, and of their calorific powers; also the technical analysis of flue gases.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

409. Physiological Chemistry. Chemical study of the fats, carbohydrates, and proteins; discussion of enzyme action, digestion, absorption, and excretion; analysis of blood, gastric juice, and both normal and pathological urine; and demonstrations and assigned reading.

Prerequisites: General and organic chemistry. Pharmacy, Household Science, and Agricultural Chemistry; senior year; second semester; 3 credits; 2 lectures and 2 two-hours laboratory periods. Fee \$2.00. Deposit \$2.00.

410. Elementary Physical Chemistry. Molecular weight determinations; properties of liquids; dilute solutions; solubilities; conductivity of solutions; chemical equilibrium; velocity of reactions.

Prerequisites: Mathematics 31 and Chemistry 401 or their equivalents. Chemical Engineering and Agricultural Chemistry; junior or senior year; 3 credits; 2 lectures and recitations; 1 laboratory period of 4 hours. Fee \$3.00. Deposit \$2.00. Text: Senter, Outlines of Physical Chemistry. Findlay, Practical Physical Chemistry.

411. Principles of Thermo-Chemistry and Electro-Chemistry. Thermochemical measurements; relation of chemical affinity to heat of reaction; conductivity of solutions; electromotive force.

Prerequisite: Chemistry 410. Chemical Engineering and Agricultural Chemistry; junior or senior year; second semester; 3 credits; 1 conference; 6 to 8 hours a week in laboratory. Fee \$3.00. Deposit \$2.00. Texts: Otswold-Luther, Physico-Chemical Messungen. Findlay, Practical Physical Chemistry. Thomsen, Thermochemistry. Leblanc, Electro-chemistry. Senter, Outlines of Physical Chemistry.

412. Metallurgical Analysis. This consists of the analysis of Metallurgical and Engineering materials, such as limestone, cement, coal, iron ore, copper matte, brass, bronze, steel, babbit metal, water, oil, etc.

The course in Chemical and Mining Engineering; sophomore year; second semester; 3 credits; 3 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Sidener, Quantitative Metallurgical Analysis.

413. Chemical Technology. A course of lectures in the principles of Organic, Analytical, and Technical Chemistry as applied

to those industries depending upon chemistry as a basis for their processes.

The course in Chemical Engineering; senior year; first semester; 2 credits. A continuous course; credit will not be awarded until the second semester's work has been completed.

414. Chemical Technology. A continuation of course 413.

The course in Chemical Engineering; senior year; second semester; 2 credits. Text: Thorpe, Industrial Chemistry.

415. Methods of Teaching Chemistry. A course designed for those who expect to teach chemistry in secondary schools. Lectures, reports, discussions. A critical study will be made of laboratory, experiments, equipment, sources of materials, modern textbooks, and manuals.

Prerequisites: Chem. 100, 101, 200, and 402.

416. Food Industries. A critical study of cereals, breakfast foods, beverages, animal foods, milk products, spices and condiments. Illustrated with lantern slides.

Prerequisite: Chemistry 402. Elective; junior or senior year; second semester; 2 credits; 2 recitations. Fee \$2.00. Deposit \$2.00. Text: Vulte and Vanderbilt. Food Industries.

417. Methods in Gas Analysis. Required of all Mining students.

Prerequisite: Chem. 401. Sophomore year; second semester; 1 credit; 1 laboratory period of three hours. Fee \$1.00. Deposit \$2.00.

418. Elementary Glass Blowing and Repairing. A course in the elements of the art of welding, cutting, and grinding glass. For upper classmen only, especially for those who expect to become instructors in science in high schools.

Junior or senior year; 1 credit; 1 laboratory period of three hours. Fee \$2.00. Each person procuring his own glass and files. Text: Woollatt, Laboratory Arts, or Frary, Glass Blowing.

500. Agricultural Chemistry. A general course consisting of lectures, recitations, and laboratory work, dealing with the more important phases of Chemistry in its relation to Agriculture.

Prerequisite: Chemistry 101. The course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations. Fee \$3.00. Deposit \$2.00. Text: Tartar and Dutcher, Lecture Notes on Chemistry in its Relation to Agriculture.

501. Agricultural Chemistry. A continuation of course 500.

The course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

502. Dairy Chemistry. A course consisting of lectures, recitations, and laboratory work dealing with the chemistry of milk, milk powders, condensed milk, butter, oleomargarine, cheese, and other dairy products.

Prerequisites: Chemistry 500 and 501. Required of students majoring in Dairy Manufacturing; junior year; second semester; 3 credits; 3 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00. Text: Bulletin 107, U. S. Bureau of Chemistry. Lincoln and Walton, Quantitative Chemical Analysis. Assigned reading.

503. Soil Chemistry. This is a lecture and laboratory course dealing with the constitution and properties of the chemical constituents of soils; the methods of qualitative and quantitative chemical soil analysis; the chemical changes taking place in soils; the soil solution; and chemical soil deficiencies.

Prerequisite: Chemistry 501. Junior year; first semester; 2 to 4 credits; 2 to 4 laboratory periods of three hours each. Fee \$1.00 per credit. Deposit \$2.00.

504. Soil Chemistry. A continuation of course 503.

Junior year; second semester; 2 to 4 credits; 2 to 4 laboratory periods of three hours each. Fee \$1.00 per credit. Deposit \$2.00.

505. Agricultural Analysis. A course in analytical methods applied to agricultural materials, including cereals, fertilizers, soil, water, vinegar, insecticides, fruit juices, feeding stuffs, etc.

Prerequisites: Chemistry 500 and 501. First semester; 2 to 4 credits; 2 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

506. Agricultural Analysis. A continuation of course 505.

Second semester; 2 to 4 credits; 2 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

507. Advanced Agricultural Analysis. This course is special work in the Experiment Station laboratory, or work of the same general description.

Senior year; first semester; 3 to 4 credits; 3 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

508. Advanced Agricultural Analysis. A continuation of course 507.

Senior year; second semester; 3 to 4 credits; 3 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

509. Animal Chemistry. A study of the composition of the animal body and products of the animal body, such as milk, wool, etc. Special emphasis is placed on the chemistry of the fats, proteins, and carbohydrates. Enzyme action, digestion of foodstuffs their absorption and distribution, fate of the foodstuffs in metabolism, metabolic products and their excretion, will be considered. Recent publications bearing on animal nutrition will be read and discussed.

Prerequisite: Chem. 501 or its equivalent. Junior year; first semester; 2 credits; 2 lectures. Fee \$2.00. Deposit \$2.00.

510. Plant Chemistry. Designed for students desiring a fuller consideration of the growth and composition of plants; properties, nature, and classification of plant constituents; chemical analysis; chemical synthesis; enzymes; chemistry of the manufacture of plant products, etc.

Prerequisite: Chemistry 501 or its equivalent. Second semester; 2 credits; 2 lectures. Text: Haas and Hill, Chemistry of Plant and Plant Products. Assigned reading.

511. Seminar. The work will consist of reports and reviews of articles appearing in scientific journals, and experiment station literature. These papers will be prepared under the supervision of the department, although considerable latitude will be allowed in the selection of subjects and manner of presentation. Required of all senior students majoring in Agricultural Chemistry.

Junior or senior year; first semester; 1 credit.

512. Seminar. A continuation of course 511.

Second semester; 1 credit.

Before taking up the subject of chemistry, students are advised to review thoroughly the elementary principles of physics, especially those related to the mechanics of gases, liquids, and solids with reference to their densities, specific gravities, solubilities, rates of diffusion, etc. Excellent summations are given in Black and Davis' Practical Physics, of which a two-weeks review is given

before entering upon any of the elementary courses in Chemistry. This review will consist of lectures and demonstrations, and assignments of problems.

A. Elementary Chemistry. Fundamental laws of chemistry; general properties of matter; non-metallic elements and their compounds; special attention to oxidation and reduction.

Vocational students in Mechanic Arts; second year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: McPherson and Henderson, Elementary Chemistry.

B. Elementary Chemistry. Metals; their compounds; alloys; special attention to chemical behavior of metals under shop conditions.

Prerequisite: Chemistry A. Vocational Students in Mechanic Arts; second year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

ENGLISH LANGUAGE AND LITERATURE

FREDERICK BERCHTOLD, Professor
IDA BURNETT CALLAHAN, Associate Professor
SIGURD HARLAN PETERSON, Assistant Professor
LOREN BURTON BALDWIN, Assistant Professor
GERTRUDE EWING McELFRESH, Instructor
GRACE ROSAAEN-SIEFERT, Instructor
CHARLES JARVIS McINTOSH, Instructor

It is the aim of this department to teach the student to express with clearness what he thinks with vigor. He is taught that the essential part of any composition, whether oral or written, is thought, well organized and well expressed; that to comprehend clearly and to feel strongly what he has to say are the indispensable conditions of making others comprehend and feel it.

What his textbook helps him to do consciously, familiarity with superior writers should help him to do unconsciously; for we may get good from a master of English by unconscious absorption, just as we acquire good manners by associating with gentlemen and ladies. No mind can fail to be stimulated by contact with greater minds, whether living or dead. Their pages feed the powers of thought and strengthen the power of expression, thus enabling the student to think, talk, and write to more purpose.

In all the collegiate courses in English the work is correlated with that offered in the other departments, to bring it into harmony with the trend or spirit of the institution, which is distinctly technical and industrial in character. Subjects are assigned for presentation and discussion which bear close relation to the work pursued by the students in the different schools, in anticipation of their probable needs and activities in later life. What is sought and insisted on is earnest, logical, forceful presentation of facts that will compel attention and carry conviction.

The Oregon Agricultural College participates in a number of intercollegiate oratorical contests and debates; and the department offers elective courses in public speaking, designed to give preparation for these contests.

The following courses are offered:

31. College Rhetoric. A rapid survey comprehending the work done by the high school in literature, rhetoric, and composition, and involving the preparation of several short essays, with a view to ascertaining the extent of the student's literary appreciation and

command of rhetorical principles. Lectures, assignments, and recitations upon the methods of effective discourse. Studies in the expository and argumentative methods of writing, with analysis of specimens. The paragraph considered as a distinct stage in expository composition; practice writing to exemplify the various methods of developing the topic statement. Plotting of simple briefs, and writing of easy forensics. At every stage of study selections from standard and contemporary authors will be read and discussed, in order that the student may acquire ability to master content, differentiate literary types, and appreciate standards of excellence. Subjects of composition will be those suggested by the student's personal, school, literary, community, and vocational interests. Oral composition supplementing written.

Compositions required: five expository and three argumentative short themes; one expository theme requiring research and accompanied by outline and bibliography; one resume and one criticism; one argumentative long theme, accompanied by brief. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that the student writes in other departments.

Prerequisite: Three years of English in an accredited high school. The course in Home Economics; freshman year; first semester; 3 credits; 3 recitations. Text: Greenough and Hersey, English Composition.

32. Advanced College Rhetoric. Study of the elements and principles involved in effective discourse, continued. Lectures on the characteristics of the literature of feeling, with rendering of selections for illustration. Discussion of the narrative and descriptive methods of writing. Expository and emotional description differentiated. Examination of the narrative principle in epic forms, in ballad literature, and in the incidents occurring in the drama, in the news letter, and in anecdote. Studies and practice writing in the narrative paragraph and in dialogue. Analysis of two or three of the briefer and less complex short stories of standard authors, for the purpose of gaining an appreciation of the form and function of the short-story type.

Written composition, confined, for the most part, to the descriptive and narrative types of discourse, will be similar in character to that of the first semester. Frequent oral delivery.

Prerequisite: Eng. 31. Course in Home Economics; freshman year; second semester; 3 credits; 3 recitations. Text: Boynton, *Principles of Composition*.

41. Advanced English Composition. The object of this course is to develop facility, clarity, and vigor of expression, and to increase the student's knowledge of the technique of certain types of prose discourse. The course contemplates a somewhat intensive study of the popular essay, the biography, and the criticism, as special forms of exposition, and a consideration of the short-story as a special form of narration. Exercises in analysis and in the application of the mechanics of the expository outline will be required. The written work will consist both of long and of short themes, designed to test the student's ability for organizing subject-matter and giving it effective expression.

Prerequisites: English 31, 32 or 81, 82 or 91, 92 or 85, 86. Elective for juniors and seniors; first semester; 3 credits; 3 recitations. The course will be repeated in the second semester, provided there be a sufficient demand for it. Textbook: Gardiner, *The Forms of Prose Literature*. Collateral Readings.

51. The English Essay and Novel. Study of structure of novel and essay. Study of essay and novel as expressions of national life and thought. Emphasizing the growth of the economic, critical, historical, and personal essay, and the larger categories of fiction: the novel of manners, of character, the problem novel, and the romantic novel. Class and individual assignments, lectures, and reports.

Prerequisites: Eng. 31, 32. The course in Home Economics; sophomore year; first semester; 3 credits; 3 recitations. Text: Fulton, *Essays for Use in College Courses*.

52. The English Drama. Study of the structure and technique of the drama as a distinct literary type. A survey of the rise and development of the tragedy, the comedy, and the historical play. Study of setting, plot, and character as they are employed in the drama. Reading of plays in class; collateral readings; reports on assigned topics.

Prerequisite: Eng. 31, 32. The courses in Home Economics; sophomore year; second semester; 3 credits; 3 recitations. Text: Woodbridge, *The Drama: Its Laws and Technique*.

61. The History of English Literature. A general outline course of the history of English literature. This includes a survey of the principal forms of literature as exemplified by the masters

in each field. The aim is to cultivate an appreciation of what is excellent in quality and form. Masterpieces representing the best thought and form are studied in class or assigned to students for careful reading and reports. Field of study: English literature from its beginning to the end of the eighteenth century.

Elective in all courses; first semester; 3 credits; 3 recitations. Text: Robert Huntington Fletcher, *A History of English Literature*.

62. The History of English Literature. A continuation of course 61. A study of the master minds of the nineteenth century. Lectures, readings, and discussions; critical reports on assigned topics required from all the students.

Elective in all courses; second semester; 3 credits; 3 recitations. Text: Crawshaw, *The Making of English Literature*.

71. American Literature. A study of the growth and development of literature in our country. Particular emphasis is placed on the study of writers of the nineteenth century, including such authors as Irving, Cooper, Bryant, Poe, Hawthorne, Longfellow, Holmes, and Lowell, as well as to prominent writers of the present day. Lectures; class study; class reading; reports on assigned topics; essays.

Elective in all courses; senior year; first semester; 3 credits; 3 recitations. Text: Wendell and Greenough, *History of Literature in America*.

72. American Literature. A continuation of course 71. The metropolitan writers; literature in the South; literature in the West; present schools and tendencies; periodical literature. Lectures; class-room work; reports; essays.

Elective in all courses; senior year; second semester; 3 credits; 3 recitations. Text: Wendell and Greenough, *History of Literature in America*.

81. Modern English Prose. A study of representative modern prose writers, with special reference to prose as found in such present-day standard periodicals as *The Literary Digest*, *The Independent*, and *The Outlook*. Study of the newspaper paragraph. Practice in reporting lectures. Exercises in the elaboration of field notes. Drills looking to the popularization of technical matters and the results of experiments. Drafting of resolutions; writing of syllabuses; reduction of the article to a single short paragraph and to a single sentence; analytical outlines of expository articles; finding in a controversial article the proposition upheld and its sup-

porting points; interpretation of advertisements. Writing of papers and reports. Theme writing. Oral composition.

Prerequisite: Completion of a four-years high school course. The courses in Agriculture, Mechanical Engineering, Highway Engineering, Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy. Freshman year; first semester; 3 credits; 3 recitations. Texts: Lomer and Ashmun, *The Study and Practice of Writing English*. *The Independent*; *The Outlook*; *The Literary Digest*. Woolley, *Handbook of Composition*.

82. Modern English Prose. A continuation of course 81.

The courses in Agriculture, Forestry, Logging Engineering, Mechanical Engineering, Highway and Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy.

Prerequisite: English 81. Freshman year; second semester; 3 credits; 3 recitations.

85. Modern English Prose. A course designed for students in Forestry and Logging Engineering. It includes composition and letter writing, practice in reporting lectures, exercises in the elaboration of field notes, drills looking to the popularization of technical matters, practice in oral delivery and in parliamentary procedure, and exercises in elementary Business English, with particular application to Forestry and Logging Engineering.

Freshman year; first semester; 2 credits; 1 recitation; 1 laboratory period. Text: Lomer and Ashmun, *The Study and Practice of Writing English*. Collateral reading: *American Forestry*.

86. Modern English Prose. A continuation of course 85.

Prerequisite: Eng. 85. Freshman year; second semester; 2 credits; 1 recitation; 1 laboratory period. Text: Lomer and Ashmun, *The Study and Practice of Writing English*. Collateral reading: *American Forestry*.

91. Modern English Prose. The framework of this course is the same as that employed in English 81. In its details, however, constant reference is had to the particular needs of the student in Mining Engineering.

The course in Mining Engineering; freshman year; first semester; 2 credits; 2 recitations. Text: Lomer and Ashmun, *The Study and Practice of Writing English*. Supplement: *The Electrical and Mining Engineering Journal*.

92. Modern English Prose. A continuation of course 91.

Prerequisite: Eng. 91. The course in Mining Engineering; freshman year; second semester; 1 credit; 1 recitation.

101. Special Composition. If a student, in his work in any department, submits papers notably deficient in English, either his Dean or his major professor will require him to take course 101. It consists wholly of theme work and consultations, and is continued in each case as long as the needs of the student require. This course carries no credits.

All courses; first and second semesters; 2 recitations.

103. Composition of Addresses. This course deals with the composition of the most important kinds of addresses, including the argument, the eulogy, the commemorative address, and various forms of non-forensics. The work consists of lectures, a study of textbooks, analysis of masterpieces, practice in the composition of the various forms, and frequent class-room exercises.

Elective in all courses; junior year; first semester; 2 credits; 2 recitations. Text: Baker, Forms of Public Address.

104. Extempore Speaking. Practice in the presentation of the various forms of addresses. Speeches are prepared on topics of special interest to the students and delivered with the view to making them most effective as means in the advancement of a particular cause. Extensive criticism is offered as to methods of selection, organization, and presentation.

Elective in all the courses; junior year; second semester; 3 credits; 3 recitations. Text: Baker, Forms of Public Address.

105. Practical Public Speaking. Practice in the presentation of the various forms of public addresses, voice training, study of gesture, bearing, and the elements of ease, grace, and force in presentation. Practice in the rapid preparation and in the impromptu delivery of speeches on topics of current interest. Designed for those who wish some general training in public speaking. Drill in parliamentary procedure.

Prerequisite: 104. Elective; first semester; 3 credits; 3 recitations. Text: Robinson, Effective Public Speaking.

106. Practical Public Speaking. Continuation of course 105.

Prerequisite: Eng. 105. Elective; second semester; 3 credits; 3 recitations. Text: Robinson, Effective Public Speaking.

107. Argumentation. Practical work in brief-drawing, the collection and handling of evidence, and debating. Each student will prepare several debates under the direction of the instructor, construct briefs, and participate in class room debates. Personal

consultation with the instructor on thought, composition, and delivery. This course is a critical and practical study of argumentation. The class is limited in number, and the course can be taken only with the consent of the instructor.

Elective; second semester; 2 credits; 2 recitations. Text: Foster, *Argumentation and Debate*. -

108. Oratory. This course is intended as special preparation for those who wish to enter oratorical work. The work consists of lectures on the theory of oratory, the preparation of original orations, class-room exercises, and personal conferences and criticism. The course can be taken only with the consent of the instructor.

Elective; first semester; 1 credit; 1 recitation. Text: Shurter, *The Rhetoric of Oratory*.

141. Technical English. The writing which the engineer has to do is almost wholly of the nature of exposition. Indeed, it is only in so far as it is expository that it offers any problems different from those which arise in general composition. In technical English, then, in the engineering courses, attention is centered on exposition of the various types which the engineer has to use,—description, narration, directions, criticism, and argumentation.

At all times it will be insisted on that whatever facts the student expresses, shall be expressed accurately; that the treatment of the subject shall be complete for the purpose in hand; that the form of presentation shall be logical; and that the expression shall be economical for the reader.

Prerequisite: 6 credits of college English. The courses in Engineering, Soils, and Farm Management; elective in all other courses; junior or senior year; second semester; 2 credits; 2 recitations. Text: Earle, *Theory and Practice of Technical English*.

142. Technical Business English. The preparation of the manuscript and copy for the printer. The study of and extensive practice in proof-reading. The study of the advertising circular, students being required to plan and complete circulars for various advertising purposes. Practice of writing informal trade agreements, specifications, and other business forms.

Prerequisite: Eng. 143 or its equivalent. The course in Commerce; freshman year; second semester; 3 credits; 3 recitations.

143. Advanced Commercial Correspondence. Review of the essentials of correct and effective English: clearness, interest,

proper punctuation, grammatical correctness, effective diction. The business letter in detail, special attention being given to letters of application, letters of inquiry and information, circular letters, letters of complaint, sales letters, follow-up letters, and collection letters. Study of postal regulations.

The course in Commerce; freshman year; first semester; 3 credits; 3 recitations. Text: Lewis, Business English.

191. Story-Telling. The study of children's literature, and the analysis and reproduction of short stories suitable for the primary grades, the kindergarten, and the nursery.

Elective in the course in Home Economics; senior year; first semester; 1 credit; 1 recitation.

192. Story-Telling. A continuation of course 191.

Elective in the course in Home Economics; senior year; second semester; 1 credit; 1 recitation.

206. Expression. Literary interpretation, including analysis, memorizing, and rendering of selected masterpieces of prose and poetry. The aim of this course is to enable the student not only to understand and appreciate the thought and spirit of literature, but to render it naturally and effectively, to correct erroneous habits of speech, to give freedom, purity, and strength of tone, to cultivate the power of expression through imagination, and to eliminate artificiality, affectation, and self-consciousness.

Elective; first semester; 2 credits; 2 recitations.

207. Expression. Continuation of course 206.

Elective; second semester; 2 credits; 2 recitations.

208. Dramatic Interpretation. Advanced literary interpretation. Training in delivery of masterpieces of prose and poetry. Interpretative study of Shakespeare and the modern drama; presentation of scenes from plays; bodily expression; impersonation.

Prerequisites: Course 206 and 207. Elective; first semester; 2 credits; 2 recitations.

209. Dramatic Interpretation. Continuation of course 208.

Elective; second semester; 2 credits; 2 recitations.

301. Elementary News-Writing. Instruction and training in judging news values, gathering and writing news, and newspaper correspondence. Writing news technical to Agriculture, Home Economics, Engineering, Commerce, Forestry, etc. Open to

students of junior rank and others especially recommended by the professor of English. Required as a condition of eligibility for leading positions on student publication staffs.

Elective in all courses; junior year; both semesters; 2 credits; lecture and laboratory period.

302. Advanced News-Writing. A continuation of course 301, dealing with special technical and feature writing, reporting, copy reading, editorial writing, proof-reading, make-up, and head-writing, with field work in writing specials to various publications.

Prerequisite: English 301 or its equivalent. Elective in all courses; junior or senior year; both semesters; one credit; one lecture.

315. Seminar. Study and review of the recognized masterpieces of European Continental literature in approved translations.

Elective in all courses; first semester; 2 credits; 2 recitations.

316. Seminar. A continuation of course 315.

Elective in all courses; second semester; 2 credits, 2 recitations.

E. Junior Secondary English. The object of offering this course is to afford students not having completed the English work of the third year of the secondary school an opportunity to take that work.

The course contemplates, in part, a survey of English literature, during the first and second semesters. A study is made of the characteristics of literary epochs, attention being especially directed to the shaping influence of contemporary civil events. Study of a typical masterpiece belonging to each epoch. Assigned readings, followed by oral and written reports.

The work in Rhetoric and Composition involves intensive study and practice in the four forms of discourse already studied in the first two years of the secondary school, the aim of such intensive study and practice being the establishment of the student in good usage.

No textbook is prescribed for Rhetoric and Composition; the principles of Rhetoric will be evolved from the written work prepared and presented by members of the class. The subjects of compositions, whether written or oral, will be chosen, as a rule, from the epochs surveyed, the writers studied, and the books read. Those planning to pursue the course are requested to secure, in order to have at hand a convenient reference, Brooks' two-books course in English Composition, used in the high schools of Oregon.

Prerequisite: Course J or its equivalent. The vocational course; first semester; 3 credits; 3 recitations. Text: Long, English Literature.

F. Junior Secondary English. Continuation of E. The work in written Composition requires several Expository and several Argumentative themes of such length and of such literary quality as shall thoroughly test the student's ability for sustained, consistent thinking, clear expression, and a just literary appreciation. Oral composition supplementing written, will be a feature of each week's class work. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that he writes in other departments.

Prerequisite: Eng. E. or its equivalent. The vocational course; second semester; 3 credits; 3 recitations. Courses in Home Economics and Industrial Arts; freshman year; first semester; 3 credits; 3 recitations. Text: Canby and others, Composition in Theory and Practice.

G. Vocational English. Review of English Grammar. The purpose of the work in English Grammar, as prescribed in Course G and in subsequent vocational English courses, is such an intensive study of, and persistent drill in, the fundamentals of the subject as shall establish the student in relatively correct usage. The accomplishment of this end is sought by giving the work with such frequency and by such concrete methods as shall tend to create in the student a liking for the subject of English Grammar. Identification and analysis of sentences. Punctuation. Written and oral exercises in spelling. The specific aim of written composition is the development of the sentence sense, the avoidance of the common grammatical errors in expression, and the production of a legible manuscript. Use is made of the letter as a medium for the solution of simple but actual business problems. Written reproduction of short articles. Short narrative themes. Oral composition comprehending the reproduction of articles, the explanation of processes and mechanisms, and the narration of incidents.

The course in written and oral expression is supplemented by a course of reading designed to enable the student, by helping him to acquire a command of language, the more effectively to discharge the duties of his vocation, to create pleasure for himself in

reading good books, and to develop the practice of reading into a habit for life.

The vocational course; first year; first semester; 3 credits; 3 recitations. Text: Baskervill and Sewell, *English Grammar*. Books for reading: Fowler, *Starting in Life*; *Choosing a Career*. Richardson, *The Girl Who Earns Her Own Living*.

H. Vocational English. Special attention is given, in the study of Grammar, to the identification of the parts of speech, the classification and uses of clauses, and the conjugation of the verb. Punctuation, with drill primarily on the uses of the comma. The logical arrangement of thoughts as represented in the outline will be discussed and illustrated. In written composition, the content and mechanics of the letter are given particular consideration. Exposition of concrete objects. Narrative writing. Oral composition will treat current events and subjects listed for written composition.

Prerequisite: Eng. G. Vocational course; first year; second semester; 3 credits; 3 recitations. Text: Huntington, *Elements of English Composition*. Periodical: *Current Events*. Books for reading: Hale, *What Career?* Rollins, *What Can a Young Man Do?* Alden, *Women's Ways of Earning Money*.

I. Advanced Vocational English. Study of the structure and functions of phrases; the correction of the common errors in etymology and syntax. Punctuation. Writing reports on newspaper and magazine articles; writing advertisements; drafting simple specifications. Oral composition comprehending current events, sales talks, and informal debates.

Prerequisite: Eng. I. Vocational course; second year; first semester; 3 credits 3 recitations. Text: Webster, *English for Secondary Schools*. Periodicals: *Popular Science Monthly*, *Boy's Magazine*, *Popular Mechanics*, *World Magazines*. (The student will subscribe for at least one periodical in the foregoing list.) Books for reading: Shaw, *The Outlook for the Average Man*. Reid, *Careers for the Coming Men*. Abbot, *Women and Industry*.

J. Advanced Vocational English. Modifications of the verb; drill on the sequence of tenses; practice in the detection and the correction of the more elusive forms of false syntax. Review of punctuation. The aim of the work in written composition is to improve diction, increase vocabulary, and develop greater variety,

force, and directness of expression. Reports on articles in books, magazines, and newspapers. Reports on actual business experiences. Letter writing. Oral composition involving conversations on problems in business and actual life.

Prerequisite: Eng. I. Vocational course; second year; second semester; 3 credits; 3 recitations. Text: Gardiner, Kittredge and Arnold, Manual of Composition and Rhetoric. Books for reading: Kaufman, The Efficient Age. MacLean, Wage Earning Women.

M. Elementary Business English. Besides giving a thorough training in the various forms of commercial correspondence, the course aims to ground the student in the vocabulary, forms, and usages peculiar to business and administrative pursuits. There is constant and persistent practice in spelling and punctuation, in composition and letter writing, with a view to imparting to the student's English strength and virility, and to enable him to achieve results.

Two-years Business course; second year; first semester; 3 credits; 3 recitations.

N. Elementary Business English. A continuation of course M. Advanced composition and letter writing; business forms, incidental writing; summaries; advertising; preparation of copy and proof-reading. Good, clear, effective English is at all times insisted upon.

Prerequisite: Eng. M. Two-years Business course; second year; second semester; 3 credits; 3 recitations. Text: Lewis, Business English.

HISTORY

JOHN B. HORNER, Professor

The study of history is fundamental to leadership, there being no line of human investigation that does not depend upon historic knowledge. History is required in Commerce and is offered as an elective in all other schools of the Oregon Agricultural College.

The instruction is largely given by lectures illustrated with lantern views. In the more advanced classes, each student is required to prepare at least one lecture. Although textbooks are required, the work in the various courses in history is done in connection with the college library, which is accessible to students on all week days.

The courses given at present are as follows:

30. European History. Course 30 includes the study of Europe at the time of Louis XIV; reconstruction of Europe at Utrecht; Russia and Prussia become European powers; Wars of Frederick the Great; Struggle between France and England for India; Rivalry of France and England in North America; The Old Regime in Europe; The Spirit of Reform; Enlightened Despots of the Eighteenth Century; The French Revolution; The First French Republic; Europe and Napoleon; The Reconstruction of Europe at the Congress of Vienna.

Elective; first semester; 3 credits; 3 recitations. Text: Robinson and Beard, *The Development of Modern Europe*, Vol. I.

40. Modern Europe. This course comprises a study of the following subjects: Europe after the Congress of Vienna; The Industrial Revolution; Revolution of 1848; Unification of Italy; Formation of the German Empire and the Austro-Hungarian Union; The German Empire; France under the Third Republic; Social and Political Reforms in England; British Empire in the Nineteenth Century; Russian Empire in the Nineteenth Century; Turkey and the Eastern Question; The Expansion of Europe in the Nineteenth Century; Some of the great problems of today.

The course in Commerce; sophomore year; second semester; 3 credits; 3 recitations. Text: Hazen, *Europe Since 1815*.

52. History of the British Empire. A coherent view of the larger factors influencing national development from the earliest times to the British Empire of today. Social, economic, artistic,

and intellectual growth is broadly surveyed, and is made to reveal a picture of the changing conditions of the people rather than that of the king and nobility. Legal and constitutional development is also emphasized by tracing the origin and development of English common law and by discussing the nature and importance of the great statutes. Particular attention is given to such subjects as the Industrial Revolution, Growth of the Power of the House of Commons, the Extension of the Franchise, Remedial Legislation, and Colonial and Imperial Development.

Elective; senior year; first semester; 3 credits; 3 recitations. Text: Green, History of England and Greater Britain.

62. Contemporary American History. The history of the United States from the Discovery of America to the present time. Collateral with the textbooks such matters as the negro question, the industrial revolution, capitalism and socialism, free silver, direct government, woman suffrage, the growth of judicial review, the new nationalism, imperialism, the labor movement, the progressive movement, the Panama-Colombia question, present status of the Monroe Doctrine, and our relation with the Latin-American republics, are discussed from the standpoint of history.

Prerequisite: History D or its equivalent. The course in Commerce; freshman year; second semester; 3 credits; 3 recitations. Text: Bassett, History of the United States.

70. History of Oregon. Five epochs of Oregon history. Early explorations. Fur trading and colonization. Provisional government. Territorial government. State government. Indian Folk-Lore. History of Oregon Literature. Course 70 is given in lectures.

The course in Commerce; sophomore year; first semester; elective second semester; 3 credits; 3 lectures.

80. American Diplomatic History. This course deals with the history of the chief events in American foreign affairs from the beginning of the government to the present time. Its purpose is to show the policies of our government on the same subject at different times, the causes for the changed policies, and the methods employed to work out the policies. An attempt is made to show the changed attitude of governments in their dealings with each other in the course of our national history. Throughout the course considerable attention will be given to character studies of the men leading in our diplomatic work. The ultimate aim is the application of our experience to present problems.

Elective; senior year; second semester; 3 credits; 3 recitations.

100. American Biography. A study in the public careers of typical American statesmen and other men of affairs. It is intended to cover the entire field of American history. The object is to emphasize the personal element in our national development and to become more familiar with the leaders of our economic progress. Students desiring to place especial stress upon any feature of the study may elect not to exceed 20 percent of their allotment of biographical research. (Lectures, assigned reading, and discussion.)

Elective; junior or senior year; first semester; 3 credits; 3 recitations.

110. History of South America. This course includes the history of South America, Central America, and Mexico; hence comprises the discovery, colonization and growth of Latin America. Although the dramatic story of our southern neighbors reads like a romance, the course is designed primarily to meet the requirements of Americans who desire to cultivate deeper interest in our sister republics through a broader knowledge of their political and economic development.

Elective; 3 credits; 3 recitations.

D. United States History. With special attention to the colonial, political, and industrial aspects. A brief course that covers the leading events of our history. Particularly important in Oregon since the introduction of direct legislation and equal suffrage.

Two-years Business course; first year; second semester; 3 credits; 3 recitations. Text: Channing.

LIBRARY

IDA ANGELINE KIDDER, Librarian
LUCY MAY LEWIS, Assistant Librarian
LILLIAN MABEL GEORGE, In charge Continuations Dept.
BERTHA HERSE, In charge Circulation Dept.
LILA GRACE DOBELL, Assistant
BLANCHE MARIE CLAUSMEYER, Assistant
ETHEL ALLEN, Assistant

Equipment. The Library occupies the second floor of the Administration building and one room on the first floor. The reading and general reference room is large, well lighted, and extends entirely across the building. It is supplied with about six hundred leading magazines and newspapers. Through the courtesy of the editors, a large number of farm, orchard, stock, and home journals, and country newspapers of Oregon are received regularly at the reading room. The book stacks, occupying adjacent rooms, contain 34,000 volumes of standard work of history, biography, engineering, agriculture, natural science, general literature and reference, and about 3000 reports and other publications from the Agricultural Colleges and Experiment Stations of all the states, with 50,000 bulletins and pamphlets. The library is a designated depository of United States Government publications, of which it has about 7,000 volumes. Over 2,000 of these were received as a gift from the library of the late United States Senator Dolph.

Practical use of the books has led to the establishment of small laboratory collections kept in the rooms of the following departments: General Chemistry, Agricultural Chemistry, Animal Husbandry, Agronomy, Horticulture, Botany, Forestry, Bacteriology, Zoology, Pharmacy, Commerce, and Civil, Mechanical, Electrical, and Mining Engineering. Each department library is in charge of the head of that department, to whom application must be made for the use of the books.

All books are classified and catalogued according to the Dewey decimal system. Books may be drawn for home use by all officers and students of the College. Books may be kept by the students for two weeks with the privilege of a renewal, and by officers for any reasonable time. All students have free access to the shelves of the library.

The reference library in the reading room consists of encyclopedias, dictionaries, standard reference books in the different departments of study, together with books designated by professors

for collateral reading in the various courses of instruction. A small collection of books for cultural reading is also kept in the reading room. In the same room, and accessible to all readers, is the card catalogue of the general library, including the books of the department libraries. The catalogue includes both authors and subjects under one alphabet on the dictionary plan; there is also a card catalogue of the publications of the U. S. Department of Agriculture, and a card index to the publications of the State Experiment Stations.

1. Library Practice. This course teaches, by means of lectures and practical problems, the use of catalogues, indexes, and reference books, such as dictionaries, encyclopedias, atlases, handbooks of general information, handbooks of history, statistics, quotations, etc.

All degree courses; freshman year; one semester; $\frac{1}{2}$ credit; 1 lecture; 1 recitation; 1 laboratory period each alternate week.

MATHEMATICS

CHARLES LESLIE JOHNSON, Professor
EDWARD BENJAMIN BEATY, Associate Professor
NICHOLAS TARTAR, Assistant Professor
HARRY LYNDEN BEARD, Instructor
FREDERICK CHARLES KENT Instructor

The following courses are offered:

8. Commercial Mathematics. An advanced course in commercial arithmetic, especially for students in the School of Commerce. To do successful work in this course, the student should have a thorough knowledge of all the fundamental operations of arithmetic, including the various phases of percentage and interest. Emphasis is laid on computations of the more difficult problems connected with partnership and corporation settlements, balance sheets and statements, equation of accounts, partial payments, savings bank accounts, compound interest, stocks and bonds, life insurance, and annuities, partly for the information obtained in the various subjects and partly for the drill afforded in the use of figures. Daily drills are given in short methods and rapid calculation.

The course in Commerce; freshman year; first semester; 3 credits; 3 recitations. Text: Van Tuyl, Complete Business Arithmetic.

11. Plane Trigonometry. This course includes functions of acute angles, right angles, functions of any angle, relations between functions, inverse functions, trigonometric equations, and oblique triangles. Considerable time is devoted to the deduction of trigonometric formulae, study of trigonometric identities, and the solution of practical problems.

All Engineering courses; freshman year; first three-fifths first semester; 3 credits; 5 recitations. Text: Wentworth and Smith, Plane Trigonometry.

12. Plane Trigonometry. The course in Industrial Arts, second semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Trigonometry.

14. Trigonometry. A review of algebra, including logarithms, is followed by a course similar in character to 11, except that more time is given to the solution of practical problems.

The course in Forestry; freshman year; first semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Trigonometry.

15. Spherical Trigonometry. The courses in Highway and Irrigation Engineering; freshman year; first semester; one credit; one recitation. Text: Wentworth and Smith, Spherical Trigonometry.

21. College Algebra. After a brief review of radical expressions, theory of indices, and quadratic equations, graphical representation and mathematical induction are studied.

All engineering courses; freshman year; last two-fifths of either semester; 2 credits; 5 recitations. Text: Hawkes, Advanced Algebra.

22. Algebra. A course for freshmen in Engineering who show by poor work in courses 11 or 21 that they need further preparation in algebra before continuing their mathematics.

All Engineering courses; freshman year; second semester; 5 credits; 5 recitations. Text: Hawkes, Luby, and Touton, Second Course in Algebra.

25. Practical Agricultural Mathematics. A course on the essentials of Advanced Arithmetic and Trigonometry. The Arithmetic includes a thorough drill in both common and decimal fractions; proportion; percentage, embracing interest, partial payments, discount, etc.; mensuration, including problems necessary for an agriculturist. The Trigonometry includes use and application of logarithms, the solving of problems in both right and oblique triangles, finding angles, distances, areas, etc.

The course in Agriculture; freshman year; either semester; 3 credits; 3 recitations.

31. Elementary Analysis. Under College Algebra are treated the binominal theorem, progressions, complex numbers, and the theory of equations. In analytical geometry the point, straight line, circle, conic sections, and some of the higher plane curves are studied. Considerable time is given to the plotting of curves in both rectangular and polar coordinates.

Prerequisites: Trigonometry and College Algebra. All Engineering courses; freshman year; either semester; 5 credits; 5 recitations.

34. Elementary Analysis. This course is similar to 31, but shorter. Particular emphasis is given to curve plotting in both rectangular and polar coordinates.

Prerequisite: Trigonometry. The course in Forestry; freshman year; second semester; 3 credits; 4 recitations. Text: Granville and Smith, Elementary Analysis.

41. Plane Analytic Geometry. Course 41 is offered to students who enter the sophomore year deficient in Analytic Geometry. The topics studied are the point, the straight line, polar coordinates, transformation of coordinates, the circle, conic sections, tangents, diameter, poles and polars, discussions of general equations of the second degree, problems in loci, and higher plane curves.

All Engineering courses; sophomore year; first semester; 3 credits; 3 recitations.

51. Differential Calculus. Among the subjects presented are: differentiation and applications, evaluation of indeterminate forms, expansion of functions, Taylor's and Maclarin's theorems, maxima and minima, points of inflection, curvature, change of independent variable, functions of two or more variables, asymptotes, curve tracing, etc.

All Engineering courses; sophomore year. Elective for juniors and seniors in other courses; either semester; 4 credits; 5 recitations. Text: Granville, Differential and Integral Calculus.

52. Integral Calculus. Among the topics considered are: direct integration, definite integrals and applications; integration by parts, integration of trigonometric forms, etc.; applications to finding of lengths and areas of curves, surfaces, and volumes of solids of revolution, etc.; double and triple integration and applications. In this course, as in course 51, great stress is laid upon practical applications, and a large number of practical problems are solved.

All Engineering courses; sophomore year. Elective for juniors and seniors in other courses; second semester; 4 credits; 5 recitations. Text: Granville, Differential and Integral Calculus.

61. Differential Equations. A study of the solution of ordinary and partial differential equations which the Engineering student is likely to encounter.

Prerequisites: Courses 51, 52. Elective; junior year; first semester; 3 credits; 3 recitations. Text: Campbell, Differential Equations.

71. Method of Least Squares.

Prerequisites: Courses 51, 52. Elective; junior year; second semester; 2 credits; 2 recitations. Text: Merriman, Method of Least Squares.

81. Hyperbolic Functions.

Prerequisites: Courses 51, 52. Elective; junior or senior years; second semester; 2 credits; 2 recitations. Text: McMahon, Hyperbolic Functions.

91. Mathematical Theory of Investment. This course treats of the theory of long-time investments, and includes the most important applications of mathematics to financial problems.

It will be thoroughly practical in its treatment, and while arranged to meet the needs of students in Commerce, is open to juniors and seniors of all courses.

Elective; junior and senior years of all courses; either semester; 3 credits; 3 recitations.

A. Algebra. The work of the course includes a drill in the fundamental operations, use of parentheses, special rules of multiplication and division, factoring, highest common factor, lowest common multiple, and fractions.

The Mechanic Arts course; first year; either semester; 5 credits; 5 recitations. Text: Hawkes, Luby, and Touton, First Course in Algebra.

B. Algebra. The topics studied are solution of fractional and literal equations, problems involving linear equations, simultaneous linear equations, involving two or more unknown numbers, problems involving simultaneous linear equations, graphical representation, inequalities, involution, evolution, theory of exponents, radical expression, and imaginary numbers.

The Mechanic Arts course; first year; either semester; 5 credits; 5 recitations. Text: Hawkes, Luby, and Touton, First Course in Algebra.

C. Algebra. Required of freshmen in Engineering who enter with but one year of Algebra.

Either semester; 3 credits; 3 recitations. Text: Hawkes, Luby, and Touton, First Course in Algebra.

D. Plane Geometry. Course D includes the first two books of Plane Geometry. The constant aim is to develop in the student.

the power of logical reasoning, and of clearness and accuracy of expression. To this end, many original exercises are studied, and at all times demonstrations and proofs are freely discussed in the class room. Required of freshmen entering deficient in first semester of Plane Geometry.

Either semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Geometry.

E. Plane and Solid Geometry. A continuation of course D, arranged for freshmen in Engineering who enter deficient in the second semester of Plane Geometry.

Second semester; 5 credits; 5 recitations. Text: Wentworth and Smith, Plane and Solid Geometry.

F. Solid Geometry. Required of all Engineering freshmen who are deficient in Solid Geometry.

Freshman year; first semester; 2 credits; 3 recitations. Text: Wentworth and Smith, Solid Geometry.

G. Plane Geometry. Courses G and H are arranged for freshmen who enter deficient in the second semester of Plane Geometry, and who desire to use both semesters to make up the condition. The two courses are equivalent to course K.

Freshman year; first semester; $1\frac{1}{2}$ credits; 2 recitations. Text: Wentworth and Smith, Plane Geometry.

H. Plane Geometry. A continuation of course G.

Freshman year; second semester; $1\frac{1}{2}$ credits; 2 recitations. Text: Wentworth and Smith, Plane Geometry.

K. Plane Geometry. A continuation of course D, covering the last three books of Plane Geometry. Many original exercises are studied. Required of freshmen, except those in Engineering, who enter deficient in second semester of Plane Geometry.

Either semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Geometry.

L. Plane Geometry. A course arranged to meet the needs of students in Mechanic Arts.

The course in Mechanic Arts; second year; second semester; 4 credits; 5 recitations. Text: Wentworth and Smith, Plane Geometry.

M. Commercial Arithmetic. A review of all the essential operations. Special stress is laid on short methods; daily drills in

rapid calculation; computation of estimates; partnership settlements, etc.

The two-years Business course; first year; first semester; 3 credits; 5 recitations. Text: Van Tuyl, Essentials of Business Arithmetic.

N. Commercial Arithmetic. A continuation of course M.

The two-years Business course; first year; second semester; 3 credits; 5 recitations; Text: Van Tuyl, Essentials of Business Arithmetic.

O. Shop Arithmetic. A thorough drill in the principles of arithmetic, with special application to shop problems of all sorts.

The course in Mechanic Arts; second year; first semester; 4 credits; 5 recitations. Text: Bolton, Shop Mathematics.

R. Farm Arithmetic. An elective course for students in the vocational course in Agriculture who feel the need of a review of arithmetic. A practical text dealing with problems of the farm will be used.

The vocational course in Agriculture; second semester; 3 credits; 3 recitations. Text: Burkett and Swartzel, Farm Arithmetic.

T. Geometry and Trigonometry.

The course in Mechanic Arts; third year; first semester; 4 credits; 5 recitations.

MILITARY SCIENCE AND TACTICS

THOMAS FRANCIS MAGINNIS, Captain, U. S. Army, Retired, Commandant, Professor of Military Science and Tactics.

*DENIS HAYES, Captain, Adjutant General's Department, National Army.

*CYRUS FRANKLIN DUGGER, First Lieutenant, Adjutant General's Department, National Army.

The General Government founded Agricultural and Mechanical Colleges to meet the conditions of both peace and war. The education of the citizen, indeed, to be complete, requires him to be trained for both peace and war. In putting this into practice the General Government has acted on the theory that a college training is a military asset, that college men are training themselves for leadership, and that the training at Agricultural and Mechanical Colleges coordinates closely with military training. The cadet is taught that military training is both mental and physical. That mental military training is: first, to determine the objective; second, to analyze, organize, and systematize action by putting in practice the Five General Tactical Principles that state what lines of action must be followed in gaining any objective, either in peace or war; third, to study and think out the methods — technical or otherwise — that best put into practice the lines of action laid down in the Five General Principles. The mental habits thus formed are as necessary in peace as in war and in this way military training coordinates with and is helpful to the training in other courses. Discipline is based on control; control is based on training; training is based on team work. The cadet is taught that acts of authority as well as acts of obedience are acts to promote team work. This impersonal teaching is of utmost value to the cadet, teaching him that authority has no arrogance and that obedience is not servility. The greater part of the cadets' life will be passed in obeying, or commanding, so this training is for every-day use. The cadet is taught that a poor physical appearance comes from, or is caused by, a poorly or improperly developed physique. Military service has always required a good all-round physique and so from the first military training has been designed to develop and better the physical condition.

The objective of the military course is to train the cadet to be able to perform the duties of an officer in enlisting, feeding, equipping, caring for, drilling, and training a company. His ability as a tactical instructor is the most important factor.

*On leave of absence.

The College, conforming to the spirit of law, has provided an efficient system of military instruction for training cadets to become officers. The Congressional Land Grant Act of 1862 requiring military instruction, was passed during a critical period in the life of the Nation while it was engaged in a civil war. The best of evidence was then at hand showing the need of trained officers for citizen soldiers. The object of the law, therefore, was to provide well-trained officers for citizen soldiers.

The military body of this College consists of one regiment of infantry, a hospital corps, signal corps detachment, and a band of fifty instruments. The drill training and administration are about the same as for officers in the Regular Army.

Instruction in the course is prescribed for all undergraduate male students. The instruction is both practical and theoretical.

Reserve Officers' Training Corps. General Order 49, War Department, 1916, providing for the establishment of the Reserve Officers' Training Corps, has been in operation at the Oregon Agricultural College since the beginning of the year 1917.

The object of the R. O. T. C. is to qualify students, by systematic and standard training methods, to be commissioned in the Officers' Reserve Corps so that in time of national emergency, trained men, graduates of the College, may lead units of the large armies on which the safety of the country will depend.

All physically fit male students, citizens of the United States, on entering the College, unless excused for proper cause by the College authorities, are members of the Reserve Officers' Training Corps. The first two years of military training in this or an equivalent institution constitute the Basic Course. Such men as show a proper interest and aptitude during membership in the Basic Course are permitted to enter the Advanced Course. The Advanced Course consists of the third and fourth years of military training at this or an equivalent college.

A yearly allowance of \$14.00, in the nature of commutation of uniform, is made to each member of the basic and advanced courses. In addition the Government makes an allowance of 30 cents a day, as commutation of subsistence to each member of the advanced course. This allowance is paid quarterly and covers the two years at College during membership in the advanced course, and in addition the vacation, except during time spent at camp, coming between the third and fourth years.

The student is not required by reason of membership in the Reserve Officers' Training Corps to enter into any agreement to continue in College a definite length of time. He has the same liberty to leave College as though he were not a member. In order to be eligible to membership in the advanced course, however, he must agree to attend two summer training camps for a period of four weeks each providing he remains in College. These camps, in the regular order, will come at the end of his third and fourth years of military training. He may, however, under certain regulations, substitute camps at the end of his first or second year for the required camps in the advanced course. No regulation will require him to do this. It is an arrangement which may be made for his convenience or advantage.

The summer training camps are organized by bringing together the students from the different colleges which maintain units of the R. O. T. C. These camps will be most interesting and instructive. The Government makes an additional allowance for clothing to men who attend. It also furnishes them transportation to and from the camp of instruction, or mileage therefor at the rate of 3½ cents per mile. Excellent food is provided. Moral conditions are carefully controlled by the regular army officers in charge. In short, the camps together with the other military instruction the student gets, not only offer every opportunity for his physical and mental development, but offer it at no expense to him. During the past year, indeed, the War Department has paid out through the Commandant's office, to members of the Reserve Officers' Training Corps at Oregon Agricultural College, something over \$17,500.00, a very substantial help to the men who are attending the Institution.

The Oregon Agricultural College is classified by the War Department as a "distinguished college." This honor was first won by the Cadet Regiment during the 1916-17 school year, and the men of the Regiment intend that it shall not be lost. Interest in military work is constantly increasing and the zeal and spirit of the students is most satisfactory to the College authorities.

The new armory contains a drill room 120x300 feet in extent, ample office room, and suitable rooms for storage of guns and other ordnance.

Eight hundred and forty U. S. magazine rifles, with equipment and ammunition, are furnished by the U. S. Government. Other necessary accoutrements and apparatus for the thorough equip-

ment of the military department are furnished by the College, or the U. S. Government.

Appointment and promotion of officers and non-commissioned officers, and their relative rank in each grade, are determined according to the military standing of the cadets, based upon a careful consideration of the following points: knowledge of drill and other duties, practical application of this knowledge on the drill field, and recommendations of superior officers; zeal, soldierly bearing, and aptitude for command; character; military record; general standing in College.

Commissioned officers are selected from the senior class or from such students as have had three or more years of drill; Sergeants from seniors or juniors, or cadets having two or more years drill; Corporals from juniors or sophomores, or cadets having had one or more years drill. All appointments and promotions of commissioned officers are made by the Commandant, with the approval of the President of the College.

Work in military drill is required of all male students of the institution, including all regular degree students, and all vocational, special, and optional students, except short course Forestry students, four periods a week throughout their undergraduate course. Senior privates may, however, upon petition approved by the President of the College, be excused.

One credit a semester is allowed for military drill, and grades are reported at the end of each semester the same as in any other subject.

Students physically unable to participate in the regular military drill may be assigned by the Commandant to light duty in the department.

Persons transferring to the Oregon Agricultural College with advanced credits from other educational institutions of equal rank will not be exempt from the military requirements, but will be required to offer an equivalent of credits for the back military credits represented or accumulated.

Persons presenting credentials for military work taken at other educational institutions, or for service in the U. S. Army, may be given credit for such work in so far as it is deemed equivalent to the requirements of this institution.

If for any reason a student is relieved from the military requirements, except as specified above, other credits must be substituted therefor.

Paragraph 24, General Orders No. 70, War Department, November 18, 1913, directs that, "Upon occasions of Military Ceremony, in the execution of drills, guard duty, and when students are receiving any other practical military instruction, they shall appear in the uniform prescribed by the institution. They shall be held strictly accountable for the arms and accoutrements issued to them."

The Commandant has general charge of all matters pertaining to the uniform. The cost of the complete uniform during the past year was \$25.50. The uniform consists of cap, coat, breeches, leggins, and shoes, of material of the same quality as that used by the U. S. Army. It is not advisable for men to purchase any of these articles before entering the College, as only articles of regulation texture and uniformity of style and color are permitted. They can all be supplied at the College cheaper than they can be bought at retail prices by the individual outside.

The student must come prepared to deposit the price of the uniform. Upon the completion of each semester of the college year he will have refunded to him \$7 in cash, which is one-half of the government allowance for the year.

Proficiency in the Military department is a requisite to graduation.

The drill hours during the days Monday to Friday are the same for all members of the Reserve Officers' Training Corps. One credit for each semester's drill is given. Two additional credits per semester may be secured for Military Drill Saturday mornings. This Saturday morning drill is optional with the student. Members of the faculty are cooperating with the Military department and are giving, on Saturday mornings, courses in various essentially military subjects as follows: Camp Sanitation, Gas Engines, Mining and Explosives, Military Engineering, Military Practice, Landscape Sketching, Mapping, Hippology, and Camp Cookery, which are also optional with the student, and for which appropriate credits are given. These courses have proved very popular with the students and are of decided military value. Many other subjects are listed in the regular College schedule which are of prime military value. Shops and laboratories are well equipped and the College is offering every opportunity to men who may wish to make a special study to equip themselves for military service.

During the year 1917-18 the drill period was increased by the College authorities beyond the demands of the War Department. The fact that 97 percent of the members of the cadet regiment

signified their desire, at the end of the year for the continuance of the increased period is an indication of the general demand by the student body for the work and of the spirit with which these men are fitting themselves for service to the country.

Military Drill 1. Freshman year; first semester; 1 credit.

Military Drill 2. Freshman year; second semester; 1 credit.

Military Drill 3. Sophomore year; first semester; 1 credit.

Military Drill 4. Sophomore year; second semester; 1 credit.

Military Drill 5. Junior year; first semester; 1 credit.

Military Drill 6. Junior year; second semester; 1 credit.

Military Drill 7. Senior year; first semester; 1 credit.

Military Drill 8. Senior year; second semester; 1 credit.

Military Drill 9. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. First semester; 1 credit.

Military Drill 10. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. Second semester; 1 credit.

Military Drill A. First semester; first year; Vocational course; 1 credit.

Military Drill B. Second semester; first year; Vocational course; 1 credit.

Military Drill C. First semester; second year; Vocational course; 1 credit.

Military Drill D. Second semester; second year; Vocational course; 1 credit.

Military Drill E. First semester; third year; Vocational course; 1 credit.

Military Drill F. Second semester; third year; Vocational course; 1 credit.

Special and optional students will be given credits in military drill as indicated above for undergraduate students. For their first semester's drill work they will be given credits in Military Drill 1. For their second semester's drill work they will be given credit in Military Drill 2. In the following years they will be given credits correspondingly.

THEORETICAL INSTRUCTION

Military Science 1. Junior year; first semester; 1 credit; 1 hour a week, lecture or quiz and tactical problem.

Military Science 2. Junior year; second semester; 1 credit; 1 hour a week, lecture or quiz and tactical problem.

Military Science 3. Senior year; first semester; 1 credit; 1 hour a week on duties pertaining to their office or on tactical problem work.

Military Science 4. Senior year; second semester; 1 credit; 1 hour a week on duties pertaining to their office or on tactical problem work.

The course of training given bellow is the minimum course for all cadets of the Oregon Agricultural College, except those specializing in some military study or those not physically qualified. It is the Reserve Officers' Training Course.

COURSE OF TRAINING FOR THE INFANTRY UNITS

Basic Course—

Advanced Course—

Freshmen.....	1 and 2	Juniors.....	5 and 6
Sophomores.....	3 and 4	Seniors.....	7 and 8

1. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

Physical drill (Manual of Physical Training—Koehler); Infantry drill (U. S. Infantry Drill Regulations), to include the School of the Soldier, Squad and Company, Close and Extended order. Preliminary instruction sighting position and aiming drills, gallery practice, nomenclature and care of rifle and equipment.

(b) Theoretical. Weight 4.

Theory of target practice, individual and collective (use of landscape targets made up by U. S. Military Disciplinary Barracks, Fort Leavenworth, Kans.); military organization (Tables of Organization); map reading; service of security; personal hygiene.

2. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

Physical drill (Manual of Physical Training—Koehler); Infantry drill (U. S. Infantry Drill Regulations), to

include School of Battalion, special attention devoted to fire direction and control; ceremonies; manuals (Part V, Infantry Drill Regulations); bayonet combat; intrenchments (584-595, Infantry Drill Regulations); first-aid instruction; range and gallery practice.

(b) Theoretical. Weight 4.

Lectures, general military policy as shown by military history of United States and military obligations of citizenship; service of information; combat (to be illustrated by small tactical exercises); United States Infantry Drill Regulations, to include School of Company; camp sanitation for small commands.

3. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

The same as course 2 (a). Combat firing, if practicable, but collective firing should be attempted in indoor ranges by devices now in vogue at United States Disciplinary Barracks.

(b) Theoretical. Weight 4.

United States Infantry Drill Regulations, to include School of Battalion and Combat (350-622); Small-Arms Firing Regulations; lectures as in (b) course 2; map reading; camp sanitation and camping expedients.

4. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

The same as course 2 (a); signaling; semaphore and flag; first-aid. Work with sand table by constructing to scale intrenchments, field works, obstacles, bridges, etc. Comparison of ground forms (constructed to scale) with terrain as represented on map; range practice.

(b) Theoretical. Weight 4.

Lectures, military history (recent); service of information and security (illustrated by small tactical problems in patrolling, advance guards, rear guards, flank guards, trench and mine warfare, orders, messages, and camping expedients); marches and camps (Field Service Regulations and Infantry Drill Regulations).

5. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Duties consistent with rank as cadet officers or non-commissioned officers in connection with the practical work and exercises laid down for the unit or units. Military sketching.

(b) Theoretical. Weight 11.

Minor tactics; field orders (studies in minor tactics, United States School of the Line); map maneuvers. Weight 8. Company administration, general principles (papers and returns). Weight 1.

Military history. Weight 2.

6. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Same as (a) course 5. Military sketching.

(b) Theoretical. Weight 11.

Minor tactics (continued); map maneuvers. Weight 8.

Elements of international law. Weight 2.

Property accountability; method of obtaining supplies and equipment (Army Regulations). Weight 1.

7. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Duties consistent with rank as cadet officers or non-commissioned officers in connection with the practical work and exercises scheduled for the unit or units. Military sketching.

(b) Theoretical. Weight 11.

Tactical problems, small forces, all arms combined; map maneuvers; court-martial proceedings (Manual for Courts-martial).

International relations of America from discovery to present day; gradual growth of principles of international law embodied in American diplomacy, legislation, and treaties.

Lectures: Psychology of war and kindred subjects.

General principles of strategy only, planned to show the intimate relationship between the statesman and the soldier (not to exceed 5 lectures.).

8. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Same as course 7 (a).

(b) Theoretical. Weight 11.

Tactical problems (continued); map maneuvers. Rifle in war.

Lectures on military history and policy.

It is presumed that each member of the Reserve Officers' Training Corps during his academic course has taken one course or equivalent credit in either French, or German, or Spanish.

Special courses can no doubt be arranged at each institution so that specialists will be developed for duties other than those prescribed for reserve officers of the mobile arms.

MODERN LANGUAGES

LOUIS BACH, Professor
MELISSA MARGARET MARTIN, Instructor

The department of Modern Languages is prepared to offer courses of three years in French, German, and Spanish.

In harmony with all other courses of the College, the final aim of the instruction is practical use for the various spheres of activity and pursuits of life. While the disciplinary and cultural values of language study are duly recognized and emphasized, the predominant purpose, all the time and everywhere, is the development of personal power for social service.

The method of teaching suits the end in view. It is independent, to a great extent, of the textbooks used, much time being spent on oral drill, and each new point of theory being illustrated by copious examples and conversational exercises. Ear, eye, and tongue are equally trained. The study of grammar, at the same time, is made to serve as a course in applied logic. Learning all about subject, predicate, and object, together with their various modifiers, rendering a clear account of the relations that words bear to one another, when put together in sentences, the student necessarily brings order into his reasoning power, substituting definite, fundamental conceptions for vague and hazy fancies. Furthermore, by constantly comparing new words and modes of expression with similar ones in his own language, by applying familiar grammatical principles to a new field of effort, by abundant translating from one idiom into the other, the student is sure to gain a deeper and more comprehensive understanding of modern English than could be obtained in any other way. Appreciation comes through comparison.

A certain amount of specified work in a language is definitely required by some departments. In other departments, German, French, or Spanish may be taken as electives, and when so taken, the student receives full credit for one year's work.

Students who have had two years of high-school German, French, or Spanish, are ready to enter the corresponding second year class in College, one year's work in College being equivalent to two years in the high school. With one year's work in the high school, the student is entitled to enter the second semester of the first year class.

All the courses offered may be taken up at the beginning of either semester.

FRENCH

101. Elementary French. Grammar, oral and written exercises; reading of easy prose.

First semester; 3 credits; 3 recitations.

102. Elementary French. A continuation of course 101.

Prerequisites: Mod. Lang. 101 or one year of high-school French. Second semester; 3 credits; 3 recitations.

103. Intermediate French. Advanced grammar, composition, reading of narrative, description and scientific prose; conversational exercise on all sorts of topics.

Prerequisites: Mod. Lang. 101 and 102, or two years high-school French.

104. Intermediate French. Continued; the same plan of work as course 103.

Prerequisites: Mod. Lang. 101, 102, 103. Second semester; 3 credits; 3 recitations.

107. Advanced French. Selections from the various classes of literature specially suited to the particular needs of the class. Composition and conversational exercises based on the texts in use.

Prerequisites: Mod. Lang. 101, 102, 103, 104. First semester; 3 credits; 3 recitations.

108. Advanced French. Continued on the same plan as course 107.

Prerequisites: Mod. Lang. 101, 102, 103, 104, 107. Second semester; 3 credits; 3 recitations.

GERMAN

201. Elementary German. Grammar, oral and written exercises, reading of easy prose.

First semester; 3 credits; 3 recitations.

202. Elementary German. A continuation of course 201.

Prerequisite: Mod. Lang. 201 or one year high-school German. Second semester; 3 credits; 3 recitations.

203. Intermediate German. Advanced grammar, composition, reading of narrative, descriptive and scientific prose; conversational exercises on all sorts of topics.

Prerequisite: Mod. Lang. 201, 202, or two years high-school German. First semester; 3 credits; 3 recitations.

204. Intermediate German. A continuation of course 203.

Prerequisites: Mod. Lang. 201, 202, 203. Second semester; 3 credits; 3 recitations.

207. Advanced German. Reading of texts from the various classes of literature, composition and conversational exercises on the texts used.

Prerequisites: Mod. Lang. 201, 202, 203, 204. First semester; 3 credits; 3 recitations.

208. Advanced German. A continuation of course 207.

Prerequisites: Mod. Lang. 201, 202, 203, 204, 207. Second semester; 3 credits; 3 recitations.

SPANISH

301. Elementary Spanish. Grammar, oral and written exercises, reading of easy prose.

First semester; 3 credits; 3 recitations.

302. Elementary Spanish. A continuation of course 301.

Prerequisite: Mod. Lang. 301 or one year high-school Spanish. Second semester; 3 credits; 3 recitations.

303. Intermediate Spanish. Advanced grammar; composition; reading of narrative and descriptive texts; conversational exercises on all sorts of topics.

Prerequisites: Mod. Lang. 301, 302, or two years high-school Spanish. First semester; 3 credits; 3 recitations.

304. Intermediate Spanish. A continuation of course 303.

Prerequisites: Mod. Lang. 301, 302, 303. Second semester; 3 credits; 3 recitations.

307. Advanced Spanish. Reading of texts from various classes of literature; composition and conversational exercises based on the texts in use.

Prerequisites: Mod. Lang. 301, 302, 303, 304. First semester; 3 credits; 3 recitations.

308. Advanced Spanish. A continuation of course 307.

Prerequisites: Mod. Lang. 301, 302, 303, 304, 307. Second semester; 3 credits; 3 recitations.

PHYSICAL EDUCATION FOR MEN

ALFRED DAVID BROWNE, Director
JOSEPH AMOS PIPAL, Professor of Intercollegiate Athletics
HOVEY CLYDE McDONALD, Instructor
FRED STUTZ, Assistant

Because physical health determines capacity for efficiently carrying out the work which a student prepares for in college, the importance of physical education in the modern educational institution is being emphasized more and more every year.

Physical Education in the Oregon Agricultural College includes the following subjects: (1) Gymnastics, Individual and Class Instruction, (2) Athletics, Intercollegiate and Intramural, (3) Physical Examinations, (4) Corrective Exercises, (5) Hygiene, (6) Physical-Training Subjects not classified, (7) Teachers' Course in Physical Education.

Individual Instruction. This is given in the form of advice based upon the health examination of the student. Health examinations are given during the freshman and sophomore years. The examinations are utilized for the purpose of finding defects whose proper treatment may add to the health efficiency of the student. Advice given at this time is recorded and when a student reports for conference the advice on file is followed up. Students found with remedial physical defects are given special work of such a nature as the condition demands.

Physical Training. All students may elect any one of the three divisions in physical training.

Intercollegiate Athletics. All intercollegiate athletics are under the jurisdiction of the Board of Control composed of three members of the faculty, five members of the student body, and one alumnus. Representative teams are organized for baseball, basketball, cross-country running, football, soccer, tennis, track, and wrestling. Participation during the whole season of sport is accepted for one semester credit in physical training.

Intramural Athletics. The division of Intramural Athletics is supervised by a council consisting of the Director of Physical Education, Colonel of the Cadet Regiments, President of the Student Body, Editor of the Student Barometer, Professor of Intercollegiate Athletics, and a representative elected by each group of the Fraternities, Clubs, and Independents.

The department has organized this division so that every student who is physically fit to take part in athletic contests has the opportunity to participate in competitive scheduled sports. "Every O. A. C. man an athlete" is the slogan of the College.

For credit, attendance of two hours each week is required of all freshmen and sophomores who elect this subject. This division includes: **fall sports**; football, soccer, cross-country running, field events, swimming, tennis, fall baseball; **winter sports**; basketball, track and field events, wrestling, boxing, hand ball, volley ball, swimming, and advanced gymnastics; **spring sports**; baseball, track and field events, tennis, swimming, and cross-country running.

Gymnasium Classes. Individual and class instruction. Students who are unfit (determined by examination and tests) for work in the intercollegiate or intramural divisions, are assigned to the gymnasium classes, in which the students are given work for correcting defects, and for developing physical efficiency and muscular power.

Attendance of two hours each week is required of all freshmen and sophomores assigned to this division.

Equipment. The new Men's Gymnasium, two units of which have been completed is equipped with all modern gymnastic apparatus and facilities for properly carrying on the work of physical education and recreation. The main floor, 90x150 feet in dimensions, furnishes ample space for the most efficient type of gymnasium and indoor athletic work.

Features of the new gymnasium are: the large floor space providing for three regulation basketball courts, the large lobby for receptions, locker rooms and lockers to accommodate the men students, and shower bath and dressing rooms, rooms for accommodating the varsity and varsity teams. The new east wing provides an auxiliary gymnasium for apparatus work, three hand-ball courts, two wrestling and boxing rooms, and one large room for volley ball.

The O. A. C. field for athletics comprises a new quarter-mile track, varsity football field with bleachers for seating eight thousand spectators, one varsity baseball field, and six football, soccer, and baseball fields for intramural athletics.

Eight tennis courts have been constructed which afford adequate facilities for tennis.

The Armory, one of the largest of its kind in the United States, provides fine facilities for winter training during inclement weather in football, track, baseball, and various other sports. An indoor clay track, banked at the turns, which is but eight laps to the mile, and the extension clay floor space and high dome roof furnish facilities for conducting large winter track and field meets.

The swimming pool in the Y. M. C. A. Building is under the direction of the department and is supervised by an instructor.

The Treasurer's receipt for the \$1.50 physical-training fee entitles the holder to registration for full privileges of the department including: health examination, strength tests, locker, use of shower rooms, towels and soap, athletic fields, gymnasiums, etc.

TEACHERS' COURSE IN PHYSICAL EDUCATION

Many students expect to take up the profession of teaching after graduation from college. There is a great demand for full-time teachers of physical education in the high schools of the Pacific states. California has just passed a law requiring the employment of physical-training teachers for all high schools of the State. A bill is now being formed to be presented to the next legislature of Oregon for required public-school physical training. In anticipation of the increased demand for specialized teachers the department of Physical Education will arrange courses for training students for full-time teaching as well as for part-time teaching of Physical Education in connection with other subjects the schools.

COURSES IN PHYSICAL EDUCATION FOR MEN

The following courses are offered:

11. First year Vocational, physical training; first semester; 2 periods; $\frac{1}{2}$ credit. Required.
12. First year Vocational, physical training; second semester; 2 periods; $\frac{1}{2}$ credit. Required.
13. Second year Vocational, physical training; first semester; 2 periods; $\frac{1}{2}$ credit. Required.
14. Second year Vocational, physical training; second semester; 2 periods; $\frac{1}{2}$ credit. Required.
15. Freshman year, physical training; first semester; 2 periods; $\frac{1}{2}$ credit. Required.

16. Freshman year, physical training; second semester; 2 periods; $\frac{1}{2}$ credit. Required.

17. Sophomore year, physical training; first semester; 2 periods; $\frac{1}{2}$ credit. Required.

18. Sophomore year, physical training; second semester; 2 periods; $\frac{1}{2}$ credit. Required.

19. **Hygiene.** This course consists of a series of lectures on personal and impersonal hygiene, sources and modes of infectious diseases, immunity, industrial, and occupational diseases, etc.

Required of freshmen and vocational students; first semester; $\frac{1}{2}$ credit.

20. **Hygiene.** A continuation of course 19.

Required of freshmen and vocational students; second semester; $\frac{1}{2}$ credit.

ELECTIVE SUBJECTS IN THE TEACHERS' COURSE IN PHYSICAL EDUCATION

100. **Physical Diagnosis.** Physical department methods; history of Physical Education; school-room, school-yard, and playground plays and games; school hygiene and preventive medicine; special methods.

The course in Physical Education; first semester; 2 credits; 2 lecture periods; 4 practice hours each week.

101. **Methods of Coaching.** Methods of coaching in football, baseball, track, basketball, boxing, wrestling, and swimming.

Prerequisite: Phys. Ed. 100. The course in Physical Education; second semester; 2 credits.

102. **Elementary and Advanced Gymnastics.** Theory and practice.

The course in Physical Education; first semester; 1 credit; 2 hours each week.

103. **Elementary and Advanced Gymnastics.** A continuation of course 102.

The course in Physical Education; second semester; 1 credit; 2 hours each week.

104. **Red Cross Certificate, Aid to Injured.** A course for men.

The course in Physical Education; first semester; 1 credit; 1 hour each week.

105. Red Cross Certificate, Aid to Injured. A course for women.

The course in Physical Education; second semester; 1 credit; 1 hour each week.

106. Kinesiology. Essentials of anatomy as related to physical education. Muscles and their actions; analysis of the movements of the body, and their mechanism as a working basis for the selection of gymnastic exercises; lectures and demonstrations on skeleton and human body.

The course in Physical Education; first semester; 2 credits; 2 hours each week.

107. Therapeutic Gymnastics. Signs and symptoms indicating defects, with tests for their detection. Elements of corrective gymnastics; methods and exercises used for corrective and therapeutic purposes; types of variations from the normal, and the effect of corrective exercises.

Prerequisite: Phys. Ed. 106. The course in Physical Education; second semester; 2 credits; 2 hours each week.

108. Practice Teaching. Students will work under supervision as assistants in various courses. Conferences will be held with the instructors in charge, and reports submitted.

The course in Physical Education; first semester; 1 credit; 3 hours each week.

109. Practice Teaching. A continuation of course 108.

The course in Physical Education; second semester; 1 credit; 3 hours each week.

Students, before registering, should consult with the Director of Physical Education in the main office of the Men's Gymnasium Building.

PHYSICAL EDUCATION FOR WOMEN

_____, Professor
EVA BRUNELL, Instructor
LAURA CAMPBELL, Instructor
CHARLOTTE MACDOUGALL, Instructor

Purpose. The aim of this department is to bring each student to her best possible physical condition, and by a careful system of gymnastic training to correct faulty posture, to aid in the formation of habits of hygienic living, to establish a normal condition in the circulatory and respiratory systems, to secure bodily vigor, and to attain a healthy and symmetrical development, rather than the greatest increase in mere muscular power.

Special Corrective and Medical Gymnastics. Students who are shown by their physical examinations to be unfit for the work of the regular classes in gymnastics and sports, or to have physical defects, will be assigned to corrective classes where the work is light and the emphasis is laid on correct breathing and posture, relaxation and rest; or, whenever necessary, students will be given private work in medical or corrective gymnastics according to their individual needs. Thus the physical condition of each student is carefully diagnosed and supervised. The instructors encourage conferences concerning matters of health and personal hygiene and cooperate with the resident physician in all cases.

Requirements. Work in physical education is required of all women four periods a week in all full-years, special, optional, music and vocational courses, regardless of the student's course or classification. One credit a semester is granted for this work. For juniors and seniors who have completed courses 5, 6, 7, and 8, (two years regular work) the courses will be made elective or optional for women who pass a satisfactory physical examination and have a correct posture and carriage. Corrective gymnastics will be prescribed for all others, credit being allowed on the basis indicated above. At least four credits are required in Physical Education toward graduation.

Persons presenting credentials of work in physical education taken elsewhere may be given credit for such work in so far as it is equivalent to the requirements of this Institution.

Costumes. In order that the gymnasium costumes be hygienic and uniform, a regulation suit and shoes are required of all students. The shoes, orthopedic, are sold by the local dealers, subject

to the approval of the director; price \$3.50. The suits should be ordered at the gymnasium office, immediately upon arrival at the College. Good second-hand uniforms of outgoing girls will be for sale at about \$5.00, while the new uniforms cost \$6.00.

The Women's Gymnasium is equipped with lockers and dressing rooms and has accommodations for every College woman. A room for corrective gymnastics and a rest room, on the ground floor, are adequately equipped for their respective purposes. In the shower-bath room, hot and cold water is available throughout the year, and free towels are furnished to the students. The floor of the gymnasium is surrounded by a balcony running-track, and a capital playing space is provided for basketball and other indoor games.

The equipment includes horizontal bars, vaulting horses and bucks, parallel bars, swinging rings, traveling rings, Swedish box, stall bars, climbing ropes, ladders, dumb-bells, Indian clubs, and wands.

The girls' athletic field provides facilities for such games as out-door basketball, field hockey, soccer, tennis, baseball, and cross-ball.

All women pay the fee of \$1.50 each semester for which they are given use of all equipment, lockers, baths; are furnished with towels, medical supplies for injuries, and are given first aid, massage, and physical examinations.

COURSES IN PHYSICAL EDUCATION FOR WOMEN

The following courses are offered:

A. Required Courses. In the regular courses in Practical Gymnastics a variety of work is taught. Both the Swedish and German systems of gymnastics are used, and the best in both is adapted to the needs of the classes. Much emphasis is laid on correct posture and breathing. During her first two years of college work each student, irrespective of classification, if not required to take corrective gymnastics, must be enrolled in courses 5, 6, 7 and 8, in which the practical work in Physical Education is divided as follows:

Two periods a week in practical gymnastics, plus two periods a week in elective courses. (These may be chosen according to needs or desire of students, from the list of elective courses described below.)

1. Elementary Secondary Gymnastics (and Electives).

Required of all vocational or special students who have not completed a full four-years high-school course. First semester; first year; four hours a week; 1 credit.

2. Elementary Secondary Gymnastics (and Electives).

Required of vocational students; second semester; first year; four hours a week; 1 credit.

3. Intermediate Secondary Gymnastics (and Electives).

Required of vocational and special students who have not completed four-years high-school entrance requirements; after they have completed courses 1 and 2. Four hours a week; 1 credit.

4. Intermediate Secondary Gymnastics (and Electives).

Required of vocational and special students who have not completed four-years high-school entrance requirements; after they have completed courses 1, 2, and 3. Four hours a week; 1 credit.

5. Practical Gymnastics (and Electives).

Required of all students; first semester; first year; four hours a week; 1 credit.

6. Practical Gymnastics (and Electives).

Required of all students; second semester; first year; four hours a week; 1 credit. Prerequisite: Course 5.

7. Practical Gymnastics (and Electives).

Required of all students; first semester; second year; four hours a week; 1 credit. Prerequisites: Courses 5 and 6.

8. Practical Gymnastics (and Electives).

Required of all students; second semester; second year; four hours a week; 1 credit. Prerequisites: Courses 5, 6, and 7.

26. Corrective Gymnastics. Special attention is given to those having spinal curvature, round shoulders, narrow chests, forward heads, weak backs, pronated ankles, and other physical defects or weaknesses.

Required of all students who have need of remedial work.

10. Hygiene.

Required of all freshmen. One lecture a week; $\frac{1}{2}$ credit.

B. Elective Courses.

I. Practice

Credit in these elective courses is given according to the number of periods taken each week, $\frac{1}{4}$ credit being given for each period.

27. **Outdoor Sports.** Soccer, playground ball, cross ball, base crick, track athletics, etc. Open to all students.

28. **Basketball.** Open to all students physically qualified.

29. **Soccer.** Open to all students.

30. **Baseball.** Open to all students.

31. **Indoor Baseball.** Open to all students.

32. **Hockey.** Open to all students.

33. **Advanced Gymnastics (and Electives).** Open to specials in Physical Education and, by permission, to such other students as are qualified.

Prerequisites: Courses 5, 6, 7, and 8.

34. **Tennis.** Open to all students.

35. **Swimming.** Open to all students.

36. **Fencing.** Open to all students who have satisfactorily completed courses 5 and 6.

37. **Indian Clubs.** Open to all students.

38. **Aesthetic Dancing. (Elementary.)** Open to all students. The purpose of this course is to develop grace and freedom of movement. Greek dancing, now considered one of the most important phases of gymnastic exercise, is emphasized.

39. **Aesthetic Dancing. (Intermediate.)** Open to all students who have completed course 38.

40. **Folk Dancing.** Open to all students. In this course are taught a variety of peasant and national dances suitable for recreation or teaching.

44. **Archery.** Open to all students.

II. Theory

41, 42. **Theory of Gymnastics.** (Open to students who contemplate teaching gymnastics.) Lectures, recitation, and practice teaching. (School hygiene is included in this course.)

Two periods a week; 41 first semester, 42 second semester; 2 credits each semester.

43. Play and Playground Games. Open to all Summer School students.

Five periods a week for summer session; 2 credits.

This course is designed for public-school teachers or students interested in playground work, or wishing to specialize in Physical Education. The psychology of play, adaptation of play to varying ages, necessity of supervision of play, simple equipment for school playgrounds, organization of games, will be given briefly. The greater part of the time, however, will be given to the practice of various playground games and simple folk dances.

45. History of Physical Education. This is planned for students specializing in Physical Education and is supplementary to the History of Education.

1 credit; 1 semester.

47, 48. Massage. Theory and practice.

Prerequisites: Anatomy and Physiology. One lecture; one laboratory period; 1 credit each semester; 47 first semester, 48 second semester.

49, 50. Physical Examination and Prescription of Exercises. Open to students specializing in Physical Education. (Personal and Sex Hygiene are included in this course.)

Prerequisites: Anatomy and Physiology. One lecture; one laboratory period; 1 credit each semester; 49 first semester, 50 second semester.

51, 52. Methods and Practice Teaching. Open to students specializing in Physical Education.

Lectures, recitations, and teaching.

Prerequisites: Courses 41 and 42. Two periods a week; 2 credits each semester; 53 first semester, 54 second semester.

53, 54. Organization and Administration of Playgrounds. Open to students desiring to teach Physical Education.

Two periods a week; 2 credits each semester; 53 first semester, 54 second semester.

56. Advanced Hygiene. A course for upper class girls who are majoring in Physical Education. This course is a thorough resume' of personal, school, pelvic, and social hygiene.

One recitation; reports on assigned readings; essays; 1 credit.

57. 58. Massage and Medical Gymnastics. Practical work in Corrective Clinic.

Prerequisites: Courses 47 and 48. Three periods a week; 1 credit each semester; 57 first semester, 58 second semester.

59. 60. Applied Anatomy and Kinesiology. A study of the science of muscles, joint mechanism, and the detailed effects of various kinds of exercise upon them.

Prerequisites: Anatomy and Physiology (Zoology 201, 202). One period a week; 1 credit each semester; 59 first semester, 60 second semester. Required of students majoring in Physical Education. Text: Bowen's Applied Anatomy and Kinesiology. Supplementary text: Skarstrom's Kinesiology.

61. 62. Special Methods in Physical Education and Orthopedics. Lectures, recitations, and advanced teaching.

Prerequisites: Courses 41, 42, 51, 52. Two periods a week; 2 credits each semester; 61 first semester, 62 second semester.

SPECIAL WORK IN PHYSICAL EDUCATION

An arrangement of courses will be made for women desiring to specialize in Physical Education, either with the purpose of teaching it in connection with their Home Economics or other courses in the schools of the State; or with the desire of securing a thorough foundation for continuation of this line of study.

There are two distinct kinds of courses necessary for the special study of Physical Education: I. Theory; II. Practice.

I. Theory

High-school preparation advised: Physiology, Physics, Chemistry, Latin, German.

College courses recommended: Zoology (101, 102), Physiology and Anatomy (201, 202), English (31, 32), Expression (206, 207), German (three years, or a knowledge sufficient to study scientific and medical works), Theory of Gymnastics (41, 42), Embryology and Histology (104, 105), Neuro Physiology (209), General Psychology (101), Educational Psychology (102), Dramatic Interpretation 208, 209), Story Telling (191, 192), American Literature

(71, 72), Home Nursing (511), Massage (47, 48), Physical Examination and Prescription (49, 50), Organization and Administration of Playgrounds (53, 54), Advanced Hygiene (56), Mothercraft, Basketry, Methods and Practice Teaching (Phys. Ed. 51, 52), Sociology (250), Education (131), History of Physical Education (45), Special Methods and Orthopedics (61, 62), Applied Anatomy and Kinesiology (59, 60).

II. Practice

Practical Gymnastics (5, 6, 7, 8), Advanced Gymnastics (33), Corrective Gymnastics (26), Aesthetic and Folk Dancing (Elementary and Advanced), Fencing (Elementary and Advanced), Swimming (Elementary and Advanced), Archery, Sports of all kinds.

PHYSICS

WILLIAM BALLANTYNE ANDERSON, Professor
GILBERT BRUCE BLAIR, Instructor
GEORGE S. MONK, Instructor

An endeavor is made to adapt each course to the needs of those taking it. The Engineering students use a text which seems to be the best available for their needs; while the text used by the Agricultural students was written especially for such students. The "Physics of the Household" was likewise written especially for students of Home Economics.

In all courses the practical side of the subject is emphasized both in lecture and in laboratory work. At the same time the theory of the subject, in so far as it deals with the fundamental principles of Physics, receives the attention that its importance demands.

Since Physics and Chemistry are the two basic sciences, it would seem that every College graduate should have had at least a general course in each of these subjects. The department, accordingly, urges that at least all College students who have not had Physics in high school elect some work in Physics after consultation with the head of the Department of Physics. Those expecting to teach Physics in the high schools should by all means take several courses in College Physics.

Equipment. The physical laboratory has a good working equipment for the study of general physics, the apparatus being such as to allow a qualitative or quantitative verification of the most important laws of physics by the student in the laboratory, and by the instructor in the lecture room. In addition to the general laboratory, the department has two special laboratories, one equipped for electrical measurements and the other for photometry. A partial list of the apparatus found in these follows: standard cells, shunts, capacities and inductances; secohmeter; Leeds and Northrup potentiometer; Siemens and Halske standard ammeters, voltmeter, and portable testing set; Paul unipivot testing set; storage cells of large current capacity for ammeter and wattmeter calibrations; 10½-inch spark coil; Gaede pump; large Tesla coil; Leeds and Northrup photometer fitted with lamp rotator, rotating sector, Lummer-Brodhum screen, and Bechstein flicker photometer.

In the General Library will be found many recent Physics texts and allied works, as well as several Physics Periodicals, which are available to all.

The following courses are offered:

1. General Physics. A course in general physics, descriptive rather than mathematical in character, covering the subjects of mechanics and heat.

Prerequisite: Geometry. The courses in Agriculture and Electrical Engineering; freshman year; the courses in Forestry and in Industrial Arts, sophomore year; elective in the course in Commerce, freshman year; first semester; repeated second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Anderson, Physics, Vol. I.

General Physics. A continuation of course 1 covering the subjects of sound, light, electricity, and magnetism.

Prerequisite: Physics 1. Required as listed under course 1; second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Anderson, Physics, Vol. II.

101. Engineering Physics. A course in mechanics and heat.

Prerequisite: Trigonometry. The course in Highway Engineering, Logging Engineering, Mechanical Engineering, and Mining Engineering; sophomore year; first semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period. Fee \$2.00. Text: Reed and Guthe, Physics.

102. Engineering Physics. A continuation of course 101, covering the subjects of electricity and magnetism, sound and radiation.

Prerequisite: Physics 101. Sophomore year; second semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period. Fee \$2.00. Text: Reed and Guthe, Physics.

105. Electrical Physics. An advanced course in general physics.

Prerequisites: Physics 1 and 2; trigonometry. The course in Electrical Engineering; sophomore year; first semester; 3 credits; 1 lecture; 2 recitations; 1 laboratory period. Fee \$2.00.

106. Electrical Measurements. A continuation of course 105, in which the study and use of electrical measurements is emphasized.

Prerequisite: Physics 105. The course in Electrical Engineering; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 1 three-hours laboratory period. Fee \$2.00.

133. Household Physics. A brief descriptive course with such applications as are of greatest interest to students in Home Economics extending over subjects of mechanics and heat.

The course in Home Economics; sophomore year; first semester; 2 credits; 1 lecture; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Lynde, Household Physics.

134. Household Physics. A continuation of course 133 and extending over subjects of electricity, light and sound.

The course in Home Economics; sophomore year; second semester; 2 credits; 1 lecture; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Lynde, Household Physics.

202. Electricity and Magnetism. An advanced course, taking up the theory of electrical measuring instruments, etc., with suitable practice in the laboratory.

Elective; credit to depend on work done. Fee \$2.00.

211. Heat and Light. An advanced course, taking up the phenomena of heat and light in detail, including recent discoveries.

Elective; credit to depend on work done. Fee \$2.00.

220. Descriptive Astronomy. A brief elementary course in astronomy designed to acquaint the student with the most important facts relating to the heavenly bodies. The object of the course is to make the student an intelligent observer of the more common astronomical phenomena. Descriptive rather than mathematical in character.

Elective; second semester; 2 credits; 2 recitations or equivalent in lectures and observation work, depending upon weather conditions.

222. Wireless Telegraphy. A study of electric waves, their measurement, and their application to practical wireless telegraphy.

Prerequisites: Math. 51, 52; E. E. 101. The course in Electrical Engineering; junior or senior year; elective; second semester; 3 credits. Fee \$2.00.

Signaling and Wireless. In connection with the military training, the department offers special work in signaling and wireless.

A. Elementary Physics. An elementary or high-school course in physics.

The vocational course in Mechanic Arts; third year; first semester; 3 credits; 3 recitations; 1 laboratory period. Fee \$2.00.

B. Elementary Physics. A continuation of course A.

Second semester; 3 credits; 3 recitations; 1 laboratory period. Fee \$2.00.

SUMMER SESSION

The chief purpose of the Summer School is to afford an opportunity for study to those unable to attend during the academic year. The courses are arranged for elementary and secondary teachers interested in Agriculture, Commercial branches, Home Economics, and Manual Training; for credit in regular college subjects, as well as for prospective students deficient in entrance credit; for those interested in music and art; and for those desiring practical instruction in agriculture, household economics, and woodwork.

During the session, a two-weeks course in Agriculture and Home Economics is given for boys and girls of the upper grammar grades and high school. Most of those attending are winners of local, county, or state prizes in the School Industrial Club contests. A limited number of boys and girls not prize winners is also admitted. A special bulletin gives particulars.

A large faculty, chiefly regular College instructors, supplemented by a number of specialists from other institutions and from other states, the extensive equipment in class rooms, laboratories, libraries, shops, and experimental fields, are at the service of the students.

RAILROAD RATES

To those attending the Summer School, the transportation companies grant a special rate of one and a third fare for the round trip, on the certificate plan. In order to receive the benefit of the reduction, the purchaser must pay full fare to Corvallis, **securing a receipt from the ticket agent** at the time of purchase. This receipt must be countersigned by the College secretary at Corvallis, and on presentation to the ticket agent at Corvallis will secure rate of one-third for the return. This special rate takes effect three or four days before the opening date of the Summer Session and remains in force until the same length of time after the closing date. Tickets on this plan may be secured at any time while the school is in session, and are also good for return at any time.

ADMISSION AND EXPENSES

There are no entrance examinations or other educational tests for admission. Students desiring college credit must meet entrance requirements and satisfy all other College standards. The registra-

tion fee of five dollars entitles the student to admission to as many courses as he cares to attend during the entire session. Private, individual lessons in music will be given at the regular price charged during the school year; students taking music only, will not pay the College registration fee.

The College dormitories, conveniently situated on the Campus, will accommodate about three hundred students with board and lodging. A charge of six dollars will be made to cover the cost of heat, light, use of laundry, etc. The rooms are provided with bed, mattress, table, and chairs. Each room has closet, hot and cold water, and electric light. Each student who desires to occupy one of these rooms must bring pillows, pillow-cases, sheets, blankets or comfort, bed-spread, towels, napkins, and soap. The laundry room will be open for the use of students at Waldo Hall without extra charge.

Table board will be furnished at Waldo Hall at the rate of five dollars a week. Lists of private lodging and boarding places will also be provided and every assistance rendered in finding satisfactory accommodations. Furnished rooms for light housekeeping may also be had.

Allowing \$36.00 for board and room, \$5.00 registration fee, and \$1.00 for drayage on baggage, \$18.00 for laundry and incidentals, the minimum cost for the entire six weeks need not exceed \$60.00, exclusive of railroad fare. Those who take courses requiring textbooks and laboratory fees must make some additional allowance.

SOCIAL AND OTHER FEATURES

The informal and recreation diversions from the class and study routine have not only a social but an educational value as well. These are so controlled and directed as to be inexpensive and unobtrusive. Opportunity for students to become acquainted with each other and with the instructors outside the class room is afforded during the informal receptions and parties each week.

The College numbers among its faculty some of the best-known popular lecturers in the State. Several will be heard in illustrated stereopticon addresses on interesting phases of Oregon's industrial development. At least once each week an evening will be given up to entertainment, either in the form of a lecture of general interest, or a musical concert.

The tennis courts, baseball field, gymnasium, and other recreational resources of the Institution may be used by the students and

instructors, free of charge. Boating on the Willamette and Mary's rivers, picnics and excursions to various points of interest, including Mary's Peak, and week-end trips to the ocean at Newport, will also be available for those who desire to indulge in these recreations. The social features of the Summer School are given careful attention, so they may not come in conflict with the regular work, but at the same time be full of pleasure and interest.

SPECIAL ILLUSTRATED BULLETIN

Each spring, special circulars are issued, giving complete description of the various courses offered, statement in detail of living and other expenses, list of instructors, directions for registrations, and other matters. These bulletins are illustrated with interesting views of the College Campus. Copies may be obtained by addressing the Oregon Agricultural College, Corvallis, Oregon.

WINTER SHORT COURSES

For many years the Oregon Agricultural College has offered each winter one or more courses of lectures and demonstrations which have been known as Winter Short Courses. These courses have been so generally successful and have called forth so many expressions of approval from those in attendance, that the work has expanded until several courses are given in each of the following schools:

School of Agriculture.

School of Commerce.

School of Engineering.

School of Forestry.

School of Home Economics.

Each of these courses, except the one in Industrial Arts, which will consist entirely of practical work in the shops or in the draughting room, will consist of a series of lectures supplemented by demonstrations, and by practical exercises in the dairy, the orchard, and the various laboratories. The work is so arranged that each hour of the day, from 8 until 5, may be filled with lectures and laboratory or field demonstrations. The work offered will be adapted to the various needs of farmers, fruit growers, dairy-men, mechanics, or of women in the home.

The various courses are so planned as to provide the largest amount of practical information in the short time available. The subjects to be discussed are those in which every farmer should be interested, and the aim will be to present them in the most practical manner possible. The laboratory and collections, the shops, the creamery, the orchards, the College farm, the cutting, fitting, and sewing rooms, the dining rooms and kitchens—all offer facilities for demonstration or for practical exercises by the students attending these courses. A pleasing and profitable feature of these courses will be a series of lectures by prominent men who are qualified by successful experience to speak upon some particular phase of Agriculture.

Special lessons in Music may be taken by short course students at the regular rates listed under the School of Music.

Students should report to the Registrar for registration and for assignment to the various classes. The inclusive dates of these short courses are as follows: Winter Short Courses, November 4 to December 21; Forestry Short Course, November 4 to April 11,

Special short courses on particular subjects may be announced from time to time. A list of boarding and lodging places may be consulted at the office of the Y. M. C. A.

No entrance examination or other educational test will be required; but no one will be received who is less than sixteen years of age.

There will be no fees whatever for attending the exercises of Farmers' Week. Those who attend the other courses will be expected to pay a registration fee of \$1.00. In addition, students who elect certain courses will be expected to pay small fees, to cover the cost of materials used.

Board and lodging may be had in Corvallis at \$4.50 to \$6.00 a week.

Railroad Rates. The railroad companies grant a rate of one and one-third fare for the round trip on the usual certificate plan.

A circular descriptive of all Short Course work will be issued about November 1, and may be obtained by addressing the Oregon Agricultural College, Corvallis, Oregon.

AGRICULTURE

The School of Agriculture is making two important changes in their short course. It has been decided to increase the short course from four weeks to six weeks and to hold it earlier in the year. The course will be given November 4 and extend to December 21.

The course is one in general agriculture and includes special lectures and laboratory work in such courses as Dairying, Farm Crops, Stock Feeding and Management, Stock Judging, Poultry, Soils, Horticulture, Farm Mechanics, Drainage, and Farm Management.

COMERCE

Commercial Lecture Course. To meet the demand for a short, practical business course, the work outlined below will be offered in a series of lectures under the same conditions and entrance requirements as other winter courses.

Bookkeeping. This course will embrace the fundamental principles of double entry bookkeeping. It will be made strictly practical and only sufficient theory will be introduced to give the student a firm foundation for his work. The basis of the work will be a study of a model general store equipped with the latest labor-saving

methods of bookkeeping and office practice. Eight lectures and demonstrations.

Business Law. The course in Business Law will begin with the thought that there are certain fundamental principles of commercial law with which everyone should be familiar, and will include the following important subjects: property, contracts, negotiable instruments, interest and usury, bailment, agency and partnership, and real estate. Eight lectures.

Business Forms Letter Writing. The purpose of this course will be to familiarize the student with various forms used in general business practice. Exercises will be required illustrating both principle and practice in a clear, simple understandable manner. In the work of letter writing the correct form, wording, and general arrangement of the business letter will be taken up. Original letters, received from the most important manufacturing concerns and business houses of the United States, will be studied. Eight lectures.

Penmanship. The work in penmanship will embrace the study and practice of the best forms and style of practical business writing. The primary aim of the course will be to develop an easy, rapid, legible business hand. Eight lectures a week.

Typewriting and Office Methods. The work in typewriting will be outlined to suit the requirements of the individual student. The beginner will be taught the correct method of fingering, the uses of the various parts of the machine, the care of the machine, manifold, and the correct arrangement of the typewritten letter or form.

Farm Accounting. A complete analysis of farm accounts by different methods, in which simplicity, accuracy, and labor-saving are emphasized; household and personal accounts; cost accounting and special records; cost of production; special cost records; labor records; milk records; poultry records; etc.; the farm plot; office methods; business organizations; business correspondence and business forms. Eight lectures and demonstrations.

Rural Law. The general principle of common and statutory law are discussed and explained; special phases of law affecting the farm, such as titles to real estate, deeds, mortgages, county records, etc.; landlord and tenant; eminent domain, and right-of-way; water rights and boundaries; laws governing shipping, insurance, banking, etc.; court procedure. Eight lectures.

Rural Economics. The fundamental principles of production, distribution, and exchange with special reference to rural life. Rural labor problems, farm finance, legislative problems affecting rural life, cooperative organizations, marketing products, advertising, the economics of machinery, transportation, etc. Eight lectures.

HOME ECONOMICS

These courses are designed for all women who are interested in the practical and scientific working out of household problems, and who are unable to avail themselves of a regular course in Home Economics. Many agricultural men and their sons yearly take advantage of the Short Courses which deal with the problems of the farm, such as feeding of cattle, judging of corn, study of soils, etc. It is to meet the demand of Oregon women who are interested in the correct feeding of the family, the judging and selection of materials used in the home, the making of suitable and attractive clothing, and a study of sanitary conditions which lead to the health, comfort, and happiness of the family, that this course has been established, and is to be carried on.

The courses outlined below are essentially those that are usually sought by patrons of the Short Course. Some variation, to meet the special needs of each session or to conform to the teaching program of the School of Home Economics, will doubtless be advisable. Consult the special circular and program of courses issued each year for the Winter Short Course.

Food Preparation. This course deals with the subject of foods and food preparation in its scientific and economic aspect. It is the study of the nutritive principles as they are found in various foods, and the method of cooking foods to retain those principles in a form most completely and easily digested; serving of food in simple and attractive form; economy of money, time, and labor being the watchword.

Special Food Preparation. This course consists of the selection and preparation of foods for children of different ages, adults in active life, the aged, and invalids.

Household Management.

General health and welfare of the home.

- (a) Economy of time, labor, and income.
- (b) Sanitation of the home.
- (c) Home nursing.

Note.—These courses have been planned to meet the needs of those who have had previous work, as well as those who are entering for the first time.

Plain Sewing. This course is planned for those women wishing instruction in the economical purchasing and making of household linens and underwear; the mending and renovating of old garments usually found in all households; the draughting of patterns for underwear to the student's own measurements, together with the practice of interpreting and using purchased patterns.

All women are eligible to this course.

Dressmaking. This course offers instruction in the principles of dressmaking; the taking of accurate measurements; the draughting and use of patterns; the choosing and economical cutting of materials; the making of at least one dress, with special emphasis on artistic color combinations and suitable design.

Tests will be made showing the adulterations of textiles; and simple methods of detecting the adulterations in dress materials will be given.

This course is given for the women who have had experience in sewing and dressmaking.

Advanced Dressmaking. Students who have previously taken one winter's short course will be given instruction in advanced dressmaking, if they so desire.

Millinery. This work will be given by lectures and demonstrations only. No practice work will be given to the students.

Basketry. This course will be given three times each week.

Care of Children. Three lectures each week will be given on the care of children. Only mature women will be admitted to this class.

Camp Cookery. The course in Camp Cookery consists of two laboratory lessons each week. It is especially designed for men, but women are admitted if the class is not already full. Only twenty students can enter these classes.

ENGINEERING AND INDUSTRIAL ARTS

It is the purpose to teach the subjects offered in a straightforward, practical manner, which can be readily grasped and understood by farmers, mechanics, and others who have had only the advantage of a common school education.

Woodworking. Considerable latitude will be allowed in choosing the particular line of work desired in this department as set forth under the following headings:

(a) A course for those not familiar with the care and handling of tools. This course affords instruction in the correct methods of using, sharpening, and caring for the tools of the carpenter's bench. The work is exemplified by exercises in planing, sawing, chiseling, and the construction of useful articles of furniture.

(b) The Steel Square and Its Use. This work includes laying out rafters, braces, stairs, and other work with the steel square. Lectures will be given on the use of the square, after which the actual construction of work will be undertaken by the student.

(c) Instruction in the use of paints, stains, and varnishes.

Blacksmithing. Two lines of work are offered in blacksmithing:

(a) Students with no previous knowledge of blacksmithing are taught how to build and manage a forge fire; how to draw, bend, upset, forget, and weld iron; how to make chains, clevises, hooks, gate-hinges, whiffletrees, and neck yoke irons, and other useful articles.

(b) A course in working and welding steel for those with some general knowledge of blacksmithing. This course includes a study of the different grades of steel; the effect of heat treatment on the quality and temper of steel; the use of the color scale in tempering; and finally the forging, dressing, and tempering of steel tools.

Road Building and Maintenance. A course of lectures on practical road construction and maintenance. This course will consist of three or more lectures each week during the short course on the fundamental principles of road construction and maintenance, and will include lectures on the following subjects: Alignment; grade; drainage; the road census and the interpretation of its results; selection of type of roads; maintenance of different types of roads; the road drag; road machinery; culverts and small bridges, etc.

Special laboratory work will be arranged for those desiring to study the physical properties of road building materials.

Concrete. A course of lectures will be given on the theory of concrete and on its practical application to farm and highway structures, walks, etc. In this course proper proportioning for different classes of work, proper aggregate, causes of failure, costs, and methods will be discussed.

SCHOOL OF MUSIC

The School of Music is a self-supporting department of the Oregon State Agricultural College, organized in 1908 under the present management by authorization of the Board of Regents, in response to insistent demand therefor from the student body.

The School of Music serves the State as efficiently as possible at no greater expense to students than is necessary, rates of tuition being no greater than in other similar standard colleges and universities.

The studious atmosphere, wholesome discipline, adequate modern musical equipment, and attractive environment of Oregon State Agricultural College are favorable alike to those just beginning music study and to advanced students, all of whom may enter at any time and advance to graduation as rapidly as consistent with creditable scholarship.

The time required for completion of the various courses offered is somewhat dependent upon the age, temperament, talent, ability, and character of work of each student.

The members of the faculty are accomplished performers. As instructors they are skilled in the psychology, and experienced in the practice of teaching. In undertaking these courses students may confidently anticipate maximum gain in musical efficiency at minimum expenditure of time and money.

FACULTY

DEPARTMENT OF VOICE

WILLIAM FREDERIC GASKINS, Mus. Bach.

Director of the School of Music.

Professor of Music.

Professor of Voice Culture, Singing, Conducting, Music History.

Graduate student Hillsdale College Conservatory; Graduate student American Conservatory; Graduate student of

Karlton Hackett, Chicago; J. D. Mehan, New York, F. X. Arens, New York.

GENEVIEVE BAUM-GASKINS

Instructor in Voice Culture and Singing.

Graduate American Conservatory, Chicago; Student of William Nelson Buritt, New York; Karlton Hackett, Chicago; William Frederic Gaskins, Chicago; John Dennis Mehan, New York.

OREGON AGRICULTURAL COLLEGE

DEPARTMENT OF PIANO

GENEVIEVE BAUM-GASKINS

Instructor.

Student of John J. Hattseaedt, Chicago; Graduate American
Conservatory, Chicago.

MAY BABBITT-RESSLER

Instructor.

Student of Arthur Foote, Boston; Leschetizky method studied with
Jeanne Marie Mattoon, New York.

GUSTAV DUNKELBERGER, Mus. Bach.

Instructor.

Graduate of Bethel College Conservatory; Graduate student of
American Conservatory, Chicago; student of Heniot Levy,
Arthur Oluf Anderson, Adolph Weidig, Chicago.

DEPARTMENT OF ORGAN

GENEVIEVE BAUM-GASKINS

Instructor.

Student of Wilhelm Middleschulte, Chicago.

DEPARTMENT OF STRING INSTRUMENTS

CARL GRISEN

Student of Edmund Singer, Stuttgart; Gustav Hollaender, Berlin;
Carl Halir, Berlin; Samuel de Lange, Berlin;
Joseph Mayer, Berlin.

DEPARTMENT OF THEORY

WILLIAM FREDERIC GASKINS, Mus. Bach.

Theory of Music. History of Music.

GUSTAV DUNKELBERGER, CORINNE BLOUNT

Harmony, Counterpoint, Harmonic Analysis, Composition

CARL GRISEN

Orchestration.

DEPARTMENT OF BAND INSTRUMENTS

HARRY LYNDEN BEARD

Student of Herbert L. Clarke of Sousa's Band.

Instructor in Theory and Art of Playing Band Instruments.
Band Conducting.

COURSES IN MUSIC

In these courses the following subjects are included: elements of music, history of music, interpretation, languages, music form and analysis, music pedagogics, song singing, oratorio singing, opera singing, choral singing, organ playing, organ structure, piano playing, piano structure, sight reading, stage deportment, stringed instrument playing, wind instrument playing, brass instrument playing, theory, harmony, counterpoint, composition, voice culture.

The following courses are offered:

1. **Voice.** Exercises will be given for correct breath control; purity of tone production; freedom of action and blending of registers; articulation and correct pronunciation and enunciation of vowels and consonants; elements of phrasing and style. Students must appear on programs if requested, singing from memory, and attend all rehearsals and recitals unless otherwise instructed by the Director.

Required: Two lessons a week in voice, practice with instrument one hour daily; harmony, course 10; and history of music, two hours a week each; choir and chorus practice. Physical education.

2. **Voice.** This course consists of exercises for tone placing; phrasing and style; legato, marcato, and portamento delivery. Physiology of the vocal mechanism. First year Italian, or French, at student's option unless otherwise advised by the Director. Songs and exercises of medium grade of difficulty. Attendance and performance at recitals and rehearsals required, unless otherwise instructed by the Director.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; harmony, course 11, Italian, or French; physical education.

Prerequisite: Course 1 or its equivalent.

3. **Voice.** This course includes the study of tone color, agility, the trill, *messa di voce*, recitation, declamation, phrasing, style; songs in English, French, Italian; the regular second year study of one of the above foreign languages at the student's option, in the department of Modern Languages, unless otherwise advised by the Director. Attendance and performance at recitals and rehearsals required unless otherwise directed as above, singing from memory on programs of the School of Music when so required.

Required: Two lessons a week in voice; two lessons a week in harmony; course 14, French, or Italian, at student's option, second year study as required in department of Modern Languages; choir and chorus practice; physical education.

Prerequisite: Course 2 or its equivalent.

4. **Voice.** This course includes advanced study of vocal technique by means of difficult exercises, songs, oratorios, operatic arias, declamation. Advanced composition throughout the year; courses 16 and 17. Attendance at rehearsals required in preparation for public appearances, and at recitals, singing from memory. For graduation a public recital must be given as arranged by the Director, unless he may specify to the contrary. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 3 or its equivalent.

5. **Piano Preparatory Course.** For beginners. Training of the hand, fingers, wrist, and arm. Extended preparation for scales and arpeggios. Easy studies by Bertini, Duvernoy, Loeschhorn, and others. Selections from easier works of Clementi, Haydn, Beethoven, and other easy appropriate compositions.

Required: Two lessons a week in piano; practice with instrument, one to three hours daily.

6. **Piano.** Scales and arpeggios. Exercises for endurance, speed, accent, and rhythm. Etudes from Czerny, Cramer, Moszkowski, and others. Easy sonatas of Haydn, Mozart, and Beethoven. Easy compositions of Mendelssohn, Schubert, Schumann, Grieg, and others.

Required: Two lessons a week in piano; harmony, course 10; two lessons a week in music history for thirty-six weeks; practice with instrument, two to four hours daily. Physical education.

Prerequisite: Course 5 or its equivalent.

7. **Piano.** Scales in various forms and technical exercises adapted to the particular needs of the student. Etudes of Czerny, Cramer, Ruthardt, and others. Suites and inventions by Bach. Mozart, Beethoven, and Weber sonatas of moderate difficulty. More difficult selections from Mendelssohn, Schumann, Chopin, Liszt, and others. Transposition of easy hymns, sight reading, and memory training.

Required: Two lessons a week in piano; in harmony, course 11; practice with instrument, three to five hours daily. German or French as advised by the Director. Physical education.

Prerequisite: Course 6 or its equivalent.

To complete this course satisfactorily the student must fulfill the requirements above outlined and perform in public when requested by the instructor and approved by the Director.

8. Piano. Exercises based on the technical difficulties in compositions studied in this course. A limited number of etudes by Rubinstein, Henselt, Haberbier, and others. Well-tempered clavier. The more difficult sonatas of Beethoven and solos by Mendelssohn, Chopin, Schumann, Grieg, Liszt, Brahms, and others. Concertos by Mozart, Mendelssohn, Beethoven, and Moscheles.

Required: Two lessons a week in piano; harmony, course 12; two lessons a week in counterpoint, course 14. German or French. Physical education.

Prerequisite: Course 7 or its equivalent.

To complete this course satisfactorily the student must fulfill the requirements above outlined and perform in public when requested by the instructor and approved by the Director.

9. Piano. Comprehensive study of the principal classic and romantic composers. Etudes by Chopin and Moszkowski. Solo works of modern composers. Concertos by Schumann, Chopin, Rubinstein, and others.

Required: two lessons a week in piano; harmonic analysis, course 16; composition, course 17, and orchestration, course 18; practice with instrument, three to five hours daily. Public performances under conditions approved by the Director.

Prerequisite: Course 8 or its equivalent.

For graduation, students are required to perform publicly under the direction of the School of Music, playing a program not less than one hour in length, arranged by the instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Theory. The courses in theory will comprise systematic and progressive study in the science of music. Consideration will be given to the theories of acoustics, to notation, scales, keys, modes, sight reading, intervals, melodic progression, tempo, dynamics, rhythm, and ear training. Advanced theory will embrace harmony, counterpoint and subdivisions thereof, music history, concluding with form, composition, and orchestration. For graduation, thirty-six weeks study of theory is required, or the equivalent thereof, outlined as follows in courses 10 to 18, inclusive.

10. Harmony. Consideration will be given to the theories of acoustics, the formation of the diatonic scale, to intervals, chord

construction, the relative importance of triads within one key, connection of primary triads, rhythm, the elements of melodic construction, and part writing. Harmonization of melodies and unfigured basses. Original periods.

11. Harmony. Key relations. Chords of the seventh. Direct and extraneous modulation. Altered and mixed chords.

Prerequisite: Course 10.

12. Harmony. Inharmonic tones. Accompaniment. Original work. Study of the various modern harmonic theories.

Prerequisite: Course 11.

13. Ear-training. Aural recognition of intervals demonstrated orally and in writing. Singing of diatonic and chromatic intervals from given tones. Writing at dictation of moderately difficult melodies and harmonic progressions.

14. Counterpoint. Simple counterpoint in five species employing from two to eight parts. Original exercises. Contropuntal chorale elaborations.

Prerequisite. Course 11 or its equivalent.

15. Counterpoint. Double, triple, and quadruple counterpoint. The canon, invention, and the various species of fugue, single and double.

Prerequisites: Courses 12, 13, and 14.

16. Harmonic Analysis. Detailed analysis of representative works of the masters and other compositions. Harmonic memorizing of moderately difficult selections.

Prerequisites: Courses 12 and 13.

17. Composition. The application of harmonic material in original exercises in the various forms of composition, including the primary forms, the song, theme with variations, etude, rondo forms, sonatina and sonata.

Prerequisites: Courses 12, 13, and 14.

18. Orchestration. The arrangement of music for orchestra. The theoretical study of orchestral instruments and their functions.

19. Violin. This course is preparatory, and designed to develop correct fingering, free bowing, and accuracy as to pitch, rhythm and intonation.

Studies. Sevcik School, Greenberg, major scales, minor scales in the first position; studies by Hohman, Kayser, and others, elementary solos; special sight reading duos by Mazas and Dancla.

Other appropriate studies may be substituted for the above, if approved by the Director, as acceptable equivalents, the same to be satisfactorily performed before entering course 20.

Students must appear in public recitals when required by the Director, playing from memory.

Required: Two lessons a week, harmony, music history, as in courses 10 and 11.

20. Studies by Kayser, Wohlfahrt, Schradieck, Mazas, Dont, and Kreutzer. Scales by Musin, Schradieck, or acceptable equivalents. Suitable solos, concertos, sonatas, etc. Students must appear in performances at public recitals when required by the Director, playing from memory.

Required: Two lessons a week, harmony, courses 11 and 12, and Counterpoint, course 14.

Prerequisite: Course 19.

21. This course consists of advanced studies by Dancla, Fiorillo, Singer, Rode, Gavinies, Paganini; solos by Dvorak, Brahms, Vieuxtemps, Rovelli, Spohr, De Beriot, Viotti, Wieniawski, or other acceptable equivalents. Students must appear in public recitals when requested, playing from memory.

Required: Two lessons a week, harmonic analysis, composition, French or Italian as in course 8. As a qualification for graduation students are required to perform publicly, under the direction of the School of Music, a program not less than an hour in length, arranged by the Instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 20.

The Orchestra. Students of string instruments in attendance at the College, who are sufficiently advanced, may be admitted to membership in the College Orchestra by arrangement with the Conductor on such terms as may be approved by the Director. It is the intention of the management to encourage in every reasonable manner the development and maintenance of a good orchestra under competent progressive leadership. Students are invited to investigate these opportunities for excellent training in orchestra routine and solo playing. Such experience and drill are of great educational and cultural value.

The Orchestra library consists of works by the following composers: Dvorak, Brahms, Tschaiowsky, Grieg, Gounod, Verdi, Mendelssohn, Beethoven, Elgar, Wagner, Offenbach, Strauss, and others.

Ensemble: Sonatas for violin and piano; string trios; quartettes for two violins, viola, and 'cello; and for four violins, are available for study. All students in the above classes, or registered in any of the above courses, must perform from memory in public when requested by the Director. Membership in the ensemble classes is free, and instruction is to be given by the principal violin instructor.

BAND INSTRUMENTS

Instruction will be given by the regular College band leader in the use of brass, wood-wind, and percussion instruments.

To become a member of the College Band, a student must pass a satisfactory examination in the elements of music and ability to perform on his instrument.

Members are required to attend rehearsals each school day, and a reasonable amount of individual practice is expected.

There is no charge for instruction in the band. Each member must furnish his own instrument and music stand, except basses, baritones, altos, and drums, which are furnished by the College.

Any student desiring to enter the band should see that his instrument is in low pitch.

The courses for the various band instruments are as follows:

22. **Cornet.** Methods by Arban; characteristic studies by St. Jacome.

23. **Clarinet.** Methods by Dieppo; studies by Dieppo and Blume.

24. **French Horn.** Methods by Franz; studies by Franz and Hayffman.

25. In all other band instruments, including the oboe, bassoon, saxophone, alto, and bass clarinets, drummer's trapps, xylophone, and orchestra bells, the courses will be similar to those given above.

The work in theory required to complete these courses is that outlined in courses 6 and 7.

GENERAL INFORMATION

Any student in the Oregon Agricultural College with a satisfactory record in scholarship in his major course may take at least one hour a day in music, by arrangement with the Director.

The authority to register and assign all applicants for music instruction is vested solely in the Director, who must first be consulted for the arrangement of details of registration, or at any time when information is required that pertains to study in the various departments of the School of Music.

Students in the School of Music may enter classes in the several departments of the College; and in order to enhance their general culture are encouraged to take at least one study throughout the school year other than the work required in the regular music courses.

Applicants for instruction may take complete or part courses. Those registering for the former are classified as "regular music," while the others are classified as "special music."

"Special Music" students have the option of selecting such music studies as they desire by registering for the same with the Director in the regular manner and at the catalogue rate of tuition.

Non-resident young women are required to live in the dormitories, where their conduct is subject to the approval of the Preceptress. Outside rooming and boarding places may be obtained, subject to the approval of the College authorities. The rates for board and room are listed elsewhere in detail.

Students registered for study in the regular courses of the Oregon Agricultural College School of Music are subject to the same rules and regulations as all regular students in other courses.

No student is permitted to omit lessons or practice without sufficient excuse, and no refund will be made for absence from lessons or practice or for discontinuance, except in cases of severe personal illness; for such unavoidable absence, lessons may be made up only by appointment, and before the expiration of the term.

Lessons falling on legal holidays, or on special holidays petitioned for by the student body or by special student organizations, which may be granted by the College authorities, will not be made up.

Students will not be permitted to transfer tuition accounts to others, nor to receive credit for tuition fees beyond the assigned

registration period, except in cases of severe personal illness, or similar extreme necessity, attested by the College Physician, and then only by making suitable arrangements with the Director.

The College year in the School of Music consists of thirty-six weeks, divided into terms of about twelve weeks each, the first term beginning at the opening of the College on September 23, 1918.

Tuition. Private individual instruction is given in lessons of thirty minutes each, in all departments of the School of Music. Class instruction in theoretical branches is required of candidates for graduation, as specified in the preceding outlines of courses. Terms for instruction are as follows:

Voice Culture and Singing — Professor Gaskins, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Organ — Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....	\$24.00
Two lessons a week, a term.....	48.00

Piano — Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Piano — May Babbit-Ressler, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Piano — Instructor Dunkelberger, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Violin, Viola — Instructor Grissen, private instruction:

One half-hour lesson a week, a term.....	\$15.00
Two half-hour lessons a week, a term.....	30.00

Mandolin, Banjo, Guitar — Instructor Brewster, private instruction:

One half-hour lesson a week, a term.....	\$12.00
Two half-hour lessons a week, a term.....	24.00

Band Instruments — Instructor Beard, private instruction:

One lesson a week, a term.....	\$10.00
Two lessons a week, a term.....	20.00

Music History — Professor Gaskins, class instruction:

Two hours a week, one term.....	\$ 3.00
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Theory—Courses 10 to 18 inclusive, Instructors Dunkelberger,

each course, a term.....	\$ 7.50
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PRACTICE

Rooms located in the Administration building have been suitably furnished for the use of students wishing to practice in private. These rooms may be rented for about one-third the cost of using pianos located in private houses, and without any of the disadvantages in connection therewith. They have steam heat, good ventilation, electric light for night practice, good janitor service, and are furnished with good pianos, kept in tune by the College. Students living in the College dormitories are required to practice upon these pianos. Students living away from the campus may arrange with the Director for practice on the same terms and conditions, as follows:

Piano—

Term of twelve weeks, one hour a day.....	\$ 5.00
Two hours	7.50
Three hours	10.00
Four hours	12.50
Five hours	15.00

Organ—

Term of twelve weeks, one hour a day.....	\$12.00
Two hours	18.00

The pipe organ is a new, modern Kimball two manual, concave pedal board instrument of beautiful tone.

For additional information address William Frederic Gaskins, Director of the School of Music, Room 30, Administration Building, Oregon Agricultural College, Corvallis, Oregon.

THE EXPERIMENT STATION

ARTHUR BURTON CORDLEY, Director
CLAUDE ISAAC LEWIS, Vice Director

The Agricultural Experiment Station bears an important relation to the College, as the scientific investigations conducted by the staff strongly support the instruction given in the class room and through the Extension Service. Aside from the original investigations of economic significance to agriculture, the work of the Station affords daily object lessons in modern farm methods.

About 650 acres of land are available for the use of the College and Station workers. This land is utilized by the various departments represented in Station organization, including the departments of Chemistry, Farm Crops, Farm Management, Farm Mechanics, Horticulture, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Entomology, Bacteriology, Pharmacy, and Botany and Plant Pathology. Each department is actively engaged in the scientific investigation of problems presented by the different branches of agriculture.

In addition to the experimental work carried on by the departments of the School of Agriculture, experimental work is also conducted by the School of Engineering, the School of Home Economics, and the School of Pharmacy.

The value of such work, as an object lesson to the students in the various fields of study, can hardly be overestimated. Its value to the State, from the point of view of economic progress, has been greater, in the estimation of many careful observers, than the entire cost of the College to the people.

As an illustration of the comprehensive character of the investigational work carried on by the Station, the following brief summaries of projects, by departments, is presented:

Agricultural Chemistry. This department, either independently or in cooperation with other departments of the College, has under way a considerable number of experiments that are of wide significance both to the economic interests of the State and Nation and to the cause of science. Experiments with arsenical sprays, that represent a total annual expenditure throughout the country of six to eight million dollars, are directed to the object, first, of determining exactly how the efficiency of these arsenicals is best conserved, and second, how a less expensive form of a similar insecticide may

be developed. The first object has been partly accomplished, with promise of conclusive results, and the second, through the use of arsenate calcium, seems also within reach of fulfillment. A study of the acid or sour soils of the State of Oregon is being made to ascertain, if possible, by means of pot experiments and laboratory tests, the causes of acidity and to what degree applications of various forms of lime will correct this abnormal condition. It has been found that some acid soils respond to lime treatment while others do not. A physical and chemical examination of these types of soil is being made as to treatment with different calcium salts in order that information regarding this inconsistency may be obtained. In cooperation with the Southern Oregon Branch Experiment Station, at Talent, the department has made a complete chemical survey of the soils of the Rogue River Valley, with a view to determining the deficiencies to be supplied by fertilizers. Sulfur is found to be the element, which, when added to certain of these soils, increases the production of alfalfa and other legumes by percentages running into the hundreds. These fertilizer experiments promise some very striking and valuable results. Incubation experiments, now reaching completion after several years of laborious and painstaking study, go to show that varying the conditions of incubation varies also the quality of the chicks produced. Limited experiments with Loganberry juice have been conducted to determine what jelly-making acids are present in the juice, what modifications appear in the juice of the second pressing, and what use may be made of the pulp. Soil analyses conducted in connection with the reclamation service have comprehended one-half million acres of land. Routine analyses of commercial fertilizers, especially of limestone, have shown the need of caution in the use of these fertilizers at current prices unless the quality is high. Analyses of all insecticides on the market are on file at the Chemist's office, where information concerning any of them may be had, free of charge, on application.

Animal Husbandry. Experiments in Animal Husbandry, which comprehend tests with horses, beef cattle, sheep, and swine, are conducted partly at the Corvallis Station and partly at the Eastern Oregon Branch Stations. Experiments with horses are directed to determine the cost of horsepower for various types of farm and other work; the amount of work that may reasonably be expected from a horse; the cost of keep; etc. Experiments with beef cattle,

conducted chiefly at Union, are concerned with fattening steers on various rations and with methods of maturing range cattle. Experiments with sheep have been directed to determine the cost of production, the carrying capacity of different types of pasture, methods of fattening sheep, maturing ewes, and methods of rearing and marketing lambs for meat purposes. Experiments with hogs involve the cost of production, including rapidity of gain; and comparison of different feeding rations and methods of feeding, including use of pasture.

Bacteriology. Experimental work in Bacteriology is chiefly concerned with soil analyses, with dairy manufacturing, sanitation, and diseases of poultry. Three experimental projects of economic importance that are now under way are the following: (1) The effect of lime and landplaster on the growth of soil bacteria and therefore on the crop; (2) The effect of dryness and varying degrees of soil acidity on the growth of legume bacteria; (3) The facts concerning the prevalence, transmission, and means of control of chicken diseases such as tuberculosis and white diarrhoea.

Botany and Plant Pathology. The work in this department includes the following investigations: Methods of control for grain smuts and their effect on the vitality of the seed; storage decays of potatoes and other vegetables and their prevention; wilt diseases of potatoes and other crops; the control of onion smut and onion mildew; relative efficiency of various fungicides both liquid and dust; control of peach diseases; walnut-blight control; brown-rot prevention; bean diseases; Oregon crop-disease survey; poisonous-plant investigations; weed studies; etc. Special emphasis is now being laid on work of particular importance in connection with the Government's increased food production campaign.

Dairy Husbandry. Experiments in this department are directed to standardizing the color of butter and to determining the amount of coloring matter to be added to cream of a certain test, by sample, in order to bring it to standard color, or "June shade;" to determine the keeping quality as affected by different methods of cream neutralization and pasteurization; to determine the cost of manufacture of different dairy products under commercial conditions; to determine, by testing the different factors in the handling of milk, what are the essentials in reducing the bacterial count of milk for market; to determine the function of the so-called milk veins and their bearing on milk production; to determine the

factors influencing the percentage of fat content in milk; to determine the feeding value of alfalfa meal as a substitute for the usual grain feeds; to determine the value of kale as compared with silage as a succulent feed.

Entomology. Experiments in Entomology include tests to determine the toxicity of various insecticides with three objects in view: (1) To discover new and cheaper insecticides; (2) To discover possible combinations of sprays that will reduce the number of necessary applications; (3) To determine the actual amount of poison necessary to kill a given insect. Experiments also include tests to determine possible means of control for root borers and other root-infesting insect that carry plant diseases; and ecological and life-history studies on orchard plant lice.

Farm Crops. This department has in hand eleven specific experimental projects of chief importance; namely, (1) Variety tests of wheat, oats, barley, flax, vetch, potatoes, and corn; (2) Cultural tests on miscellaneous crops such as sudan grass, sunflowers, mustard, soy beans, and cow peas; (3) Seeding experiments on the time, rate, and date of seeding cereals and legumes; (4) Selection and breeding work with cereals and legumes; (5) Grain and seed storage and handling investigations; (6) Hay handling and storage investigations; (7) Silage making; (8) Grain milling value and milling tests; (9) Crop rotations; (10) Cost of producing crops; (11) Effect of fertilizer on quality of crop.

Farm Management. By means of the farm survey and through farm-record keeping and study of individual cases, a number of the important phases of farm management are being investigated. These are as follows: (a) The determination of the chief factors in successful farming in six different counties of the State, through farm surveys and records; (b) Determination of the cost of production of different crop and live-stock products and the cost of various farm operations, in sixteen counties, through record keeping; (c) Methods, efficiency, and costs in manure handling and preservation, through a survey; (d) Farm organization and management planning on individual farms; (e) Methods and costs of land clearing under different conditions.

Some special study is being given to labor supply and labor efficiency on the farm at this time.

Horticulture. Experiments in Horticulture comprise the following types of investigations: (1) The pollination of the Pomaceous Fruits, including the Gross Morphology of the Apple, Fruit-Bud Development of the Apple; Variation of the Internal Structure of Apple Varieties, etc.; (2) Irrigation work with apples and pears; (3) Experiments with stocks of prunes; (4) Problems of both winter and summer pruning; (5) Strawberry variety tests; (6) Cover-crop investigations; (7) Fertilizer investigations; (8) Breeding investigations with cherries, apples, prunes, and strawberries; (9) Investigations in orchard economics; (10) Vegetable gardening investigations with greenhouse tomatoes, onions, and type selection for canning; (11) Investigations with by-products of fruits and vegetables; (12) Investigations in the relation of depth of planting to mortality of trees; (13) Harvesting and storage investigations with pears.

Poultry Husbandry. Experiments in Poultry Husbandry are chiefly concerned with problems of incubation and with breeding fowls for high average egg production, and for a combination of egg production and meat value. Results in both fields of experimentation have already been remarkable and promise still greater progress toward the objects desired. A new breed, the Oregon, seems to be established with the attributes sought.

Soils. The work in this department includes the following twelve specific investigational projects: Fertility rotations; fertilizer experiments; soil-acidity tests and lime trials; cooperative soil survey; soil correction trials; toxicity of alkali salts to crops; cooperative tillage and soil moisture studies; surveys and feasibility of irrigation and drainage projects; cooperative duty of water and related investigations; experiments in the distribution of water and improvement of irrigation practice; drainage and improvement of wet soils; and evaporation and weather studies in relation to soil production. A comprehensive system of crop rotations and fertilizer trials is being conducted on some fifteen of the chief soils of the State to help develop a permanent system of agriculture. The duty of water and related investigations are conducted co-operatively with the U. S. Department of Agriculture. It is State-wide in scope with agents at Klamath, Redmond, and Burns in Eastern Oregon. The aim is to determine the right amount of water for the chief soil types and leading crops under the main types of farming in the principal irrigated valleys of the State. The surveys to determine the feasibility of proposed drainage or irri-

gation projects are made as demand arises. The experiments in drainage are to determine the most efficient depths and distance apart for placing drains in soils of different types, and for testing the efficiency of bedding drains in straw as compared with soils. Since there are one-half million acres of marsh lands in the State and three million acres of land periodically wet, the value of these investigations is obvious. If efficient drainage added to the value of the land the average determined for this work in the Middle West, the reclamation of the State's wet soils would add at least \$10 an acre to the value of these millions of acres.

Veterinary Medicine. The experimental work of this department has been devoted chiefly to finding means for prevention of sterility in cattle, and to studying the so-called walking disease of horses.

EXTENSION SERVICE

ORLO DORR CENTER, Director

The Extension Service is one of the three great means of expression of the Oregon Agricultural College, whose functions are, resident instruction, experiment and research, and college extension.

The Extension Service is charged with the duty of extending the benefits, advantages, and available information of the College and of the United States Department of Agriculture to every portion of the State and to all those persons who for any reason are unable to come to the College.

The Extension Service includes all forms of off-campus instruction and assistance in those subjects in the College curriculum which lend themselves to extension methods or which can be taken and adapted to the direct needs of the people of the State. The various Extension activities are the means through which information, instruction, assistance, and methods of self-help are carried to all persons, who desire them, at any point within the State. In brief, the Extension Service represents the medium, both independently and in hearty, sympathetic, cooperation with all other organized forces of betterment, for promoting, enlarging, and enriching the agricultural, farm, and home interests of Oregon. No county, town, hamlet, farm, or home need be without some evidence of this helpful service.

To accomplish the objects sought, various methods are employed; namely: Teaching by demonstration, giving of accurate and timely information, organization, planning for social and other recreation, and cooperating with Experiment Station and other organized forces. In a field so large, with such a multiplicity of problems and conditions, and with numerous methods of action, there is grave danger of unwise or wasteful undertakings. To prevent this the law requires the preparation of written plans for work and proposed expenditure of funds. These plans must be approved by the U. S. Secretary of Agriculture and by the President of the Oregon Agricultural College. These detailed plans of work are called projects. They must be approved before they are inaugurated, must be reported on at the close of each fiscal year, and when once adopted and signed cannot be altered or deviated from without the written consent of the authorities of the U. S. Department of Agriculture.

The several distinct lines of work now covered by written projects, from which the citizens of some portion of the State are receiving benefit, include: (1) General Administration and Organization of Extension Service, which also embraces a sub-project, Printing and distribution of Publications; (2) County Agricultural Agents; (3) Home Economics and Emergency Home Demonstration Agents; (4) Boys' and Girls' Clubs; (5) Field Horticulture; (6) Field Dairying and Assistance in Dairy Organization; (7) Farm Management Demonstrations; (8) Field Entomology, Plant Pathology, Bacteriology, and Chemistry; (9) Rural Organization and Marketing; (10) Animal Husbandry; (11) Poultry Husbandry; (12) Farm Crops, Drainage and Irrigation; (13) Farm Labor; (14) Extension Schools, Farmers' and Home-Makers' Week and Meetings, Correspondence Courses, Officiating and Judging at Fairs; (15) Engineering Extension; (16) A General Press Bureau and (17) Personal Information and Advisory Correspondence.

It should not be assumed that these projects cover the only problems of importance within the State. It is the purpose to put into operation and to emphasize those lines of Extension Service that are fundamental to large and important interests of farm or home welfare, or to material agricultural development. It is clearly impossible to give complete and full courses in these lines of work but much that is directly practical, usable, and valuable is available through the Extension Service.

SUMMARY

	Number	Number people reached through this Service in one year.
Lecture Work (one lecture to two-day engagements arranged by requests from communities)	649	58,357
Club Work (lecture engagements)	481	44,393
Demonstrations by Specialists	543	30,297
Farmers' and Home-Makers' Week.....	1	1,283
Demonstration Train	1	3,220
Movable Schools (three- to five-day engagements)	16	11,155
Fair (Exhibitions and Judging)	44	35,040
Conferences	1,579	7,632
Farms visited for personal advisory work	1,498	3,756
Letters written	33,397	33,397
Press Articles prepared	1,106	*221,200
Correspondence courses	19	23
Publications:		
New bulletins	12	
Number pages	194	
Number issued	110,500	*221,000
Reprints	9	
Number pages	55	
Number issued	29,000	*58,000
Barn and silo blueprints	2	37
Miles traveled:		
By rail	146,028	
Otherwise	32,172	
Total number people reached:		
Directly		228,590
* Indirectly		*500,200

Importance of Extension Work in Oregon. The magnitude of the problem of College Extension in Oregon can be fully realized only by keeping in mind that the State has a population of nearly 800,000 distributed over a total area of 95,600 square miles—a territory greater than the combined areas of Illinois and Indiana and almost as great as the combined areas of New York, New Jersey, and Pennsylvania. The State, moreover, has few railroads, and in certain sections is very sparsely settled. The people who are to be reached by extension methods represent the greatest extreme in age, capacity, education, and experience with the climate and the country. Oregon's great diversity in elevation, precipitation, temperature, soil, and climatic conditions, still further complicates the problem of Extension Service, and makes it important in proportion to its complexity.

All persons or communities in the State wishing to make use of the assistance to which they are entitled and which will gladly be given in any of the lines indicated, should communicate with the county representative of the Extension Service (County Agent, Home Demonstration Agent, or County School Superintendent)

direct, or with the Extension Service, Oregon Agricultural College, Corvallis, Oregon, as far as possible in advance of the time the appointment is desired. Short-notice requests may not find the College in position to render the service desired. If an Extension School is desired, be sure to give all particulars pertaining to the time, the nature of the subjects in which the community will be interested, the number of speakers desired, and the plans for the meeting. If a single lecture or demonstration or exhibit is wanted, be equally prompt and explicit.

It must be remembered that while the College is anxious and willing at all times to help all who apply, its staff, facilities, and funds are limited. On this account, the Extension Service is sometimes unable to give aid where it would like most to give it. Requests for instruction or other assistance, however, should not be withheld. The great majority of the State's needs have been, and generally can be, cheerfully and efficiently met.

ADMINISTRATIVE

ORLO DORR CENTER, Director
HAZZLITT VICKERS, Assistant to Director
MARGARET FARQUHAR COOK, Secretary

The administrative work of the Extension Service is vested in a Director and heads of the various departments. The administrative duties consist of planning and coordinating the several lines of Extension work, dividing and assigning funds, planning the Extension campaigns, meetings, schools, conferences, demonstrations, etc., authorizing all Extension publications, planning and arranging exhibits, and supervising the prosecution of all phases of the work. Reports are required covering all lines of Extension Service and periodical reports are made to College officials and other cooperating agencies.

COUNTY AGENT WORK

PAUL VESTAL MARIS, State Leader
WALLACE LA DUE KADDERLY, Assistant State Leader

The largest branch of the Extension Service at the present time is the County Agent work. In charge of this division is the State Leader and Assistant State Leader. Prosecuting the work throughout the State are 26 County Agents, covering 27 counties, each agent being charged with the development of the agricultural interests of the county over which he has jurisdiction.

The work is conducted under the authorization of Section 3 of Chapter 10 of the Session Laws of Oregon for 1913. Counties with areas of less than 5000 square miles may appropriate up to \$2000 for the employment of an agent and maintenance of his office and larger counties may appropriate up to twice that amount. The State duplicates the county appropriation and in addition to the county and State money there is also available the county's proportionate share of such federal funds as are allotted to the State of Oregon for this purpose. Since the war the allotments have been increased until it is hoped that each county will receive approximately \$1000 of federal money during the year 1918. The average county appropriation is approximately \$1700. The provisions of the Oregon law place the County Agent work under the direct supervision of the Agricultural College.

Counties not provided with county agents and interested in securing them should correspond directly with the Director of Extension Service or the State Leader of County Agents, who will render every assistance possible in explaining the plan and methods of work and necessary steps to be taken in establishing it.

The Work of the County Agent. The first duty of the County Agent is to build up an organization through which his work may be carried on effectively. In doing this the cooperation of the Granges, Farmers' Unions, and established organizations, is solicited; and what are known as County Agricultural Councils, made up of representatives from these various organizations are instituted. As these organizations are now conceived, they will assist with other Extension activities in the county, such as Home Demonstration work and Boys' and Girls' Club Work. A section of the Council known as the Agricultural Committee will assist the County Agent in preparing a program designed to meet the principal agricultural problems of the county. This program may include the formation of marketing organizations, such as cattle shippers' associations, potato growers' associations, etc., or the organization of drainage districts, conducting practical farm demonstrations pertaining to the management of soils, crops, live stock, and orchards, or the control of insect pests and contagious animal diseases.

The County Agent, in short, establishes a center of local agricultural interests. He maintains a central office in which is assembled information pertaining to the agriculture of the com-

munity. He is the representative of the United States Department of Agriculture, the State Agricultural College and the county in which he is located, and through the union of these forces he is able to apply the fullest measure of practical and scientific knowledge to the solution of the problem and the improvement of the country-life conditions. Similar sections of the Council assist the Home Demonstration Agent and the Club Representatives in their respective lines of work.

So important has the work of the County Agent become that the Government is making every effort to extend the organization to every agricultural county in the United States as a war measure.

HOME ECONOMICS

ANNA MAE TURLEY, State Leader of Home Economics Extension and Emergency Home Demonstration Agents.
JESSIE DUNLAVY McCOMB, Assistant State Leader Emergency Home Demonstration Agents.

Home Economics Extension offers a means by which the homemakers of the State may call upon the College for assistance in solving their special problems. This work is planned, first, to meet the demand of Oregon women who are interested in all subjects related to the home and better living conditions; and second, to create a greater interest in these subjects concerning the vital problems, three of which are:

1. Food—selection, preparation, and use.
2. House—arrangement, decoration, and conveniences.
3. Clothing—methods of removing stains, simple tests for wool, cotton, linen, and silks, selection, preparation, and use.

On August 16, 1917, seven Emergency Home Demonstration Agents were appointed in Oregon and assigned to their respective territories, covering in all eighteen counties. The Agents' principal problem at the beginning has been the organization of the people for wide-reaching and effective community campaigns in meeting the requirements of the Nation in the food crisis.

Campaigns are conducted along various lines of home economics in conformity with the request of the Food Administrator including War Emergency Food Surveys, Dietary Studies, Hoover Pledge Card Campaigns, Household Conservation and Thrift Lessons, Food Preservation Campaigns, and Demonstration of substitutes.

BOYS' AND GIRLS' CLUB WORK

HARRY CASE SEYMOUR, State Leader
HELEN JULIA COWGILL, Assistant State Leader
LEONARD JOHN ALLEN, Assistant State Leader Pig Club Work
ALPHONSUS O'REILLY, Assistant State Leader
ALICE JOYCE, Assistant State Leader
PHILLIP TUTHILL FORTNER, Assistant State Leader, Pig Club Work
Other State and County part time Assistants

The Junior Extension activities of the Oregon Agricultural College take the form of club and contest work among the boys and girls. Those who are, or can be, interested in the basic farm and home enterprises, such as the growing of plants, the rearing of animals, or the work in home economics, are encouraged to enroll for one or more Club projects.

The Club project, which is to be worked out at home, may take the form of growing one-sixteenth of an acre or more of corn, potatoes, vegetables, etc.; the management of a brood sow and litter, or a single pig; sheep raising; raising a flock of chickens; keeping a milk and feed record on a herd of dairy cows; the completion of ten lessons in sewing, baking, food preparation, or canning—14 different projects in all.

Assistance is rendered, enthusiasm aroused, and interest sustained in the work by means of Club meetings, circulars and bulletins, and personal visitation by local, county, and State Club leaders.

Prizes are offered to the winners in Club projects at the local, county, and State Club festivals and fairs. The Club members are made to see, however, that the most worth-while prizes are the knowledge, skill, and profit that each one may derive from the work.

Club work in Oregon is maintained and supervised by the Oregon Agricultural College Extension Service in cooperation with the U. S. Department of Agriculture, and the State Department of Education. The activities of all these agencies are focalized in a State Leader of Club work, who is a member of the Extension Service staff, and to whom all inquiries regarding Club work should be addressed.

HORTICULTURE

WALTER SHELDON BROWN, Extension Specialist in Horticulture.

Extension Horticulture covers the whole subject of orchard operations, including cultivation, pruning, spraying, thinning, harvesting, and marketing, laying special emphasis upon the vital question of reducing the cost of producing and handling fruits.

Small fruits and vegetables will have their share of attention and the improvement of the surroundings of our farm homes will be emphasized as a matter of great importance.

Improvement in the quality of the exhibits of county and community fairs, better arrangements of such exhibits, and a clearer and more uniform method of classification of exhibits is a subject that will be given considerable attention.

Special emphasis will be laid upon two series of projects or farm schools—one for pruning and one for spraying. This work contemplates having the operations of pruning and spraying, under field conditions, performed by members of the classes enrolled under the direction of the Extension Horticulturist.

DAIRYING

EDWARD BLODGETT FITTS, Extension Specialist in Dairy Husbandry
EDGAR LEROY WESTOVER, Dairy Husbandman

Extension Dairying carries throughout the State, and helps to put into effective use, information regarding all branches of the dairy industry, such as the care and management of the herd, the raising of the calf, the construction of buildings, the breeding and feeding of cattle, the treatment of diseases, the care of milk and cream, and the manufacture of dairy products. Special emphasis and aid is given toward effecting dairy cooperative organizations such as Cow Testing Associations, Breeders' Associations, Bull Associations, Farmers' Cooperative Creameries, Farmers' Cooperative Cheese Factories, and Farmers' Cooperative Cream Selling Agencies.

FARM MANAGEMENT DEMONSTRATIONS

(Farm Management Demonstrator to be appointed.)

The purpose of the department of Farm Management Demonstrations is to demonstrate to farmers, in connection with their own farms, a practical and efficient method of summarizing and

analyzing a farm business as a means of measuring the profit or loss incurred in conducting it and of deciding upon readjustments that promise to increase its net income.

In a management demonstration the business of each farm in a community is analyzed from an economic standpoint and then compared with the others to determine some of the changes which should be made in its organization to make it more profitable.

The Federal Income Tax makes necessary a more careful study of farm accounts and keeping of more accurate records. Special attention will be given to meet this requirement through the farm record work and farm business analysis.

FIELD ENTOMOLOGY, PLANT PATHOLOGY, BACTERIOLOGY, CHEMISTRY, ZOOLOGY, ETC.

(Specialists from these College Departments.)

The Extension Service in the several sciences covered includes personal conferences and information, lectures, demonstrations, correspondence, and reports.

In entomology particular attention is given to the control of orchard and garden insect pests, field-crop pests, stored-product insects, and to apiculture. Onion smut problems, cereal smut, its control and prevention, grain rusts, and general disease identification, control and eradication of all classes of poisonous plants is given consideration by the plant pathologists. Special cooperation and assistance is rendered through the department of Bacteriology in the preparation and distribution of legume bacteria, through control of serious contagious disease both human and animal and in conjunction with State departments in determining milk supply contamination and control.

The other departments render similar service along their particular lines.

ORGANIZATION AND MARKETS

HECTOR MACPHERSON, Extension Specialist in Organization and
Markets.
FRANK LLEWELLYN BALLARD, Field Organizer.

The Extension Service Bureau of Organization and Markets takes up the investigation and marketing problems which are confronting the farmers of the State. One man is in the field constantly, working with the farmers who are attempting, through

organization, to better their conditions. Other members of the staff are sent out on definite organization projects, such as creamery and cheese factory organizations. It is the aim of this department to help farmers organizations to get started in such a way as to accomplish the most good with the least possible risk and outlay.

Systematic instruction is being carried on through extension lectures, press bulletins, and personal conference covering the whole field of marketing and rural credits.

ANIMAL HUSBANDRY

(Animal Husbandman to be appointed.)

Extension Animal Husbandry takes up all problems connected with the improvement of beef cattle, horses, swine, sheep, and goats. The slogan is "Better breeding and more efficient feeding." Information is gathered from many sources and distributed throughout the State. The Extension work in animal husbandry is being much strengthened through the rapid accumulation of valuable live-stock data by the Experiment Station at Corvallis and by the Eastern Oregon Branch Experiment Station at Union. The great diversity of conditions in various parts of the State is given due consideration and the work planned to fit the particular locality where given.

POULTRY HUSBANDRY

*CHARLES STOCKTON BREWSTER, Extension Specialist
in Poultry Husbandry.

Extension Poultry Husbandry covers all the branches of the poultry industry in a practical way as they apply to actual farm conditions in the State.

The work embraces such subjects as breeds and methods of breeding; feeds and methods of feeding; methods of housing and management of fowls for egg production and for market; hatching and rearing chickens; marketing of poultry and eggs. Particular emphasis will be laid upon the breeding of fowls for egg production.

Through cooperation with County Agents an effort will be made to hold special demonstrations in caponizing and in selecting and culling laying hens.

The general aim is to help the poultry raisers to produce better eggs and more of them at less cost.

* Devotes one-half time to Resident Instructional work.

FARM CROPS

(Field Specialist in Farm Crops to be appointed.)

Farm-crops Extension work covers the bulk handling of grain, the grading and classification of grain, potatoes, hay, etc., the selection of land for cropping purposes, the preparation of soil, seed selection, planting, culture, harvest, and storage methods for grain, potatoes, beans, peas, corn, flax, and other crops and forage plants, as well as potato certification, seed inspection, crop rotation, and special crop problems. This service is given through personal advisory conferences, special demonstration, lectures, institutes, bulletin, correspondence, and extension schools.

DRAINAGE AND IRRIGATION

*WILBUR LOUIS POWERS, Extension Specialist in Drainage and Irrigation.

Drainage includes the soil management subsequent to installing drains as well as drainage construction work. Assistance is given in planning drainage systems as well as through personal demonstrations in the laying out of drainage systems for individuals and communities. Information is given through lectures, extension schools, personal conference, and correspondence. Assistance and advice is also given in the organization of feasible drainage districts.

Irrigation includes the economic use of water, handling of soils and crops under irrigation, removal of alkali by drainage, and like matters. Assistance is rendered in this work as outlined above under drainage. Design of farm distribution systems and individual pumping plants and organization of irrigation districts where feasible are among the activities of this division.

FARM LABOR

JOHN WILLIAM BREWER, Farm Labor Specialist

The Farm Labor Specialist determines labor shortage and assists in supplying this shortage as far as may be possible. Cooperative agencies in this work are the U. S. Department of Agriculture, State Labor Commissioner, County Agricultural Councils, County Agents, County Councils of Defense, Portland Municipal Employment Bureau, and such other forces as are concerned in this field

* Part time instructional work at College.

of work. This Extension Specialist is a direct representative of the U. S. Department of Agriculture in Oregon and is in charge of all farm labor surveys, farm labor problems, and related matters. He is a member of the Extension Service through cooperative project agreement. The Farm Labor Specialist is directing the efforts of the U. S. Boys' Working Reserve in the State.

EXTENSION SCHOOLS, LECTURES, AND CORRESPONDENCE COURSES

HAZZLITT VICKERS, Assistant to Director

Extension Schools. Extension Schools along definite project lines are organized in various sections of the State. These schools are arranged in such way that they may continue from year to year at the same points and yet not repeat the work previously given. The length of time spent at each place is dependent upon the subject matter to be handled in each case.

Extension Lectures. Lectures will be furnished local organizations upon request through County Agents and Home Demonstration Agents in territory occupied by these agents, or direct through the Extension Service in case there is no agent in the territory. In all lecture work it is desirable both as regards economy and efficiency to arrange the work in circuits.

While it is impossible to give a complete list of the courses and subjects offered through Extension Schools and Extension Lectures, an attempt will be made to furnish instruction in all lines of agriculture, home economics, commerce, engineering, and forestry, and such other lines of work as come within the curriculum of the Oregon Agricultural College which can be effectively taught without resident instruction requirements.

Fair Judging and Exhibits. Judges will be furnished fairs as far as this is possible with the limited staff available. Exhibits will also be made at a few large fairs.

All the work outlined above is arranged directly through County Agricultural Agents, Home Demonstration Agents, and other representatives of the Extension Service in the territory from which requests are received. Requests may be sent either to the Agents or to the Extension Service, Oregon Agricultural College, Corvallis, Oregon.

Correspondence Courses. The aim of the Extension Service of the Oregon Agricultural College in offering correspondence courses is to reach those who cannot be reached otherwise, but who are seeking special information along such lines of work as can be taught through correspondence. Courses are offered only in such subjects as will prove of practical benefit to those who are interested in the special subject taken up.

It is assumed in the courses offered that the student has only a general acquaintance with the subject pursued and that he desires a practical working knowledge of it. Subjects, therefore, will be presented in simple and direct language.

The following courses are offered:

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|---|---|
| 1. Farm Accounting. | 10. Accounting. |
| 2. Rural Law. | 11. Farm Arithmetic. |
| 3. Rural Economics. | 12. Gas Engines. |
| 4. Advertising and Selling. | 13. Concrete Construction on the Farm. |
| 5. Cooperative Accounting and Management. | 14. Shop Arithmetic. |
| 6. Business Organization and Management. | 15. Shop Drawing. |
| 7. Business Management for Women. | 16. Electricity and Magnetism. |
| 8. Business Law. | 17. Heat and Its Mechanical Transformation. |
| 9. Bookkeeping. | 18. Farm Irrigation Practices. |
| | 19. Farm Drainage. |

Additional courses in other subjects will be added from time to time as demands are made for them. Students may begin correspondence courses at any time during the year. No preliminary examination is required for enrollment.

Students desiring to enroll in any courses offered, should write to the Extension Service, Oregon Agricultural College, Corvallis, Oregon, for the special circular on Correspondence Courses.

ENGINEERING

(Specialists from the Faculty of the School of Engineering.)

Technical courses in engineering are given in Portland both to professional and operating engineers. Such courses include the measurement of water, pipe lines, and protective devices, types and uses of pumping equipment, the design of power and pumping plants, electricity and electrical engineering, steam and gas engineering, refrigeration, thermo-chemistry, thermics, engineering and design of power plants, engineering finance and cost analysis, and engineering mathematics.

Extension Highway Engineering offers its assistance to the county courts, road officials, and citizens of the State generally in attaining a higher standard in road construction and maintenance.

Lectures and demonstrations are given before meetings of county road officials and citizens' organizations on construction and maintenance of all the ordinary types of roads in common use, including consideration of drainage, alignment, and approved methods of construction.

Personal examinations, laboratory tests, and reports on road building materials are also features of the work done.

PRESS SERVICE

CHARLES JARVIS McINTOSH, Editor Press Bulletins

The Extension press service assists in getting the valuable information developed by the research specialist out to the farms, factories, offices, homes, and schools where it is most needed. The monthly "Extension News" containing seasonal information in popular language is sent to the entire Extension mailing list consisting of some 20,000 names and to all newspapers and other periodicals of Oregon; also to a select list of about four hundred publications in the Northwest and other parts of North America. This information reminds farmers and other operators of the need of certain practice, and instructs them in the best methods of applying it. The department sends stenciled stories to all the dailies of the State once a week, a College news letter weekly to many of the leading metropolitan dailies of the United States, many specials to the newspapers in Portland as well as other places in the State, and comprehensive articles of technical nature to hundreds of class publications. The department also supervises student special correspondence. Special announcements of field work are furnished newspapers of the communities visited by field specialists.

ROSTER OF OFFICERS

Military Department, 1917-18.

COMMANDANT OF CADETS

Captain THOMAS FRANCIS MAGINNIS, U. S. Army, Retired.

ASSISTANT COMMANDANTS OF CADETS

Captain DENIS HAYES, A. G. N. A., on leave.

First Lieutenant CYRUS F. DUGGAR, A. G. N. A., on leave.

CADET OFFICERS

C. A. McCOLLUM, Colonel.

A. H. AMIS, Lieutenant Colonel.

T. P. CRAMER, Major, First Battalion.

C. A. THOMPSON, Major, Second Battalion.

L. W. COLEMAN, Major, Third Battalion.

H. W. COOPER, Major, Second Battalion.

C. L. FIRESTONE, Major, First Battalion.

STAFF

V. L. PLUE, Regimental Adjutant.

E. W. McMINDES, Regimental Adjutant.

E. W. DYE, Inspection.

ERIC ENGLUND, Inspection.

C. S. NESBITT, Inspection.

W. J. KOCKEN, Bayonet Instruction.

W. A. RUNYAN, Engineering.

H. E. CURREY, Hospital.

S. H. MYERS, Signal Corps.

C. L. PAINE, Supply.

CAPTAINS

L. T. Chellis, Co. "G"

R. O. Coleman, Co. "K"

G. L. Corey, Co. "M"

F. A. Gilfillan, Co. "D"

L. R. Guthrie, Co. "L"

L. Happold, Cos. "I" and "L"

A. O. Meier, Co. "A"

L. B. Moore, Co. "H"

T. J. Porter, Co. "D"

D. W. Ritchie, Co. "E"

A. J. Schoth, Co. "E"

R. Selph, Co. "F"

W. R. Stow, Cos. "D" and "L"

A. J. Woodcock, Co. "B"

FIRST LIEUTENANTS

C. F. Beatie, Adj., First Bat'l'n.	M. O. Kurtz, Adj., Third Bat'l'n.
G. W. Carpenter, Co. "C"	D. F. McEwen, Co. "H"
W. S. Carpenter, Co. "K"	H. B. Morris, Signal Corps
E. H. Chapman, Adj., Sec. Bat'l'n.	M. Newman, Athletics
L. K. Couch, Co. "F"	D. N. Nordling, Co. "G"
H. W. Ferguson, Co. "L"	A. Ostrander, Adj., First Bat'l'n.
H. D. Ford, Hospital	L. H. Paine, Co. "I"
N. K. Ford, Co. "M," Eng.	R. F. Shaw, Adj., First Bat'l'n.
A. C. Jetley, Co. "H"	L. M. Stark, Headquarters
W. Johnson, Co. "G"	O. L. Straughn, Co. "L"
L. B. Kiddle, Cos. "E" and "M"	R. K. Wilmot, Engineering

SECOND LIEUTENANTS

C. L. Atwood, Supply	J. D. Moberg, Co. "L"
C. L. Corum, Co. "M," Inspection	A. W. Oliver, Co. "F"
R. E. Jones, Co. "M"	B. G. Thompson, Co. "D"
E. F. McCormack, Co. "K"	H. W. Thoms, Co. "K"
W. L. McGeorge, Co. "B"	J. M. Underwood, Co. "I"
C. W. Meyers, Co. "C"	

CATALOGUE OF STUDENTS

(The following abbreviations are used to indicate the course in which the student is registered and the classification within the course: Agri., Agriculture; C. E., Civil Engineering; Com., Commerce; H. E., Home Economics; E. E., Electrical Engineering; For., Forestry; L. E., Logging Engineering; Hi. E., Highway Engineering; I. E., Irrigation Engineering; I. A., Industrial Arts; M. A., Mechanic Arts; M. E., Mechanical Engineering; Min., Mining Engineering; Phar., Pharmacy; Fr., Freshman; Soph., Sophomore; Jr., Junior; Sr., Senior; Voc., Vocational; Opt., Optional; Spec., Special.)

GRADUATE STUDENTS

Name	Course	Home Address
Adams, M. Etta..... (Oregon Agricultural College)	H. E.....	Corvallis
Anderson, J. Norma..... (Oregon Agricultural College)	Agri.....	Portland
Bell, James Carscallan..... (Montana State College)	Agri.....	Kendall, Mont.
Black, A Burr..... (Oregon Agricultural College)	Agri.....	Corvallis
Bregger, John Taylor..... (Michigan Agricultural College)	Agri.....	Bangor, Mich.
Buckman, Lewis Taylor..... (Massachusetts Agricultural College)	Agri.....	Wilkes Barre, Pa.
Chandler, Edith Eleanor..... (Wellesly College)	H. E.....	Kenilworth, Ill.
Chang, Clifton Tse..... (Cornell University)	Agri.....	Tientsin, China
Gilfillan, Francois Arch..... (Oregon Agricultural College)	Phar.....	Delmar
Gorrie, Agnes Beals..... (Oregon Agricultural College)	H. E.....	Corvallis
Hawkins, Leon Abbott..... (New Hampshire College)	Agri.....	Plymouth, N. H.
Hooper, John Amos..... (Oregon Agricultural College)	E. E.....	Amboy, Wash.
Hursh, Charles Raymond..... (University of Missouri)	Agri.....	Jonesboro, Ill.
Maris, Homer W..... (University of Oregon)	Agri.....	Portland
Miller, Fred W..... (Ohio State University)	Agri.....	Corvallis
Parpala, Taimie Armas..... (Oregon Agricultural College)	Agri.....	Nasal, Wash.
Pitman, John E..... (Oregon Agricultural College)	Agri.....	Fairmont, Calif.
Porter, Ted John..... (Oregon Agricultural College)	Agri.....	Halsey
Singh, Mahadoc..... (Oregon Agricultural College)	Agri.....	Ondh, India
Soo, Taki Herbert..... (Oregon Agricultural College)	Agri.....	Portland

UNDERGRADUATE STUDENTS

Name	Course	Rank	Home Address
Abbott, Christine Gordon	H. E.	Jr.	Caldwell, Idaho
Abbott, Gurnsey Harlan	Agri.	Soph.	Parma, Idaho
Abegg, Fred Anton	Agri.	Soph.	Portland
Abraham, Julia Dorothea	H. E.	Fr.	Roseburg
Absher, Albert	Agri.	Soph.	Mt. Grove, Mo.
Acheson, Myrtle Evangeline	H. E.	Fr.	Chehalis, Wash.
Adams, Floyd Nelson	Agri.	Soph.	Hardman
Adkison, Russell Sage	Agri.	Fr.	El Toro, Calif
Aeils, Margaret Katherine	Com.	Fr.	Dayton, Wash.
Agee, Leta Violet	H. E.	Fr.	Pendleton
Agosti, Alfred P.	Hi. E.	Jr.	Portland
Ahlson, Alete	H. E.	Fr.	Hillsdale
Ahlson, Charles Boone	Agri.	Jr.	Hillsdale
Alcorn, Dale S.	Agri.	Fr.	Corvallis
Alderman, Clifford	Min.	Jr.	McMinnville
Alderman, Margaret	H. E.	Voc.	Dayton
Aldrich, Roy	Min.	Fr.	Tacoma, Wash.
Alexander, Constance	Phar.	Soph.	Portland
Alexander, Ethel Marjorie	H. E.	Soph.	Salem
Alexander, George Maxfield	Agri.	Jr.	Salem
Alexander, Harry James	Agri.	Soph.	Chehalis, Wash.
Alicante, Marcos M.	Agri.	Soph.	Philippine Islands
Allen, Davis John	Agri.	Voc.	Corvallis
Allen, Ella Lorene	H. E.	Fr.	Lostine
Allen, Sam S.	For.	Voc.	Portland
Altstadt, George John	For.	Soph.	Portland
Alter, Hobart R.	Agri.	Soph.	Ontario, Calif.
Amis, Albert Hope	Agri.	Sr.	Shandon, Calif.
Anawalt, Clinton La Verne	Agri.	Jr.	Jordan Valley
Anderson, Anna Elaine	H. E.	Voc.	Ilwaco, Wash.
Anderson, Ellen Caroline	H. E.	Fr.	Portland
Anderson, Elmer Edward	Agri.	Fr.	Lake
Anderson, Martin	M. E.	Spec.	Sweden
Anderson, Juliette Norma	Agri.	Sr.	Portland
Anderson, Otto Erwin	Agri.	Fr.	Ilwaco, Wash.
Anderson, Edwin Caldwell	Agri.	Jr.	Corvallis
Andrews, Abby	H. E.	Spec.	Corvallis
Andrews, Kenneth Cutter	Com.	Fr.	Oregon City
Appelman, Ruth Marguerite	Com.	Fr.	Corvallis
Archibald, Raymond	Hi. E.	Jr.	Albany
Ariss, Dorothy Crosfield	H. E.	Soph.	Portland
Armistead, Amy Isabella	H. E.	Jr.	Portland
Armstrong, Fay	H. E.	Sr.	Corvallis
Armstrong, Sam Walter	M. E.	Soph.	Bandon
Arnett, Wilson	Com.	Jr.	Ontario, Calif.
Arnold, Maude Rita	H. E.	Spec.	Centralia, Wash.
Arthur, Ernest Chas.	Agri.	Fr.	McMinnville
Ash, Minna Carolyn	Com.	Soph.	La Grande
Aspinwall, Harold McKinley	Agri.	Fr.	Salem

Name	Course	Rank	Home Address
Asplund, Esther Charlotte	Com.	Fr.	Marshfield
Atwood, Alice Lillian	H. E.	Soph.	Corvallis
Atwood, Cyrus Leslie	Com.	Sr.	Corvallis
Averill, Warren Lamson	Agri.	Spec.	Corvallis
Avery, Joseph Conant	C. E.	Fr.	Klamath Falls
Avrit, Roy Calvin	E. E.	Fr.	Corvallis
Axtell, Edith Elizabeth	Com.	Spec.	Corvallis
Axtell, Frances Joy	Com.	Spec.	Corvallis
Babb, Bert Graydon	Agri.	Fr.	Eugene
Bacon, Runa Elizabeth	Com.	Jr.	La Grande
Backman, Emil	Agri.	Fr.	Marshfield
Badger, Raymond Eugene	Agri.	Fr.	Oakland, Calif.
Bagley, Ferris	For.	Soph.	Salem
Bailey, Lawrence Dudley	For.	Spec.	Portland
Bailey, Lester William	Agri.	Spec.	Gladstone
Bailey, Mamie Evelyn	Com.	Fr.	The Dalles
Bailiff, Edith Dorothy	Com.	Soph.	Corvallis
Bain, Walter Marion	Chem. E.	Soph.	Portland
Baker, Charles Eugene	Agri.	Soph.	Los Angeles, Calif.
Baker, Rufus William	Agri.	Spec.	Oregon City
Balbach, John Ray	Agri.	Fr.	Portland
Balderee, Caryl Dorothy	Com.	Fr.	Corvallis
Baldwin, James Daniel	Agri.	Sr.	Blue Lake, Calif.
Ball, Ted M.	Agri.	Fr.	Corvallis
Ball, Harold Franklin	C. E.	Soph.	Portland
Bamford, Floyd V.	Com.	Voc.	Portland
Banton, Raymond Edward	I. A.	Fr.	Monroe
Barker, Guy Edwin	Com.	Soph.	Cove
Barker, Mary Elizabeth	H. E.	Sr.	Oakland, Calif.
Barnard, Gordon T.	Agri.	Voc.	Fossil
Barnes, Richard Lea	For.	Fr.	Portland
Barnett, Harlan Adair	For.	Spec.	Florence
Barnum, Marion Elizabeth	Com.	Fr.	Medford
Barratt, Marjorie Marian	H. E.	Jr.	Portland
Barrows, Orvil Clifford	M. A.	Voc.	Marshfield
Barrows, Ruth Jane	H. E.	Fr.	Marshfield
Bartholomy, Lester John	Agri.	Fr.	Drain
Barton, Bess	H. E.	Sr.	Puyallup, Wash.
Bartu, Frank	M. E.	Sr.	Crabtree
Bates, Douglas Ivan	E. E.	Sr.	Corvallis
Bates, Mabel Gould	H. E.	Opt.	Corvallis
Bayley, Carrie M.	Com.	Spec.	Eugene
Beagle, Glenn Elwood	Agri.	Soph.	Holland
Beall, Malcom	Agri.	Soph.	Portland
Beals, Erma Elizabeth	H. E.	Soph.	Corvallis
Beals, Ora Fern	Com.	Fr.	Corvallis
Beatie, Charles Fountain	C. E.	Sr.	Oregon City
Beaty, Leslie	Agri.	Spec.	Walkerton, Ind.
Bechen, Ella	Com.	Jr.	Hillsboro
Beck, John George	Min.	Spec.	Astoria
Beck, J. Ralph	Agri.	Jr.	Corvallis

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Becker, Lorette Clare.....	Phar.	Fr.	Corvallis
Beckwith, Naomi Allatt.....	H. E.	Soph.	Salem
Beebe, Sadie Elizabeth.....	Com.	Soph.	Central Point
Beers, Ruby Evangeline.....	H. E.	Sr.	Corvallis
Behnke, Carl Henry.....	Agri.	Jr.	Sunnyside, Wash.
Belfils, Harriette Urso.....	Com.	Fr.	Estacada
Bell, George Foster.....	Agri.	Fr.	Corvallis
Bellinger, Wilbur Moore.....	Agri.	Jr.	Moscow, Idaho
Belt, Walter K.....	Agri.	Soph.	Corvallis
Bendler, Georgine Bertha.....	H. E.	Jr.	Cornelius
Benedick, Arthur Harold.....	M. E.	Fr.	Hermiston
Benner, Robert Lenox.....	Agri.	Spec.	Oakland, Calif.
Bentson, Faye.....	Phar.	Voc.	Silverton
Beougher, Ethel Olive.....	H. E.	Fr.	Crabtree
Berchtold, Florence.....	H. E.	Jr.	Corvallis
Bernard, Noemi Yvonne.....	H. E.	Soph.	The Dalles
Biersdorf, Edgar Alwin.....	Agri.	Fr.	Portland
Billeter, Calvin.....	E. E.	Fr.	Portland
Billeter, Paul Edward.....	Com.	Soph.	Portland
Billingsley, Neve.....	H. E.	Fr.	Ontario
Bingham, Curtis Harry.....	Agri.	Fr.	Alhambra, Calif.
Bissett, Lee Henry.....	Agri.	Sr.	Hebo
Bitney, Dewey Hobson.....	M. E.	Fr.	Woodburn
Bixby, John Snell.....	Agri.	Soph.	Freewater
Black, Emerson P.....	Agri.	Sr.	Corvallis
Black, Ethel G.....		Opt.	Corvallis
Black, Grace Mae.....	Com.	Spec.	Mt. Vernon
Black, Kathleen.....	H. E.	Jr.	Medford
Blair, Erwin W.....	Com.	Fr.	Long Beach, Calif.
Blake, Marjorie Elizabeth.....	H. E.	Soph.	Salem
Boardman, Leo Woodward.....	Agri.	Spec.	Chicago, Ill.
Bock, Fred Neale.....	M. E.	Spec.	Condon
Bobzien, Helen Carolyn.....	H. E.	Fr.	Grants Pass
Bodine, Roger C.....	For.	Jr.	Pasadena, Calif.
Bodle, Orval.....	E. E.	Soph.	Bay City
Bodner, Michael James.....	E. E.	Fr.	Raynesford, Mont.
Boehmer, Karl C.....	For.	Soph.	Portland
Boetticher, Marion Louis.....	Chem. E.	Fr.	Albany
Bogard, Troy.....	Agri.	Sr.	Woodburn
Boge, Charles.....	Min.	Fr.	Cornelius
Bolin, Frank Gerald.....	Agri.	Sr.	Portland
Bollen, Walter Beno.....	Agri.	Soph.	Portland
Bolton, Dorothy Townsend.....	H. E.	Fr.	Pasadena, Calif.
Bolton, Genevieve.....	H. E.	Jr.	Seattle, Wash.
Bond, Mona.....	Phar.	Soph.	Halsey
Bonner, George.....	Agri.	Jr.	Brighton, England
Boord, Opal Irene.....	H. E.	Fr.	Corvallis
Bouquet, Grace.....	Opt.		Corvallis
Bower, Hazel Harriet.....	Opt.		Corvallis
Boyakin, Joseph S.....	E. E.	Fr.	Nehalem
Boyce, Ruth Esther.....	Com.	Fr.	John Day

Name	Course	Rank	Home Address
Brach, August Theo.....	Agri.	Soph.	Astoria
Bracher, Karl Fredric.....	For.	Soph.	Portland
Bradley, Pearl R.....	H. E.	Soph.	Woonsocket, S. D.
Branstetter, Myrtle Esther.....	Phar.	Spec.	Echo
Braun, Elsie M.....	H. E.	Soph.	Portland
Breese, Roy Arthur.....	Agri.	Soph.	Red Bluffs, Calif.
Breithaupt, Alva.....	Agri.	Jr.	Portland
Breanan, Andrew F.....	For.	Jr.	Boise, Ida.
Brewer, Ruth Hannah.....	H. E.	Soph.	Chemawa
Brinkerhoff, Ethel Anita.....	H. E.	Sr.	Piedmont, Calif.
Briscoe, Gladys Fern.....	Com.	Fr.	Weiser, Idaho
Brittan, Joe M.....	Agri.	Soph.	Cornig, Iowa
Brook, Erma Millicent.....	H. E.	Spec.	Portland
Brown, Clara Janet.....	Opt.		Corvallis
Brown, Frank Kimball.....	Agri.	Soph.	Salem
Brown, Frances Roberta.....	H. E.	Soph.	Haines
Brown, Nina Marion.....	H. E.	Soph.	Belfield, N. D.
Brown, Oliver Ellis.....	Com.	Soph.	Philomath
Brown, Ruth Elizabeth.....	H. E.	Soph.	Ithaca, Mich.
Brown, Rowland Seth.....	Com.	Spec.	Philomath
Brown, Shirley Grace.....	H. E.	Fr.	Corvallis
Brown, Veda Alice.....	H. E.	Fr.	New Era
Brugger, Anna Marie.....	H. E.	Fr.	Gresham
Bryan, Elaine.....	H. E.	Soph.	Portland
Bryan, Leon H.....	Agri.	Soph.	Fort Jones, Calif.
Bryant, Theodore L.....	Min.	Fr.	Ladysmith, B. C.
Brye, Irene Anna.....	H. E.	Soph.	Auburn, Calif.
Buchner, Lynn Charles.....	M. E.	Fr.	Ontario
Buchner, Olive Dorothea.....	H. E.	Fr.	Salem
Bullard, Frank Wesley.....	Com.	Fr.	Bullards
Burnap, Walter James.....	Com.	Voc.	Corvallis
Burnap, Florence De Eette.....	H. E.	Soph.	Corvallis
Burris, John H.....	Phar.	Fr.	Salem
Burt, Uriel S.....	Com.	Fr.	Corvallis
Bush, Carl L.....	Agri.	Soph.	Hoskins
Bush, Zetta Zoretta.....	H. E.	Jr.	Hoskins
Bushman, John Harry.....	M. E.	Fr.	Eugene
Butler, Guy H.....	Chem. E.	Fr.	Albany
Butt, Frederick E.....	Agri.	Soph.	Parkplace
Butterfield, George Aubrey.....	E. E.	Fr.	Weiser, Idaho
Buttervich, Vincent Floyd.....	Agri.	Soph.	Fairbanks, Alaska
Byers, Oscar L.....	For.	Sr.	Portland
Cady, Alice Ellen.....	Com.	Fr.	Corvallis
Cairncross, Helen Elizabeth.....	Com.	Fr.	Buhl, Idaho
Caldwell, Harold T.....	M. E.	Soph.	Pomona, Calif.
Cameron, Eckford.....	Com.	Fr.	Gresham
Cameron, James Maurice.....	Agri.	Fr.	Portland
Campbell, Ralph H.....	Agri.	Fr.	Amity
Canfield, Alfred Clarke.....	Agri.	Fr.	Albany
Cantrall, Otto Lamar.....	E. E.	Soph.	Ruch
Carder, Dean Samuel.....	Chem. E.	Fr.	Medford

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Name	Course	Rank	Home Address
Carlberger, Axel	Com.	Voc.	Portland
Carlson, Arthur Albert	E. E.	Soph.	Portland
Carlson, Howard	Com.	Soph.	Butte, Mont.
Carlson, Elsie Elmer	Com.	Spec.	Mulino
Carlson, Jennie G.	H. E.	Fr.	Marshfield
Carlyle, Mildred	H. E.	Jr.	Forest Grove
Carnes, Deirdre	H. E.	Soph.	North Powder
Carney, William Edward	For.	Spec.	Huff, Pa.
Carpenter, George W. C.	M. E.	Sr.	Washougal, Wash.
Carpenter, Walter Squire	Agri.	Sr.	Ashland
Carroll, Richard Eldon	Phar.	Soph.	Harrisburg
Carter, Claire Mary	H. E.	Jr.	Aberdeen, Wash.
Carter, Harold Samuel	C. E.	Soph.	Drain
Carter, Loyd Frank	E. E.	Soph.	Portland
Carver, Fay	Com.	Soph.	Phoenix
Case, Austin M.	Chem. E.	Fr.	Klamath Falls
Castner, Frances Lillian	H. E.	Fr.	Hood River
Castle, Carrie Ethel	H. E.	Sr.	Berkeley, Calif.
Catton, Helen Lois	H. E.	Fr.	Portland
Catton, Mildred Wheeler	E. E.	Fr.	Portland
Caudle, Earl Cecil	Chem. E.	Fr.	Corvallis
Chadbourne, Estelle Wescott	H. E.	Jr.	San Francisco, Calif.
Chadbourne, Howard B.	Agri.	Fr.	San Francisco, Calif.
Chambers, Ralph Leveret Hugh	Agri.	Fr.	San Bernardino, Calif.
Chambers, Ruth Anna	H. E.	Fr.	Portland
Chandler, Annabel Carolyn	Phar.	Spec.	Corvallis
Chandler, Charlie	Agri.	Fr.	Fresno, Calif.
Chandler, Loyd Alden	M. E.	Fr.	La Grande
Chaney, Juanita Mae	H. E.	Fr.	Corvallis
Chapel, Franklin Gage	M. E.	Fr.	Portland
Chapman, Earl Hoyting	For.	Jr.	Rivera, Calif.
Chapman, Floyd L.	M. E.	Fr.	Wilbur
Chapman, Margaret L.	H. E.	Fr.	Sheridan
Chase, Elmo Barry	Agri.	Jr.	Eugene
Chase, Marion Lois	H. E.	Fr.	Corvallis
Chatfield, Mrs. M. F.	H. E.	Spec.	Albion, Mich.
Chellis, Lawrence True	I. A.	Sr.	Astoria
Chester, Alma Helen	Com.	Fr.	Boise, Idaho
Childs, Dorothy Ellen	H. E.	Jr.	Corvallis
Chipman, Merlin R.	Phar.	Soph.	Corvallis
Christine, Gertrude	H. E.	Spec.	Kenton
Christensen, Hazel	H. E.	Jr.	Portland
Christensen, Henry Noris	Agri.	Jr.	Portland
Christiansen, Lulu Marie	H. E.	Soph.	Chinook, Mont.
Church, Leighton F.	E. E.	Soph.	Grizzley Bluff, Calif.
Clark, Doris Aileen	H. E.	Sr.	Astoria
Clark, Kenneth Allen	Agri.	Fr.	La Grande
Clarke, Roscoe Wheeler	C. E.	Fr.	Salem
Clifford, Ida Arvilla	H. E.	Fr.	Portland
Clink, Russell T.	Agri.	Fr.	Modesto, Calif.
Clodfelter, Donald T.	M. E.	Spec.	Corvallis

Name	Course	Rank	Home Address
Cockrum, Arthur Bishoff	Com.	Fr.	Ontario
Coffman, Rupert Vern	Com.	Fr.	Cottage Grove
Cohill, Victoria	H. E.	Soph.	Portland
Cole, Harry Julius	Com.	Jr.	Emporia, Kan.
Cole, Maple Lucille	H. E.	Soph.	Canby
Coleman, Lloyd W.	Agri.	Sr.	Berkeley, Calif.
Coleman, Margaret Ruth	H. E.	Fr.	Moro
Coleman, Ralph Orval	Agri.	Sr.	Newport
Collins, Bertha Claire	Com.	Fr.	Corvallis
Collins, Burton Thane	Min.	Fr.	Corvallis
Collins, William Orville	M. E.	Fr.	Waterloo
Colpitts, Olive Percis	H. E.	Soph.	Trinidad, Colo.
Cone, Glyde E.	H. E.	Fr.	Corvallis
Conklin, Donald Vernon	Agri.	Soph.	Ontario
Conklin, Jean	Phar.	Fr.	Ontario
Conklin, Philip Arthur	M. E.	Soph.	Cove
Connell, Arthur Wood	Agri.	Jr.	Hillsboro
Cook, Kenneth	Agri.	Fr.	Portland
Cook, Margaret Farquhar	Com.	Spec.	Corvallis
Cooley, Myrtle	H. E.	Fr.	Smith River, Calif.
Cooley, Warren Robert	Phar.	Fr.	Harrisburg
Coop, Orion Virgil	Agri.	Fr.	Estacada
Cooper, Altha Opal	Com.	Jr.	Corvallis
Cooper, Helen E. A.	Opt.		Philadelphia, Pa.
Cooper, Howard Laraway	M. E.	Soph.	Hood River
Cooper, Howard Wesley	E. E.	Sr.	Milwaukie
Coovert, Elmo Claire	For.	Fr.	Portland
Coppock, Jessie	Com.	Spec.	Berlin
Cordelle, Howard Albert	E. E.	Soph.	Weiser, Idaho
Corey, Glen L.	E. E.	Sr.	Hood River
Corl, Miriam Elizabeth	H. E.	Soph.	Corvallis
Cornell, Carroll M.	M. E.	Spec.	Grants Pass
Cornog, Emma R.	Opt.		Oakfield, Wis.
Cornwall, Alice Ellen	H. E.	Jr.	Portland
Corrie, John Quincey	Agri.	Soph.	Corvallis
Corthell, Elden Sweet	Agri.	Soph.	Jacksonville
Corum, Curtis Lee	Chem. E.	Sr.	The Dalles
Cory, William M.	Agri.	Jr.	Etna Mills, Calif.
Coshow, Bertha Leone	H. E.	Soph.	Roseburg
Cottom, Kenneth Klock	Agri.	Soph.	Berea, Ohio
Cottingham, William	M. A.	Voc.	Parma, Idaho
Couch, Leo	Agri.	Sr.	Wallowa
Couch, Roy L.	Agri.	Sr.	Corvallis
Counts, Wilda	H. E.	Sr.	Grants Pass
Covell, Margaret	H. E.	Soph.	Corvallis
Covell, Walter	Agri.	Fr.	Corvallis
Cowan, Alvah G.	Agri.	Voc.	Tatoosh Island, Wash.
Cowley, Doris	Com.	Soph.	Central Point
Cox, Stephen	Chem. E.	Fr.	Ontario
Craig, Roland O.	Agri.	Fr.	La Habra, Calif.
Cramer, Floyd Samuel	M. E.	Jr.	Corvallis

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Name	Course	Rank	Home Address
Cramer, Rae Leah.....	Com.	Fr.	Corvallis
Cramer, Theo. P.....	Com.	Sr.	Grants Pass
Crandall, Grace Evelyn.....	H. E.	Fr.	Vancouver, Wash.
Crawford, Lillian Louise.....	Com.	Fr.	Nortons
Crawford, Malcom.....	Agri.	Fr.	Fresno, Calif.
Crawford, Vira June.....	Com.	Voc.	Reith
Creel, June.....	H. E.	Sr.	Reno, Nev.
Crittenden, Marjorie.....	H. E.	Jr.	Portland
Cross, Frances Carolyn.....	Com.	Fr.	Oregon City
Cross, Stella Marie.....	H. E.	Jr.	Oregon City
Crout, Mildred.....	H. E.	Sr.	Portland
Crowell, Chester E.....	Min.	Soph.	Takilma
Crow, John William.....	Agri.	Voc.	Pendleton
Culbertson, Elijah Lee.....	Agri.	Voc.	Gravel Ford
Cummings, Herchel M.....	Phar.	Jr.	Melba, Idaho
Cunning, Mamie.....	H. E.	Fr.	Baker
Cunningham, Bessie Alta.....	Com.	Spec.	San Jose, Calif.
Currey, Herschel Eugene.....	Phar.	Spec.	Baker
Curry, Fred Martin.....	Phar.	Sr.	Albany
Curtis, Irene.....	H. E.	Soph.	Salem
Cyrus, William Fletcher.....	Agri.	Spec.	Corvallis
Dadmun, Orin D.....	Hi. E.	Jr.	Independence
Dallas, Earl Wesley.....	Agri.	Soph.	Corvallis
Dallas, Mabel Tableaux.....	H. E.	Soph.	Corvallis
Daniel, Clarence McClellan.....	For.	Jr.	Monmouth
Daniel, Maple.....	Com.	Spec.	Alsea
Daniel, Margaret.....	H. E.	Fr.	Bananza
Daniel, Margaret B.....	Com.	Spec.	Alsea
Daniels, William Chris.....	Agri.	Spec.	Hoquiam, Wash.
Darland, Zetta Ivy.....	H. E.	Spec.	Tulsa, Okla.
Darby, Una.....	H. E.	Jr.	Silverton
Davidson, Argus Harold.....	Agri.	Sr.	Meridian, Idaho
Davis, Bertha Marian.....	H. E.	Soph.	Marshfield
Davis, Lois Grace.....	H. E.	Soph.	Myrtle Creek
Davolt, Bertha Eunice.....	H. E.	Fr.	Kelso, Wash.
Dawson, Esther Elva.....	Opt.		Corvallis
Day, Loetta.....			
Dean, Eunice Pern.....	H. E.	Voc.	Ferndale, Calif.
Deckebach, Fred Carl.....	Chem. E.	Spec.	Salem
De France, Irving Alfred.....	C. E.	Fr.	Corvallis
De Lay, Imo Laura.....	H. E.	Fr.	Portland
Denlinger, Wendell H.....	Chem. E.	Fr.	Maplewood
Denney, Margaret Dearle.....	H. E.	Voc.	Beaverton
Dent, Milton A.....	M. E.	Fr.	Amity
Dentler, John A. E.....	E. E.	Fr.	Portland
Detering, William.....	Min.	Jr.	Portland
Dezendorf, Nelson C.....	Chem. E.	Soph.	Portland
Dick, Bertram Gail.....	M. A.	Voc.	Albee
Dick, Carolyn Frances.....	H. E.	Soph.	Portland
Dillard, Wilma Lucy.....	H. E.	Soph.	Mills City, Mont.
Ding, Albert Poy.....	For.	Soph.	Portland

Name	Course	Rank	Home Address
Ding, Edward Ralph.....	Agri.	Jr.	Portland
Ding, Frank Gow.....	E. E.	Jr.	Portland
Dinger, Viola Ruth.....	H. E.	Fr.	Sublett, Idaho
Dinwiddie, Eula.....	Com.	Voc.	Corvallis
Dinwiddie, Verne McKinley.....	Phar.	Spec.	Corvallis
Dixon, Ned E.....	Com.	Fr.	Drain
Doak, Olive Melvyna.....	H. E.	Fr.	McMinnville
Dobell, Lila Grace.....	Com.	Spec.	Corvallis
Donovan, Christopher Richard.....	Agri.	Spec.	Dublin, Ireland
Donnell, Merrill Martin.....	Phar.	Soph.	The Dalles
Doolittle, George Barnett.....	Min.	Jr.	Corvallis
Dorn, Lois.....	H. E.	Soph.	Pasadena, Calif.
Dougherty, Helen Frances.....	H. E.	Sr.	Baker
Douglas, Alfred Earl.....	Phar.	Jr.	Corvallis
Douglas, Elizabeth Ruth.....	H. E.	Jr.	Marshfield
Douglas, Olin Eugene.....	Phar.	Sr.	Corvallis
Downs, Ada Adelaide.....	H. E.	Fr.	Drain
Draper, Dale D.....	Agri.	Fr.	West Linn
Dunn, Burton Wm.....	Agri.	Fr.	Kimberly, Idaho
Dunn, Mary Matilda.....	H. E.	Jr.	Kimberly, Idaho
Dunn, Paul E.....	M. E.	Fr.	Ontario
Dunn, Rufus Earl.....	Agri.	Spec.	Meda
Dunning, Eva M.....	H. E.	Jr.	Stanfield
Dunning, Marilla C.....	H. E.	Jr.	Stanfield
DuPuy, Fred K.....	M. E.	Soph.	Portland
Du Rette, Louisa Merle.....	H. E.	Fr.	Gervais
Durham, Lee L. M.....	Agri.	Soph.	Hemet, Calif.
Dutton, Geo. Lawrence.....	Com.	Jr.	Concordia, Kan.
Dye, C. Evangeline.....	H. E.	Jr.	Oregon City
Dye, Everett Willoughby.....	M. E.	Sr.	Oregon City
Dyskow, Margaret Marjorie.....	Com.	Spec.	Centralia, Wash.
Dykes, Thelma.....	H. E.	Soph.	Corvallis
Dyson, Lizzie.....	H. E.	Sr.	Dahlia, Wash.
Eakin, John B.....	Agri.	Jr.	Dallas
Eakins, Jack M.....	Agri.	Sr.	South Pasadena, Calif.
East, Gertrude Dorothy.....	H. E.	Soph.	Salem
Eaton, Frances.....	H. E.	Jr.	Portland
Eddy, Arthur Abbott.....	For.	Voc.	Langlois
Edwards, Dorothy Margaret.....	H. E.	Fr.	Monroe
Edwards, Lewis Herman.....	Min.	Jr.	Bellfountain
Eikelman, John Albert.....	Agri.	Soph.	San Bernardino, Calif.
Eilertson, John E.....	Log. E.	Soph.	Clatskanie
Eilertson, William T.....	Agri.	Soph.	Clatskanie
Eldridge, Elizabeth Adelaide.....	H. E.	Soph.	Tacoma, Wash.
Elkins, Helen Oaks.....	Com.	Soph.	Prineville
Ellestad, Melvin Herman.....	I. A.	Sr.	Central Point
Elliott, Dorcas May.....	H. E.	Jr.	Vancouver, Wash.
Elmer, Edna Elmira.....	H. E.	Spec.	Mulino
Elofson, Harry W.....	For.	Sr.	Salida, Colo.
Emery, Burdette.....	Agri.	Soph.	Portland
English, Felix A.....	Hi. E.	Soph.	Salem

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
English, Pennoyer F.....	Agri.	Jr.	Salem
Englund, Eric.....	Agri.	Sr.	Portland
Entermille, Fred D.....	Agri.	Jr.	Baker
Ericson, Mrs. Lars John.....	H. E.	Jr.	Corvallis
Ericson, Lars John.....	I. A.	Sr.	Corvallis
Eriksen, Norma Elizabeth.....	H. E.	Soph.	Orland, Calif.
Ernst, Daisy Linden.....	H. E.	Fr.	Claremont, Calif.
Everett, Verne Frazier.....	Agri.	Soph.	Portland
Ewell, Aldwyth Elaine.....	H. E.	Soph.	Portland
Eyre, Rowena Pearl.....	H. E.	Spec.	Salem
Famme, Milile Mae.....	H. E.	Fr.	Forest Grove
Fargher, Walter Melchoir.....	Com.	Voc.	Dufur
Farrell, Miller Starr.....	E. E.	Fr.	Portland
Feike, Zelta Fern.....	H. E.	Jr.	Portland
Felker, Maybelle Edna.....	H. E.	Fr.	Portland
Fenner, Reuben Everett.....	Agri.	Sr.	Sumner, Wash.
Ferguson, Homer W.....	M. E.	Sr.	Portland
Ferguson, Natalie.....	H. E.	Fr.	Helix
Finney, Edward Axel.....	Agri.	Fr.	Astoria
Finney, John L.....	Agri.	Sr.	Astoria
Firestone, Chester La Vene.....	Agri.	Sr.	Vancouver, Wash.
Firestone, Norma Ellen.....	H. E.	Fr.	Vancouver, Wash.
Fischer, Ardis Loraine.....	H. E.	Voc.	Corvallis
Fischer, George.....	E. E.	Fr.	Klamath Falls
Fischer, Robert.....	Min.	Fr.	Klamath Falls
Fischer, Bertha Marie.....	H. E.	Jr.	Haines
Fisher, Elmer.....	Min.	Jr.	Orchards, Wash.
Fisher, Glenn E.....	Agri.	Fr.	Haines
Flegal, Kate Susannah.....	H. E.	Jr.	Eugene
Fletcher, Rita Belle.....	H. E.	Soph.	Corvallis
Fluharty, Arthur Lawrence.....	Agri.	Soph.	Clarkston, Wash.
Foell, Harold F.....	Agri.	Soph.	Los Angeles, Calif.
Fogal, Jay Rhubert.....	Agri.	Voc.	Kanorado, Kan.
Foley, James Owen.....	Phar.	Jr.	Corvallis
Foraker, Miriam.....	Opt.		Corvallis
Forbis, Ernest Stuart.....	M. A.	Spec.	Myrtle Creek
Ford, Hugh Pillsbury.....	M. E.	Sr.	Eugene
Ford, Kenneth.....	Agri.	Soph.	Union
Ford, Neal Kelly.....	M. E.	Sr.	Eugene
Forest, Bernice.....	H. E.	Sr.	Eugene
Forrey, Ira Huber.....	Agri.	Soph.	Pasadena, Calif.
Fortner, Philip Tuthill.....	Agri.	Spec.	Chicago, Ill.
Foster, William Harry.....	M. E.	Fr.	Portland
Fox, Charles A.....	M. E.	Fr.	Portland
Fraley, Laurence King.....	For.	Soph.	Portland
Frame, Dana Selby.....	Agri.	Jr.	Talent
Frazier, M. Ethel.....	Com.	Fr.	Salem
Freeland, Eugene Louis.....	Chem. E.	Jr.	Shedds
Freeman, Leonard Jay.....	Agri.	Soph.	Central Point
Freeman, Lola.....	H. E.	Soph.	Central Point
Freeman, Merritt.....	M. A.	Voc.	Sublimity

Name	Course	Rank	Home Address
Freeman, Vernon Neale	Com.	Fr.	Moro
Freydig, Marguerite	Com.	Fr.	Sutherlin
Freyler, Edna May	H. E.	Sr.	Corvallis
Freidenthal, Adolph Louis	Agri.	Jr.	Portland
Fryer, Claude Henry	M. E.	Fr.	Portland
Fudge, Laurence	E. E.	Jr.	Ballston
Fugh, Paul Chen	For.	Jr.	Washington, D. C.
Fulton, Helen Louise	H. E.	Soph.	Corvallis
Funk, Luther Lawrence	C. E.	Fr.	Sheridan
Funk, Vera Magdalene	H. E.	Soph.	Corvallis
Futtrup, Ellen Marie	Com.	Spec.	Vancouver, Wash.
Gabel, Ruth	H. E.	Fr.	Chehalis, Wash.
Gain, Mertie Jane	Com.	Spec.	Birch Run, Mich.
Gaither, James Terrence	Com.	Fr.	Toledo
Garber, Hazel	H. E.	Jr.	Nampa, Idaho
Gardner, Esther Marie	Com.	Fr.	Portland
Gardner, Frances Harth	Com.	Voc.	Portland
Gardner, Helen Corinne	H. E.	Soph.	Portland
Gardner, Mary Frances	Com.	Fr.	Portland
Gardner, Vesta Hazel	H. E.	Jr.	Salem
Garman, J. C.	E. E.	Fr.	Portland
Garnjobst, Laura Florian	Phar.	Fr.	Salem
Garnjobst, Martha Emma	H. E.	Spec.	Salem
Garst, Clyde	Agri.	Fr.	Dayton, Ohio
Garvin, Pearl Ethelyn	Com.	Fr.	Corvallis
Gavin, Nancy	Agri.	Fr.	Portland
Gay, Ruth Leah	Com.	Soph.	Corvallis
George, Howard S.	Com.	Soph.	Lewiston, Idaho
George, Marian Charlotte	Com.	Soph.	Lewiston, Idaho
Gibbons, James Lane	Agri.	Fr.	Corvallis
Gibbs, Roy Harry	I. A.	Soph.	Gresham
Gibson, Elsie M.	H. E.	Jr.	Nyssa
Gibson, Clair John	M. E.	Spec.	Nyssa
Giddings, Paul C.	M. E.	Fr.	Albany
Gilbert, Lovina	H. E.	Fr.	Tacoma, Wash.
Gilfillan, Dorothy Elvan	Com.	Fr.	Albany
Gilfillan, Hobart Ralph	M. E.	Soph.	Albany
Glaser, John	Agri.	Spec.	Lebanon
Gleeson, Fred Kane	Agri.	Voc.	Mitchell, S. D.
Glennon, Fenton James	Com.	Fr.	Portland
Glines, Emma Ione	H. E.	Sr.	Waldport
Glines, Hallie Winifred	H. E.	Sr.	Waldport
Gloman, Joseph S.	Agri.	Jr.	Bellingham, Wash.
Godel, Howard F.	Agri.	Sr.	Portland
Goheen, Mary Euella	Opt.		Sherwood, N. D.
Gordon, Charles A.	Agri.	Fr.	Pendleton
Gould, Lois Helen	Com.	Fr.	Corvallis
Grafton, Jack H.	Agri.	Soph.	Chehalis, Wash.
Granrud, Harold H.	Chem. E.	Fr.	Tacoma, Wash.
Grant, Mildred Harriett	H. E.	Fr.	Portland
Graves, Leaman Lee	Agri.	Sr.	Corvallis

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Gray, Zola Love.....	H. E.	Spec.	Springfield
Gregg, Loyd B.....	Com.	Fr.	Salem
Gregg, Rodney.....	M. E.	Jr.	Gazelle, Calif.
Gregson, Agnes.....	H. E.	Soph.	Salem
Green, Ellsworth Nelson.....	Min.	Soph.	La Verne, Calif.
Green, Katharyn Boyce.....	H. E.	Soph.	Berkeley, Calif.
Green, Marshall Byron.....	Min.	Soph.	La Verne, Calif.
Green, Max.....	I. E.	Fr.	Alturas, Calif.
Greer, Medric M.....	Agri.	Sr.	Dundee
Gribskov, Maren.....	H. E.	Sr.	Junction City
Grimm, Frank Lawrence.....	Opt.		Onalaska, Wash.
Grow, Homer Wallace.....	Agri.	Sr.	Corvallis
Groves, Roshel Meryl.....	Agri.	Soph.	Lebanon
Grubb, Hollis.....	E. E.	Fr.	Halfway
Gruening, Helen Elizabeth.....	Phar.	Fr.	Corvallis
Guest, Lillian V.....	Opt.		Portland
Gunn, Henry Martin.....	Agri.	Soph.	Hermiston
Gurley, Wayne E.....	E. E.	Sr.	Twin Falls
Guthrie, Eunice Jane.....	H. E.	Jr.	Corvallis
Guthrie, Leroy Roland.....	M. E.	Sr.	Corvallis
Haberer, Erwin Sam.....	For.	Jr.	Chicago, Ill.
Hackett, Joe F.....	Com.	Soph.	Corvallis
Hacking, Margaret May.....	Com.	Fr.	Corvallis
Hadley, Winnifred Edith.....	Opt.		Albany
Haffey, George.....	Com.	Voc.	Cape Horn, Wash.
Haines, Bernice Mae.....	H. E.	Fr.	Portland
Haley, Helen.....	H. E.	Jr.	Chicago, Ill.
Haley, Susan B.....	Com.	Fr.	Chicago, Ill.
Hall, Coral Clarice.....	H. E.	Spec.	Jerome, Idaho.
Hall, George Jay.....	Agri.	Soph.	Cottage Grove
Hall, Kenneth B.....	E. E.	Fr.	Pocatello, Idaho
Hall, Phila Henrietta.....	H. E.	Sr.	Fairfax, Vt.
Hall, Thorland R.....	Agri.	Soph.	Yakima, Wash.
Hamm, Winona Gertrude.....	Com.	Spec.	Corvallis
Hamman, Mabel.....	Opt.		Manzanola, Colo.
Hammond, Edmund P.....	M. E.	Jr.	Portland
Hammond, Josephine M.....	H. E.	Sr.	Silverton
Hammond, Louise Kerr.....	H. E.	Fr.	Hubbard, Ohio
Hampton, Eugene.....	Agri.	Fr.	Pendleton
Hanks, Harold F.....	E. E.	Fr.	Portland
Hanna, Wayne.....	Agri.	Fr.	Independence
Happold, Louie.....	E. E.	Sr.	Klondike
Harbke, Helen Mabe.....	Com.	Fr.	Portland
Hardie, Marjory.....	Com.	Spec.	Condon
Hargrove, Vivian.....	Com.	Soph.	Salem
Harnett, Francis B.....	Agri.	Soph.	Long Beach, Calif.
Harnish, Hedwig Hazel.....	Com.	Fr.	Gravel Ford
Harrington, Helen.....	H. E.	Jr.	Salem
Harrington, Ossie.....	H. E.	Voc.	Jacksonville

Name	Course	Rank	Home Address
Harris, Herbert V.....	E. E.	Soph.	Oregon City
Harris, Russell L.....	Min.	Fr.	Central Point
Harris, Wilda C.....	Com.	Voc.	Marshfield
Hart, Corintha Eleanor.....	Com.	Fr.	Albany
Hart, Glenn Ray.....	I. A.	Spec.	North Bend
Hart, Opal Frances.....	H. E.	Soph.	Cottage Grove
Harter, Arvilda Platte.....	Agri.	Jr.	Hatton, Wash.
Hartmann, Charles Harold.....	Agri.	Soph.	Holister, Calif.
Hartley, Chas. A.....	Agri.	Fr.	San Bernardino, Calif.
Hartley, Edwin A.....	Agri.	Sr.	Marshfield
Harvey, Andrew F.....	Agri.	Fr.	Pendleton
Harvey, Eudora Mae.....	H. E.	Fr.	Corvallis
Harvey, Joseph Paul.....	Chem. E.	Soph.	Portland
Harvey, Nora.....	H. E.	Soph.	Pendleton
Haseltine, Frances Gordon.....	H. E.	Voc.	Portland
Hastings, Martha Marie.....	Com.	Soph.	Springfield
Hatch, Horace Clinton.....	M. E.	Fr.	Oakland
Hatfield, Clifford Olcott.....	Phar.	Fr.	Central Point
Hatfield, John E.....	Com.	Soph.	Dixonville
Hathaway, Otto E.....	Com.	Fr.	Corvallis
Hathaway, Lois Reta.....	H. E.	Jr.	Corvallis
Hattan, Elton.....	Min.	Jr.	Oregon City
Hauge, Osmond Johann.....	Agri.	Fr.	Woodburn
Hawley, Francell.....	H. E.	Soph.	McCoy
Hay, William C.....	Phar.	Soph.	Lihae, Hawaii
Hayes, William Brewster.....	Agri.	Fr.	Pasadena, Calif.
Hayslip, Earle E.....	Log. E.	Jr.	Vancouver, Wash.
Hazen, Winifred.....	H. E.	Fr.	Snohomish, Wash.
Hearing, Leo.....	Agri.	Fr.	Haines
Heath, Eva Myrtle.....	Com.	Spec.	Newcastle Bridge, New Brunswick
Hedlund, Clara.....	H. E.	Fr.	Portland
Hedlund, Lillian Hancock.....	Opt.		Dallas, Texas
Heider, Lorena.....	H. E.	Jr.	Sheridan
Heinze, Anna Harriet.....	H. E.	Soph.	Portland
Heine, Mildred.....	Com.	Soph.	Medford
Helm, Genevieve M.....	H. E.	Voc.	Agness
Helm, Myrtle Edna.....	Com.		North Bend
Henderson, George.....	Com.	Soph.	Barstow, Calif.
Henderson, Winfield Lester.....	Agri.	Soph.	Portland
Henricks, John Joseph.....	Agri.	Soph.	Florence
Hendricks, Ida Belle.....	H. E.	Fr.	Woodburn
Hendrickson, Martin.....	Chem. E.	Fr.	Orland, Calif.
Henry, Mildred.....	Com.	Fr.	Roseburg
Henry, William Bryan.....	Com.	Fr.	Jerome, Idaho
Henshaw, Fred Merritt.....	E. E.	Soph.	Portland
Hershey, Hazel Mildred.....	Phar.	Fr.	Portland
Hesseltine, Earl Handley.....	Agri.	Soph.	Tulare, Calif.
Hettinger, Harry Howard.....	Agri.	Soph.	Portland
Hewitt, Harry Nutting.....	Phar.	Soph.	Red Oak, Iowa
Hewett, Melford Grant.....	E. E.	Soph.	Hubbard

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Hicks, Hazel Ione.....	H. E.	Soph.	Wieser, Idaho.
Hildreth, Franklin M.....	E. E.	Spec.	Bridgehampton, N. Y.
Hill, Alfred.....	M. E.	Fr.	Wilbur
Hines, Loyd L.....	I. A.	Voc.	Wasco
Hobart, Alvin Dewey.....	For.	Fr.	Silverton
Hoefler, Myron Page.....	Com.	Voc.	Astoria
Hodgson, Marion.....	H. E.	Sr.	Ashland
Hofmann, Chauncey Wm.....	For.	Fr.	Portland
Hogg, John Glenn.....	Agri.	Fr.	Salem
Hogshire, Joann.....	H. E.	Fr.	Portland
Holden, John W.....	Com.	Fr.	Portland
Holden, Jesse L.....	M. E.	Jr.	Portland
Holder, Chas.....	Com.	Voc.	Portland
Holgate, Laura C.....	Opt.		Corvallis
Holker, T. Booth.....	Agri.	Jr.	Toston, Mont.
Hollenberg, Leo D.....	Agri.	Sr.	Corvallis
Hollingsworth, Esther.....	Com.	Fr.	Newberg
Holmes, David Whittaker.....	Com.	Soph.	Almy, Wyo.
Holmes, Florence.....	Agri.	Soph.	Portland
Holmes, Horace H.....	Agri.	Fr.	North Bend
Holmes, H. P.....	Min.	Soph.	Corvallis
Holmes, Joseph Folger.....	For.	Soph.	Oakland, Calif.
Holmes, Lee Stanley.....	For.	Fr.	Portland
Holmes, Mary Vincent.....	Com.	Fr.	Portland
Holmes, Mildred M.....	Com.	Spec.	Corvallis
Holmes, Paul F.....	Agri.	Sr.	Los Angeles, Calif.
Holroyd, Imojean.....	H. E.	Soph.	Corvallis
Hooton, Arthur L.....	E. E.	Fr.	Coquille
Hoover, Bessie Ellen.....	H. E.	Fr.	Albany
Hope, George Milton.....	M. A.	Voc.	Vale
Hopson, Eric Ernest.....	Min.	Fr.	Portland
Horner, Clyde Dale.....	Phar.	Jr.	Corvallis
Horning, Gladys Louise.....	H. E.	Soph.	Corvallis
Horning, Martha Alberta.....	Com.	Fr.	Corvallis
Houck, Agnes Catherine.....	H. E.	Jr.	Portland
Houck, John Edwin.....	Com.	Fr.	Portland
Howard, Dale.....	Agri.	Jr.	Astoria
Howell, Mary Naomi.....	H. E.	Spec.	Corvallis
Howells, Katherine.....	H. E.	Sr.	Medford
Howey, Hazel Dell.....	Com.	Soph.	Corvallis
Howey, Olive Mary.....	H. E.	Soph.	Corvallis
Howser, May Zetta.....	H. E.	Fr.	Corvallis
Hoxsie, Ernest P.....	Agri.	Fr.	Folsom, Calif.
Hubbard, Clarissa S.....	H. E.	Soph.	Junction City
Hubbard, Clyde W.....	M. E.	Spec.	Weiser, Idaho
Hubbard, Eugene Field.....	Agri.	Fr.	Corvallis
Hubbard, Ina Mary.....	Phar.	Fr.	Rickreall
Hubbard, Verda.....	H. E.	Jr.	Rickreall
Huey, Olen Leroy.....	Agri.	Fr.	Pendleton
Huffaker, Neal.....	M. E.	Fr.	Idaho Falls, Idaho
Hughes, Robert Emmett.....	Phar.	Fr.	Heppner

Name	Course	Rank	Home Address
Hukari, Helia.....	Com.	Fr.	Hood River
Humfield, Harry.....	Agri.	Soph.	Portland
Hung, Tung Ming.....	Agri.	Sr.	Amoy, China
Hunt, John M.....	Agri.	Spec.	Westport
Hunter, Bernice.....	Com.	Fr.	Corvallis
Hunter, Elmer Dean.....	Agri.	Jr.	Portland
Hunter, Florence Lulu.....	Com.	Spec.	Albany
Hunter, Gilbert William.....	Agri.	Soph.	Island City
Hurd, Florence.....	H. E.	Jr.	Medford
Hurner, Frank Joe.....	E. E.	Soph.	Monmouth
Hurst, Genevieve.....	H. E.	Spec.	Portland
Husbands, Emily Rozella.....	H. E.	Fr.	Mosier
Husbands, Esther.....	H. E.	Sr.	Hood River
Husbands, Myrtle.....	Com.	Jr.	Hood River
Hutchings, E. Albert.....	Min.	Jr.	Brownsville
Hutchinson, Frank Cochrane.....	For.	Soph.	Salt Lake City, Utah
Hutchinson, Howard Boles.....	E. E.	Fr.	Portland
Hutchins, Gladys Georgene.....	H. E.	Soph.	Portland
Hyde, James B.....	Min.	Soph.	Portland
Hyde, Sara Esther.....	Opt.		Corvallis
Hymes, Walter L.....	M. E.	Fr.	Summit
Inman, Weslie Oliver.....	M. E.	Soph.	Vader, Wash.
Ireland, David Kenneth.....	Chem. E.	Fr.	Bellingham, Wash.
Ireland, Edith.....	H. E.	Soph.	Portland
Ireland, Orlive Le Roy.....	Phar.	Soph.	Portland
Irving, Ralph E.....	Agri.	Jr.	Harney
Irwin, Princess Lauretta.....	Com.	Spec.	Corvallis
Isherwood, Samuel Harold.....	I. A.	Spec.	Corvallis
Jack, Jeanette W.....	Com.	Fr.	Pendleton
Jackman, Oral Eva.....	H. E.	Fr.	Lynden, Wash.
Jacobson, Roma.....	Com.	Fr.	La Grande
Jacoby, Fred.....	Agri.	Sr.	Portland
Jaskson, Helen P.....	Com.	Fr.	Portland
Jasper, Merrell Clair.....	Min.	Fr.	Baker
Jenkins, Doris Mildred.....	H. E.	Fr.	Portland
Jenkins, John Donald.....	Chem. E.	Soph.	Portland
Jenks, Marylee.....	H. E.	For.	Tangent
Jepperson, John.....	Agri.	Spec.	Bacona
Jernstedt, Leonard R.....	Agri.	Soph.	Carlton
Jessen, Ralph Frank.....	Agri.	Soph.	Piedmont, Calif.
Jessup, Geoge LeRoy.....	Agri.	Jr.	Portland
Jetley, Arthur C. L.....	C. E.	Sr.	Crane
Jewel, Herbet H.....	Com.	Sr.	Portland
Jewel, Paul W.....	Phar.	Soph.	Corvallis
Jewell, Robert L.....	Min.	Fr.	Grants Pass
John, S. Helen.....	H. E.	Soph.	Corvallis
Johnson, Chris Edward.....	Phar.	Sr.	North Powder
Johnson, Edlie Marjorie.....	H. E.	Soph.	Hermiston
Johnson, Ellen Otten.....	H. E.	Fr.	Portland
Johnson, Gladys Viola.....	H. E.	Fr.	Scappoose
Johnson, John Iver.....	Agri.	Jr.	Winlock, Wash.

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Name	Course	Rank	Home Address
Johnson, Loren Albert.....	Agri.	Soph.	Scappoose
Johnson, Robert H.....	Agri.	Fr.	Redmond
Johnson, Willard.....	For.	Sr.	Corvallis
Johnston, Charles M.....	For.	Soph.	Portland
Johnston, Clarence Edwin.....	L. E.	Soph.	Portland
Johnston, Lyle.....	E. E.	Fr.	Klamath Falls
Johnston, Marie Elizabeth.....	Com.	Voc.	Portland
Jones, Charlotte Louise.....	Com.	Soph.	La Grande
Jones, Edward Dee.....	M. E.	Soph.	Corvallis
Jones, Frieda Buryle.....	Com.	Fr.	Corvallis
Jones, Genevieve M.....	Com.	Fr.	Oregon City
Jones, Margaret Frances.....	H. E.	Fr.	Corvallis
Jones, Paul Frank.....	E. E.	Fr.	Eugene
Jones, Ronald Ewart.....	Agri.	Sr.	Brooks
Jones, William Conrad.....	Agri.	Soph.	Ottowa, Kan.
Jory, Elmo C.....	Phar.	Sr.	Salem
Josephson, Ethel Margaret.....	Com.	Fr.	Marshfield
Jower, Henry.....	M. E.	Fr.	Portland
Justo, Robert Nolasco.....	Agri.	Jr.	Buenos Aires, Argentine
Kaegi, Maye F.....	Opt.		Wilbur
Kaegi, Morrice C.....	Phar.	Soph.	Wilbur
Kasberger, Joseph.....	Agri.	Fr.	The Dalles
Keatley, Robert Leland.....	Agri.	Fr.	Castle Rock, Wash.
Keck, Rufus C.....	Agri.	Jr.	Pattstown, Pa.
Keil, Wilhelm Frederick.....	Agri.	Fr.	Cosmopolis, Wash.
Keller, Eugene John.....	Agri.	Soph.	Astoria
Keller, Leota Iola.....	H. E.	Voc.	Ashland
Kellogg, Chandler.....	Com.	Fr.	Los Angeles, Calif.
Kellogg, Ralph Lester.....	C. E.	Jr.	Portland
Kelly, Eva.....	H. E.	Soph.	Corvallis
Kelly, Jean M.....	Agri.	Soph.	Corvallis
Kelly, Ruth.....	H. E.	Sr.	Corvallis
Kelsey, Hazel.....	H. E.	Soph.	Columbia City, Ind.
Kempin, Flora.....	H. E.	Spec.	Corning, Kan.
Kennedy, David Honore.....	Agri.	Soph.	Portland
Kennedy, Ruth Henrietta.....	H. E.	Jr.	Corvallis
Kenny, Dora Lotella.....	H. E.	Jr.	Portland
Kenyon, Alfred William.....	Agri.	Fr.	Salem
Kephart, Olga Ahlson.....	H. E.	Spec.	Hillsdale
Keppinger, Verne M.....	H. E.	Jr.	Gervais
Kern, Dorothy Alma.....	H. E.	Fr.	Washougal, Wash.
Kerr, Genieve.....	H. E.	Soph.	Corvallis
Kiddle, Lyle Blair.....	Com.	Sr.	Island City
Kies, Gladys Ruth.....	H. E.	Fr.	Vancouver, Wash.
Kincaid, William Brayton.....	Agri.	Fr.	Portland
King, Florence Kathleen.....	Com.	Fr.	Corvallis
King, Philip S.....	Agri.	Sr.	Portland
King, Rudolph Jack.....	Agri.	Jr.	Grand Rapids, Mich.
Kingsley, Everette Ellenor.....	H. E.	Jr.	Hermiston
Kinzey, Robert T.....	Com.	Jr.	Prairie City
Kirchenschlager, Delbert.....	Agri.	Fr.	Monrovia, Cal.

Name	Course	Rank	Home Address
Kirk, Arthur A.	E. E.	Fr.	Freewater
Kirkland, Robin Watson	Agri.	Voc.	Westham Island, B. C.
Kistner, Vernice Anna	H. E.	Fr.	Ontario, Calif.
Klages, Karl W. H.	Agri.	Fr.	Corvallis
Kleinau, Carl Samuel	M. E.	Fr.	Jerome, Idaho
Klingeale, Louie P.	E. E.	Fr.	Salem
Knapp, Veva Ella	H. E.	Fr.	Camas, Wash.
Knight, Maurice R.	Agri.	Soph.	Santa Ana, Calif.
Knips, Avis Irma	H. E.	Fr.	Grants Pass
Knoll, Lillian Sikes	H. E.	Spec.	Corvallis
Knoll, Paul X.	For.	Spec.	Denton, Mont.
Knowles, Inez N.	H. E.	Sr.	La Grande
Knox, Theron Edwin	Com.	Fr.	John Day
Kocken, Walter J.	Hort.	Sr.	Cleveland
Koerber, Dorothea M.	Com.	Fr.	Portland
Kooreman, Milton A.	M. E.	Jr.	Salem
Koller, Frank A.	For.	Soph.	Astoria
Kramien, Lionel C.	Phar.	Soph.	Newberg
Kreamer, Madeline	H. E.	Fr.	Independence
Krueger, Clarence W.	E. E.	Sr.	Corvallis
Krueger, Hans Luie	E. E.	Fr.	Corvallis
Kuklin, June May	H. E.	Jr.	Salem
Kung, Shih Lung	Agri.	Fr.	Kiangsi, China
Kurtz, Martin	Com.	Sr.	Corvallis
Kyle, Elmer E.	Agri.	Fr.	Central Point
Kyle, Hugh Wallace	L. E.	Fr.	Portland
Kyle, Kittie Gertrude	H. E.	Sr.	Corvallis
Kyle, Robert Floyd	Com.	Soph.	Central Point
Lafky, Herman Ernest	Agri.	Jr.	Corvallis
Lagus, Sigurd W.	Min.	Jr.	Astoria
Lahti, Edward Andrew	Phar.	Spec.	Astoria
Laing, Mabel Elsie	Phar.	Jr.	Eugene
Lamar, Howard Loring	Phar.	Soph.	Tillamook
Landess, Dorothy	H. E.	Fr.	Dayton
Landram, Telete	H. E.	Jr.	Merced, Calif.
Lane, Dorothy Elizabeth	H. E.	Sr.	Hollywood, Calif.
Langley, Ethel Mary	Com.	Fr.	Portland
Lankeneau, Walter Henry	For.	Sr.	New York, N. Y.
Lankins, Hazel Claire	H. E.	Sr.	Hubbard
Larsen, Edwin E.	M. E.	Fr.	Suver
Larsen, Lillie L.	H. E.	Fr.	Laurel
Larson, Clarence Elmer	Agri.	Soph.	Long Beach, Calif.
Larson, Raymond Gilbert	Agri.	Jr.	Fairfield, Iowa
Lascar, Adhar Chandra	E. E.	Sr.	Calcutta, India
Lathim, Kenley Brownhill	Com.	Spec.	The Dalles
Lathrop, Willis F.	E. E.	Soph.	Portland
Law, Turah Anna	H. E.	Fr.	Corvallis
Layton, Clorin J.	M. E.	Fr.	Rathdrum, Idaho
Layton, Helen	Com.	Soph.	Grants Pass
Leech, Archer Olin	M. E.	Sr.	Corvallis
Legg, Gladys Loretta	H. E.	Sr.	Portland

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Lemmon, Oral Miskell.....	Phar.	Soph.	Salem
Lenox, Gladys.....	H. E.	Soph.	Klamath Falls
Le Peau, Nathaniel X.....	Hi. E.	Soph.	Canton, Ohio
Lesh, Laurence Y.....	Com.	Fr.	Corvallis
Lewis, Garfield Orr.....	Agri.	Soph.	Portland
Lewis, John Mitchell.....	Agri.	Sr.	Corvallis
Lewis, Louise.....	Com.	Sr.	Portland
Lewis, Mary Adele.....	H. E.	Fr.	Corvallis
Lewis, Ronald Edward.....	Com.	Fr.	McMinnville
Lewis, Willard.....	Agri.	Fr.	Lostine
Liddell, John W.....	Agri.	Fr.	Oakland, Calif.
Lienkaemper, Gertrude.....	H. E.	Fr.	Portland
Lindsay, Annie McDonald.....	H. E.	Sr.	Corvallis
Lindsay, Edith McOnie.....	H. E.	Soph.	Corvallis
Lindsay, Velda B.....	Agri.	Fr.	Salem
Linville, Myrtle Harriet.....	H. E.	Jr.	Astoria
Lister, Violet.....	Com.	Fr.	Paulina
Littler, Florence Elizabeth.....	H. E.	Sr.	Forest Grove
Livengood, Kathrine Gene.....	Opt.		Albany
Livengood, Ruth Eleanor.....	Com.	Fr.	Albany
Livery, Anne.....	Com.	Soph.	Liberty, Neb.
Lockley, Lawrence C.....	Com.	Fr.	Portland
Lodell, Carl A.....	Com.	Soph.	Portland
Loennig, Franklin Lang.....	Agri.	Fr.	Haines
Logan, Carlton Kneelan.....	Com.	Jr.	Albany
Long, Carl Douglas.....	Com.	Soph.	Oakland
Long, Ethel D.....	Com.	Soph.	Caldwell, Idaho
Longwell, Earl Harry.....	Agri.	Fr.	Hawthorne, Calif.
Loop, Charles R.....	Agri.	Jr.	McMinnville
Loosley, Merle John.....	Agri.	Soph.	Fort Klamath
Lorence, Jennings Bryan.....	M. E.	Sr.	Monmouth
Loughary, Elithe.....	H. E.	Sr.	Monmouth
Love, Annis.....	H. E.	Sr.	Junction City
Lowe, Alexander Robertson.....	Min.	Fr.	Seattle, Wash.
Lowe, Thomas Julian.....	Agri.	Jr.	Nyssa
Lowry, Edith Mae.....	H. E.	Soph.	Bellingham, Wash.
Loy, Alfred Walter.....	Agri.	Fr.	Buena Vista
Luebke, George.....	L. E.	Soph.	Toutle, Wash.
Luebke, James.....	M. E.	Jr.	Toutle, Wash.
Lundgren, Alice.....	H. E.	Jr.	Corvallis
Luper, Loren John.....	Agri.	Soph.	Tangent
Lyne, Phyllis Ellen.....	H. E.	Spec.	Creston, B. C.
Lytle, Grace.....	Com.	Fr.	Bonanza
McBride, Lola Winifred.....	H. E.	Jr.	Eddyville
McCaffrey, Lawrence Martin.....	For.	Sr.	Dayton, Ohio
McCain, Isla Mae.....	Com.	Soph.	Corvallis
McCart, Marion.....	Agri.	Fr.	McMinnville
McCaslin, Clifford H.....	Agri.	Fr.	Portland
McCaw, Bessie Constance.....	H. E.	Soph.	Prescott, Wash.
McCaw, Ernest R.....	Agri.	Spec.	Prescott, Wash.
McCaw, Jay M.....	Agri.	Spec.	Prescott, Wash.

Name	Course	Rank	Home Address
McCaw, Ruth Ida.....	H. E.	Fr.	Prescott, Wash.
McCaw, William Edwin.....	Agri.	Spec.	Prescott, Wash.
McClain, Arthur Elmer.....	Com.	Jr.	Salem
McClanathan, Robert Allen.....	Hi. E.	Soph.	Astoria
McCollum, Charles Adelbert.....	For.	Sr.	Salinas, Calif.
McComb, Allen Wallace.....	Agri.	Soph.	Klamath Falls
McCormack, Raymond Elwood.....	C. E.	Fr.	Roseburg
McCornack, Alice.....	H. E.	Sr.	Marcola
McCornack, Eugene Francis.....	Agri.	Sr.	Klamath Falls
McCornack, Helen J.....	H. E.	Soph.	Marcola
McCready, Lloyd John.....	Com.	Fr.	Corvallis
McCullough, Addie.....	H. E.	Jr.	Portland
McDonald, Mrs. H. C.....	Com.	Spec.	Corvallis
McEwen, Dan F.....	Agri.	Sr.	Portland
McEwen, Robert V.....	Agri.	Fr.	Milton
McGeorge, William Lee.....	C. E.	Sr.	Eugene
McGinnis, Mrs. Lynette Kerr.....	Com.	Spec.	Corvallis
McGinty, Walter Gibson.....	Agri.	Voc.	Davis Creek, Calif.
McGilchrist, George M.....	Agri.	Soph.	Salem
McGowan, Earl.....	E. E.	Fr.	Corvallis
McHugh, Edith Lillian.....	Com.	Spec.	Corvallis
McIntyre, John Henry.....	Agri.	Fr.	Coalinga, Calif.
McKay, Harold Delwin.....	Com.	Fr.	Corvallis
McKinnis, Fern.....	Com.	Spec.	Summerville
McKnight, Mildred.....	H. E.	Fr.	Albany
McLagan, Eva Crystal.....	Phar.	Jr.	Tangent
McLagan, Ruby May.....	H. E.	Sr.	Tangent
McLeary, Robert William.....	Chem. E.	Fr.	Albany
McMaster, Marion Edna.....	Com.	Spec.	Corvallis
McMaster, Cedric Stuart.....	Agri.	Sr.	Corvallis
McMindes, Elvin Winfield.....	Agri.	Sr.	Milwaukee, Wis.
McMinn, Bryan Towne.....	M. E.	Sr.	Portland
McMinn, Grace Blanche.....	Phar.	Soph.	Portland
McPherson, Walter Jay.....	M. A.	Spec.	Forest Grove
McRae, Mary Ellen.....	Opt.		Riverside
McReynolds, Jasper Alvin.....	Com.	Voc.	Dufur
Maag, Esther Verna.....	H. E.	Jr.	Salem
Mack, Lawrence Wallace.....	M. E.	Sr.	Dufur
Maclean, Pauline.....	H. E.	Fr.	Portland
MacCrow, Hughretta.....	Com.	Spec.	Goldendale, Wash.
MacDonald, Horace.....	Chem. E.	Fr.	Corvallis
Madsen, Alvin H.....	Agri.	Spec.	Silverton
Madsen, Lillie Lauretta.....	Com.	Fr.	Silverton
Magness, Virginia Byrd.....	H. E.	Spec.	Amity
Magnuson, Hazel J.....	H. E.	Jr.	Everett, Wash.
Mahan, Adelaide Stevens.....	H. E.	Soph.	Chicago, Ill.
Mahan, Susie.....	Com.	Fr.	Baker
Mainwaring, William Bernard.....	Com.	Jr.	Newberg
Malone, Earl Nicholas.....	Agri.	Jr.	Castle Rock, Wash.
Manning, Allen Munroe.....	E. E.	Soph.	Vancouver, Wash.

Name	Course	Rank	Home Address
Manning, George E.	Com.	Soph.	Salem
Manny, Ida Lillian	H. E.	Jr.	Portland
Manny, Margaret W.	H. E.	Fr.	Portland
Mardis, Loche H.	Com.	Jr.	McMinnville
Marsh, Isis	H. E.	Spec.	Marshfield
Marshall, Julian Stephen	Min.	Jr.	Corvallis
Martens, Mamie	Com.	Soph.	Chinook, Mont.
Martens, Marcus Henry	Com.	Fr.	Chinook, Mont.
Martin, Emily C.	H. E.	Soph.	Corvallis
Martin, Elsie Paulien	H. E.	Jr.	McMinnville
Martin, Lois Maeble	H. E.	Fr.	McMinnville
Mason, Ben	M. E.	Sr.	Puyallup, Wash.
Mason, Earl George	For.	Jr.	Salem
Mason, Howard	Agri.	Jr.	Pasadena, Calif.
Mather, Irving Allen	Chem. E.	Soph.	San Diego, Calif.
Mathiesen, Edwin L.	Com.	Voc.	Grays River, Wash.
Matten, Alta Elizabeth	H. E.	Fr.	Salem
Matthews, Aner Logan	Agri.	Fr.	Amity
Mattox, William Forrest	Min.	Soph.	Long Beach, Calif.
Maurer, Pansy	Phar.	Jr.	Eugene
Maxwell, Ben	Agri.	Fr.	Salem
Maxwell, Grace Eleanor	H. E.	Soph.	Weiser, Idaho
Maxwell, Omer Oliver	Agri.	Fr.	Haines
May, Lulu Litten	H. E.	Sr.	Grass Valley
Meacham, Clifford P.	Agri.	Soph.	Weiser, Idaho
Meacham, Leta M.	H. E.	Sr.	Weiser, Idaho
Meade, William Vanard	M. E.	Soph.	Orengo
Medler, Arthur Henry	Com.	Voc.	Wasco
Medley, James W.	M. E.	Fr.	Oakland
Meier, Albert Otto	Agri.	Sr.	Hillsdale
Melis, Fannie Elizabeth	H. E.	Fr.	Mist
Meloy, Kathleen O.	Com.	Fr.	Corvallis
Meloy, Lulu V.	Com.	Fr.	Corvallis
Mende, Herman W.	Agri.	Fr.	North Bend
Mentzer, Alta Belle	H. E.	Fr.	Corvallis
Mentzer, Leland	I. A.	Jr.	Pendleton
Merritt, Mona Rosalie	Opt.		Corvallis
Meshner, Sophie	H. E.	Sr.	Portland
Meyer, Arnold	M. E.	Fr.	Snohomish, Wash.
Meyer, Laura Minnie	Com.	Voc.	Centralia, Wash.
Meyer, Leland Edward	Agri.	Fr.	Palo Alto, Calif.
Middlekauf, Ruth Helen	H. E.	Soph.	Corvallis
Mihnos, Edythe Victoria	Com.	Fr.	Portland
Milledge, Faye Mildred	Com.	Fr.	Roseburg
Miller, Alice Ruth	Com.	Soph.	Corvallis
Miller, Cecil Harold	Agri.	Fr.	Peoria, Ariz.
Miller, Clare Alfred	E. E.	Soph.	Oregon City
Miller, Curtis	Com.	Soph.	Union
Miller, Eula Ellen	H. E.	Jr.	Corvallis
Miller, Leslie A.	Agri.	Soph.	Grand Forks, B. C.
Miller, Lloyd C.	E. E.	Soph.	Portland

Name	Course	Rank	Home Address
Miller, Maude.....	H. E.	Spec.	Klamath Falls
Mills, Harold Milton.....	Agri.	Sr.	Parma, Idaho
Misson, William H.....	C. E.	Fr.	Arleta
Mize, Katie Olive.....	H. E.	Fr.	Salem
Moberg, James Dalgety.....	E. E.	Sr.	Astoria
Mohney, Curtis Gilliam.....	Min.	Soph.	Salem
Moody, Charlotte Elizabeth.....	H. E.	Sr.	Pasadena, Calif.
Moon, Oris Orville.....	M. E.	Fr.	Fort Klamath
Moore, Edwin M.....	For.	Spec.	Corvallis
Moore, Genevieve.....	H. E.	Soph.	Corvallis
Moore, Iva Grace.....	Com.	Fr.	Corvallis
Moore, Leland Bernard.....	Agri.	Sr.	Gresham
Moore, Myra Lucille.....	H. E.	Sr.	Corvallis
Moore, Neva L.....	Com.	Fr.	Corvallis
Morcom, Etta M.....	H. E.	Soph.	Corvallis
Morcom, Margaret Myrtle.....	H. E.	Soph.	Corvallis
Morgan, Beulah Inez.....	H. E.	Sr.	Corvallis
Morgan, Charles Leslie.....	E. E.	Soph.	Portland
Morgan, Helen.....	H. E.	Voc.	Portland
Moreland, Clark E.....	Agri.	Voc.	Corvallis
Moreland, Heber M.....	Agri.	Fr.	Corvallis
Moreland, Helen Margaret.....	H. E.	Fr.	Portland
Morley, Frances M.....	H. E.	Soph.	Silverton
Morrell, Alfred W.....	Agri.	Soph.	Arcata, Calif.
Morrell, Arta Belle.....	H. E.	Fr.	Deer Island
Morrill, Dorothy Clark.....	H. E.	Soph.	Vancouver, B. C.
Morris, Homer B.....	M. E.	Sr.	Yamhill
Morris, Ray A.....	Agri.	Jr.	Oregon City
Morrison, Ernest.....	E. E.	Soph.	Roseburg
Morrow, William Harold.....	Agri.	Jr.	Portland
Morse, Leander Charles.....	Agri.	Fr.	Berkeley, Calif.
Morton, Arthur Hale.....	Agri.	Fr.	Camas, Wash.
Morton, Ruth.....	H. E.	Sr.	White Salmon, Wash.
Mose, Donald Wesley.....	E. E.	Fr.	Corvallis
Moulton, Arthur S.....	Agri.	Jr.	Portland
Moulton, Edna Anna.....	Agri.	Fr.	Portland
Muller, Ruth Margaret.....	H. E.	Jr.	Eugene
Munkers, Frances.....	Com.	Fr.	Portland
Munson, Robert Bliss.....	Com.	Soph.	New York, N. Y.
Murhard, Erroll Alexander.....	C. E.	Soph.	Portland
Murray, Albert Samuel.....	E. E.	Fr.	Vale
Murray, Willette B.....	Agri.	Fr.	Hawthorne, Calif.
Murphy, Harry C.....	For.	Fr.	Portland
Mushrush, Floyd Milton.....	Min.	Fr.	Pasadena, Calif.
Myers, Clair E.....	Phar.	Soph.	Pendleton
Myers, Clarence William.....	Agri.	Sr.	Moneta, Calif.
Myers, Francis P.....	M. E.	Sr.	Corvallis
Myers, George Edward.....	M. E.	Fr.	Corvallis
Myers, Ruth Eleanor.....	Phar.	Fr.	Corvallis
Myers, Stanley Howard.....	E. E.	Sr.	Corvallis
Naderman, George.....	M. E.	Jr.	Turner

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Naftel, Veda Pearl.....	H. E.	Spec.	Pomona, Calif.
Neal, Martina Ruth.....	H. E.	Sr.	Santa Cruz, Calif.
Nebergall, Raymond Arthur.....	For.	Fr.	Albany
Nelson, Herbert.....	Agri.	Soph.	Mt. Vernon, Wash.
Nesbitt, Clarence Scott.....	Com.	Sr.	Payette, Idaho
Nestelle, Fred W.....	Agri.	Sr.	Bellingham, Wash.
Nettleton, Harry Ira.....	Agri.	Soph.	La Porte, Colo.
Neuhaus, Karl Frank.....	Agri.	Jr.	Corvallis
Nevius, John R.....	Agri.	Jr.	Long Beach, Calif.
Newbry, Lester Edward.....	Agri.	Fr.	Kimberly, Idaho
Newcomber, Lucian Edwin.....	Agri.	Soph.	Colton, Calif.
Newman, Meier.....	Com.	Sr.	Portland
Newport, Beatrice Ione.....	Opt.		Lebanon
Newton, Ralph L.....	Agri.	Spec.	Drain
Niblen, Amy C.....	H. E.	Sr.	Portland
Nichols, Benjamin Hodge.....	M. E.	Jr.	Glendale, Calif.
Nichols, Eleanor Bailey.....	Com.	Soph.	The Dalles
Nichols, Floyd Myron.....	E. E.	Jr.	Corvallis
Nichols, Tressa Elizabeth.....	Com.	Sr.	Corvallis
Nicholson, Frances.....	Phar.	Fr.	Puyallup, Wash.
Nielson, Sidney M.....	Agri.	Jr.	Ferndale, Calif.
Niles, Wallace.....	Agri.	Fr.	Grants Pass
Nisson, Clara Mae.....	Com.	Spec.	Corvallis
Noble, Audrey M.....	H. E.	Soph.	Prineville
Nordling, David M.....	I. A.	Sr.	Colton
Norgren, Clarence.....	Agri.	Fr.	Vancouver, Wash.
Norris, Rita.....	H. E.	Jr.	Boise, Idaho
North, David Starr.....	I. A.	Sr.	Corvallis
Norton, Mabel.....	H. E.	Spec.	Corvallis
Norton, Winfield Leonard.....	Agri.	Jr.	Corvallis
Nunn, Harry.....	Com.	Fr.	Corvallis
Oakleaf, Ruth D.....	Com.	Soph.	Washington, D. C.
Oatfield, Ernest W.....	Agri.	Voc.	Skamokawa, Wash.
Officer, Joseph Wade.....	Agri.	Spec.	Izee
Oliver, Alfred W.....	Agri.	Sr.	Salem
Olsen, Edward Carl.....	Com.	Fr.	Portland
Olson, Philip James.....	M. A.	Voc.	Grays River, Wash.
Olson, Sigfred Gustav.....	E. E.	Fr.	Albany
Opedal, Martha.....	H. E.	Soph.	Silverton
O'Rourke, Edgar M.....	Com.	Fr.	Mountaindale
Orr, George David.....	Agri.	Soph.	Corvallis
Orr, John Judson.....	I. A.	Soph.	Corvallis
Oschmann, Walter S.....	M. E.	Spec.	Chicago, Ill.
Ostien, Tom L.....	Min.	Soph.	Monmouth
Ostrander, Aubrey.....	Agri.	Jr.	Portland
Ostrander, Wilbur Wesley.....	M. A.	Voc.	Gold Beach
Overstreet, Robert S.....	Agri.	Voc.	Nyssa
Packard, Otto Bernard.....	E. E.	Soph.	Santa Ana, Calif.
Paine, Cecile Elma.....	Com.	Spec.	Corvallis
Paine, Charles L.....	Com.	Sr.	Caldwell, Idaho
Paine, Mrs. Chas. L.....	H. E.	Soph.	Eugene

Name	Course	Rank	Home Address
Paine, John D.	Agri.	Soph.	Caldwell, Idaho
Paine, Lincoln H. Jr.	Com.	Sr.	Caldwell, Idaho
Palfrey, Ernest Ralph	Agri.	Fr.	Molalla
Palmer, Beatrice Lucy	Com.	Fr.	Cowichan Sta., B. C.
Palmer, Bert Cecil	Com.	Jr.	Jordan Valley
Palmer, Lowell Elbert	Com.	Soph.	Jordan Valley
Papenfus, Edith Marie	H. E.	Fr.	Creswell
Pardee, Josiah B.	E. E.	Fr.	Grants Pass
Parker, Alan B.	Agri.	Soph.	Pasadena, Calif.
Partin, Rae	H. E.	Sr.	Summer Lake
Parsons, Cyril Malcolm	Hi. E.	Soph.	Bonanza
Patchin, Alonzo William	Agri.	Fr.	Salem
Paterson, Daniel McColl	Agri.	Spec.	Portland
Patton, Palmer	Agri.	Sr.	Chicago, Ill.
Patty, Florence Valeria	H. E.	Soph.	Amity
Pauling, Linus Carl	Chem. E.	Fr.	Portland
Paull, James Gregory	Agri.	Sr.	Los Angeles, Calif.
Paulson, Anna Josephine	H. E.	Voc.	Corvallis
Paulson, Oscar	Agri.	Soph.	Corvallis
Payne, George Franklin	Agri.	Fr.	Corvallis
Payne, Eugene Fulwar	Agri.	Soph.	Corvallis
Payton, Wesley Eugene	Agri.	Fr.	Baker
Payzant, Charles Y.	Agri.	Spec.	Chehalis, Wash.
Pearson, Edna J.	H. E.	Fr.	Portland
Pearson, Lillian Jenkins	Com.	Fr.	Roseburg
Peaslee, Ruth E.	H. E.	Spec.	Oswego
Peavy, Bradley A.	For.	Soph.	Corvallis
Pecson, Evaristo C.	Com.	Fr.	Pangasinan, P. I.
Pendergrass, Travis Ray	Phar.	Spec.	Clovis, Calif.
Pernot, Dorothy Doris	H. E.	Fr.	Corvallis
Perry, Dale Alfred	Agri.	Soph.	St. Helens
Perry, Jesse Lee	C. E.	Soph.	Portland
Peterson, Alice A.	Com.	Fr.	Chehalis, Wash.
Peterson, Carl Albin	M. E.	Fr.	Orengo
Peterson, Inez Mae	Com.	Jr.	Corvallis
Peterson, Nettie Lucile	H. E.	Fr.	Ontario
Peterson, Sigurd H.	Opt.		Corvallis
Pettigrew, Ruth	Com.	Fr.	Redmond
Phillips, Alfred B.	Agri.	Fr.	Kelso, Wash.
Phillips, Hazel Elsie	Com.	Jr.	Izee
Phillips, James Robert	For.	Soph.	Corvallis
Phillips, Kenneth	C. E.	Soph.	Albany
Phillips, Ruth Haas	Com.	Spec.	Corvallis
Pinney, Irene A.	H. E.	Fr.	Kelso, Wash.
Pierce, Lucile	H. E.	Soph.	La Grande
Pietzker, Henry Fred	H. E.	Jr.	Portland
Pigg, Frederica I.	Com.	Fr.	Anaconda, Mont.
Pimm, Charles Jesse	E. E.	Sr.	Philomath
Pine, Willaim Douglas	Agri.	Sr.	Berkeley, Calif.
Pinney, Earl H.	E. E.	Soph.	Newberg
Pitney, Mary Eleanor	H. E.	Sr.	Junction City

Name	Course	Rank	Home Address
Planta, Olive Montgomery	Agri.	Spec.	Nanaimo, Canada
Platt, Eugene Dewey	Agri.	Fr.	Claremont, Calif.
Plue, Vilas Leone	Com.	Sr.	Rainier
Poley, Evangeline Collins	H. E.	Soph.	Ashland
Pollanz, Percy Edward	Agri.	Soph.	West Linn
Polson, Nellie Irene	H. E.	Sr.	Mt. Vernon, Wash.
Poole, Leslie Erving	M. E.	Soph.	Corvallis
Poole, Roy M.	Min.	Jr.	Hillsboro
Porter, Mildred	Com.	Fr.	Corvallis
Porter, Nellie Bly	H. E.	Soph.	Silverton
Posadas, Victorina C.	Com.	Fr.	Bacnotan, P. I.
Powell, Clares Clinton	E. E.	Soph.	Monmouth
Powell, Delma Ester	Com.	Spec.	Corvallis
Powell, DeWitt Elvin	Min.	Soph.	Corvallis
Powell, George Arthur	Com.	Fr.	Portland
Powell, Perry Nelson	M. E.	Fr.	Monmouth
Powell, Wilmer Dwight	Agri.	Jr.	Monmouth
Powers, Robert M.	For.	Fr.	Corvallis
Powers, Verne	H. E.	Jr.	Corvallis
Prather, Harry Albert	Phar.	Soph.	Klamath Falls
Prather, Marie Alma	Com.	Jr.	Corvallis
Presley, A. C.	Agri.	Soph.	Grants Pass
Preston, Edward Lincoln	Agri.	Jr.	Dallas
Price, Elise Groves	H. E.	Soph.	Sifton, Wash.
Price, F. Earl	Agri.	Fr.	Woodlake, Calif.
Price, Frank Emerson	For.	Spec.	Illahee
Price, Gladys Beatrice	H. E.	Fr.	Oakland
Price, Inez Fay	H. E.	Spec.	Springfield
Price, Martha Jane	Com.	Voc.	Illahee
Proctor, Will Henry	Com.	Soph.	Ogdensburg, N. Y.
Proudfit, Arthur	Agri.	Fr.	Salt Creek, Wyo.
Pubols, Freida Martha	Com.	Spec.	Hillsboro
Pugh, James E.	Opt.		Wrens
Pugh, John McKinley	Agri.	Soph.	Shedd
Quimby, Ethel Annette	H. E.	Fr.	Halsey
Quackenbush, Roy M.	E. E.	Fr.	Portland
Raab, Lloyd B.	Com.	Fr.	Seattle, Wash.
Rachford, Darrell Wm.	For.	Fr.	Alturas, Calif.
Radcliff, Edward Everett	Agri.	Jr.	Burbank, Calif.
Rahn, Fred William	Agri.	Fr.	Pasadena, Calif.
Rains, Opal	H. E.	Jr.	Oregon City
Ray, Howard C.	Agri.	Sr.	Roslyn, Wash.
Ray, Margaret Wright	H. E.	Fr.	Portland
Raymond, James A.	C. E.	Fr.	Drain
Raymond, Thayer	H. E.	Jr.	Raymond, Wash.
Reardon, Barton	I. A.	Jr.	Corvallis
Rearden, Henry	Com.	Jr.	Corvallis
Reber, Albert R.	Agri.	Sr.	Kansas City, Kan.
Records, Warren Willis	Agri.	Soph.	Umapine
Redmond, Agnes Theresa	H. E.	Sr.	Portland
Reed, Ada	H. E.	Sr.	Portland

Name	Course	Rank	Home Address
Reed, Eldred B.....	I. A.	Fr.	Corvallis
Reed, Florence Helen.....	Com.	Voc.	Portland
Rees, Elsie Fern.....	H. E.	Fr.	Ontario
Reeves, Carroll Francis.....	M. E.	Fr.	Corvallis
Regnell, Lloyd Clifford.....	For.	Jr.	Hood River
Reichart, Natalie.....	Com.	Fr.	Corvallis
Reitsma, Catharina.....	H. E.	Soph.	Portland
Rencehausen, William Edwin.....	Com.	Fr.	North Bend
Resing, J. Lucille.....	Com.	Fr.	Portland
Reynolds, Cecil E.....	L. E.	Fr.	Colton, Calif.
Reynolds, Earl Childers.....	Agri.	Jr.	La Grande
Reynolds, Gladys Opal.....	H. E.	Soph.	Independence
Reynolds, Joe A.....	Agri.	Fr.	La Grande
Reynolds, Loren F.....	E. E.	Fr.	Selma
Rhea, Hugh.....	M. E.	Fr.	Echo
Rice, Gladys.....	H. E.	Jr.	Corvallis
Rice, Leaton Alanson.....	Min.	Sr.	Corvallis
Richards, Cordelia Dale.....	Com.	Voc.	Goldendale, Wash.
Richards, Eva.....	H. E.	Fr.	Salem
Richards, Thomas Edmund.....	Agri.	Fr.	Kimberly, Idaho
Richards, William Francis.....	Agri.	Voc.	Twin Falls, Idaho
Richardson, Elizabeth Clay.....	Com.	Soph.	Portland
Riches, Harry LaBare.....	Agri.	Spec.	Silverton
Richter, Paul E.....	Agri.	Jr.	Portland
Ricketts, Ellsworth Gould.....	Hi. E.	Jr.	Portland
Ricketts, Fay Lincoln.....	Com.	Fr.	Portland
Rickson, Carl A.....	For.	Soph.	Portland
Riddell, Christine Elsie.....	H. E.	Spec.	Mountain Home, Idaho
Riggs, Leib L.....	Chem. E.	Fr.	Corvallis
Riippa, Warnard.....	Chem. E.	Jr.	Astoria
Ritchie, Douglas Wm.....	Agri.	Sr.	Corvallis
Ritter, Herman M.....	Agri.	Fr.	Pasadena, Calif.
Roake, John Albert.....	Chem. E.	Soph.	Oregon City
Robertson, Edward L.....	Com.	Fr.	Portland
Robertson, Mary Catherine.....	H. E.	Jr.	Portland
Robinson, Edna Aletha.....	H. E.	Fr.	Coquille
Robinson, Edward I.....	Chem. E.	Spec.	Canton, Ohio
Robinson, Elise Daphne.....	Opt.		Cambridge, Idaho
Robinson, George Vinton.....	C. E.	Jr.	Forest Grove
Roche, Chester.....	Agri.	Soph.	Brownsville
Rodolf, Carl F.....	C. E.	Fr.	Corvallis
Roehrig, Stewart.....	E. E.	Fr.	Pasadena, Calif.
Rogers, Lavina A.....	Com.	Fr.	Portland
Rogers, Lucy Elizabeth.....	H. E.	Fr.	Corvallis
Rogers, Margaret.....	Com.	Fr.	Berkeley, Calif.
Rogers, Mary Alice.....	H. E.	Sr.	Corvallis
Rood, Marjorie L.....	Com.	Fr.	Portland
Rose, Charles Duncan.....	Agri.	Soph.	Seattle, Wash.
Roseman, Arthur Mills.....	Agri.	Jr.	Dayton
Rosen, Morris.....	Agri.	Fr.	Los Angeles, Calif.
Ross, Linden N.....	Agri.	Jr.	Los Angeles, Calif.

Name	Course	Rank	Home Address
Ross, Frank E.....	Min.	Soph.	Central Point
Ross, Lucile.....	H. E.	Soph.	Eugene
Rotschy, Henry.....	Agri.	Voc.	Yacolt, Wash.
Routledge, Ruth Adeline.....	Opt.		Portland
Row, A. Narayana.....	Com.	Sr.	Kudaravalli, India
Rowe, Harry John.....	E. E.	Spec.	Goodland, Kan.
Ruegg, Pearle Marie.....	Com.	Fr.	Gresham
Runyan, Wilbur Arthur.....	C. E.	Sr.	Portland
Rundell, Hugh Dean.....	M. E.	Jr.	Newberg
Russell, Carl.....	E. E.	Fr.	Sweet Home
Russell, Charles Joseph.....	Agri.	Soph.	Pendleton
Russell, Frank Leitch.....	For.	Jr.	Portland
Russell, John Robert.....	Agri.	Fr.	Portland
Rycraft, Forest Vernon.....	Agri.	Fr.	Corvallis
Rydberg, Iver Louis.....	Agri.	Fr.	San Diego, Calif.
Sabin, Lynn Platt.....	Com.	Soph.	Grants Pass
Salisbury, Arthur Cole.....	M. E.	Fr.	Turner
Samuelson, Oliver Lorenzo.....	Agri.	Spec.	Brownsville
Sanborn, Lynn Durrell.....	Agri.	Soph.	Los Angeles, Calif.
Sandon, Grace Rea.....	Com.	Fr.	Corvallis
Sandon, Helen Beatrice.....	H. E.	Jr.	Corvallis
Sanford, Ida C.....	Com.	Spec.	Fairport, Calif.
Sappington, Mrs. Kate Kelly.....	Com.	Spec.	Corvallis
Sarna, Sajjan S.....	Agri.	Soph.	Rawal Pindi City, India
Saunders, Edward Towle.....	Hi. E.	Jr.	Portland
Saunders, Esther Blanche.....	Com.	Fr.	Richland
Saunders, Laurence Henry.....	Agri.	Fr.	El Cajon, Calif.
Saunders, Lida Jane.....	Opt.		Richland
Saunders, Mabel Edna.....	Opt.		Richland
Sawyer, Doris.....	H. E.	Sr.	Salem
Sawyers, Ruth Leona.....	H. E.	Soph.	Santa Barbara, Calif.
Say, John McDonald.....	Agri.	Voc.	Sherwood
Scea, Helen Lenore.....	H. E.	Soph.	Milton
Scea, Paul Wildie.....	Com.	Soph.	Milton
Schiewe, Ben Nathan.....	M. E.	Fr.	Portland
Schmidt, Martha Selma.....	Com.	Spec.	Corvallis
Schminky, Harold Bruce.....	Hi. E.	Soph.	Eagle Creek
Schoren, Helen Margaret.....	Com.	Fr.	The Dalles
Schoth, Albert Joseph.....	Agri.	Sr.	Oregon City
Schott, Rena.....	H. E.	Sr.	Salem
Schreiber, Esther Louise.....	H. E.	Jr.	Chanton, Iowa
Schubert, Placidus James.....	E. E.	Fr.	Corvallis
Schutt, Marjorie Laura.....	H. E.	Soph.	Corvallis
Schwarz, George M.....	E. E.	Jr.	Portland
Schwarz, Sigmund C.....	Chem. E.	Soph.	Portland
Scott, Albert Miles.....	Agri.	Jr.	Ada
Scott, Elmer Riggs.....	Agri.	Soph.	Ada
Scott, Jennie Ritchie.....	Com.	Spec.	Corvallis
Scott, Mary Ritchie.....	Agri.	Spec.	Corvallis
Scotton, Edwin B.....	E. E.	Fr.	Portland

Name	Course	Rank	Home Address
Scritsmier, Lester Jake.....	Com.	Fr.	Long Beach, Calif.
Seavey, Grace.....	Com.	Spec.	Port Townsend, Wash.
Sebo, Clarence.....	Agri.	Soph.	Silverton
Seibert, Emil.....	Com.	Soph.	Pendleton
Seidl, Albert Carl.....	Com.	Fr.	Troutdale
Seifert, Lucille Caroline.....	H. E.	Fr.	Roy, Wash.
Sein, Walterio M.....	Agri.	Soph.	Los Angeles, Calif.
Seley, Frances Mariam.....	H. E.	Soph.	Portland
Selover, Eleanor Marie.....	H. E.	Jr.	Ignacio, Colo.
Selph, Raymond G.....	Agri.	Sr.	Los Angeles, Calif.
Serier, Edith Ann.....	Phar.	Fr.	Washtucna, Wash.
Sevilla, Diego A.....	E. E.	Fr.	San Isidro, P. I.
Shafer, Carl Balford.....	I. A.	Voc.	Seneca, Mo.
Shake, Helen Frances.....	Com.	Fr.	Payette, Idaho
Shank, Earl Henry.....	C. E.	Fr.	Hood River
Shank, Ernest Elam.....	Com.	Spec.	Hood River
Sharkey, Clement J.....	Min.	Fr.	Portland
Shaver, Leonard R.....	Com.	Jr.	Portland
Shaver, Ralph Thomas.....	E. E.	Fr.	Sutherlin
Shaver, Zela.....	H. E.	Spec.	Molalla
Shaw, Helen.....	H. E.	Fr.	Harley, Idaho
Shaw, Ralph Fred.....	Agri.	Sr.	Portland
Shea, Esther E.....	H. E.	Soph.	Portland
Shedd, Bertha Lucille.....	H. E.	Sr.	Shedd
Sheffield, Frank Brizee.....	For.	Soph.	Newport
Shelley, Marjorie.....	H. E.	Soph.	Everett, Wash.
Shelton, Wilbur W.....	Com.	Soph.	Pomeroy, Wash.
Shen, Peng Fei.....	For.	Soph.	Washington, D. C.
Sheppard, W. O.....	Com.	Jr.	Hood River
Sherfy, Harold E.....	Agri.	Fr.	Lebanon
Sherfy, Vest E.....	H. E.	Fr.	Lebanon
Shirley, Marguerite.....	Com.	Fr.	Weiser, Idaho
Shopp, Marie Louise.....	Com.	Fr.	Orchards, Wash.
Short, E. Francis.....	Com.	Soph.	Long Beach, Calif.
Shotwell, Jesse Gordon.....	Hi. E.	Soph.	Hermiston
Sias, Salome.....	Phar.	Fr.	Forest Grove
Simpson, Charles Eldon.....	Com.	Soph.	Carrolls, Wash.
Sinks, Lenora D.....	H. E.	Soph.	Portland
Sinner, Henry.....	Agri.	Voc.	Kalama, Wash.
Skelton, Joe Taff.....	Chem. E.	Fr.	Corvallis
Skidmore, Maude M.....	H. E.	Sr.	Curtin
Skinner, Ruby Aileen.....	Com.	Spec.	Jordan Valley
Skinner, Verne Claire.....	H. E.	Voc.	Jordan Valley
Skov, Maren Julia.....	H. E.	Fr.	Ferndale, Calif.
Slater, Richard T.....	Com.	Fr.	Sutherlin
Slayton, Mabel Adaline.....	H. E.	Jr.	Prineville
Slayton, Mildred Lura.....	H. E.	Jr.	Prineville
Smiley, Frank B.....	Agri.	Fr.	Independence
Smiley, James Ray.....	E. E.	Soph.	Corvallis
Smith, Aaron Johnson.....	C. E.	Soph.	Long Beach, Calif.
Smith, Cecil Starr.....	For.	Soph.	Portland

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Smith, Elizabeth Frances.....	Com.	Soph.	Portland
Smith, Elva L.....	H. E.	Sr.	Portland
Smith, Everett Lathrop.....	Agri.	Soph.	Pasadena, Calif.
Smith, Floyd Arthur.....	E. E.	Soph.	Lakeview
Smith, Grace Elizabeth.....	H. E.	Soph.	Portland
Smith, Hiram Chester.....	I. A.	Sr.	Kansas
Smith, Janie Vivian.....	Com.	Fr.	Medford
Smith, Leon Adell.....	H. E.	Sr.	Carnation
Smith, Lewis.....	E. E.	Fr.	Missoula, Mont.
Smith, Sterling William.....	E. E.	Soph.	Portland
Smith, Thomas Willis.....	Agri.	Fr.	Claremont, Calif.
Smith, Virginia Middleton.....	H. E.	Fr.	Ontario
Smith, Wallace W.....	Agri.	Jr.	Marsovan, Turkey
Smith, Wilbur Joseph.....	M. E.	Soph.	Rainier
Snall, Caralie Alice.....	For.	Spec.	Astoria
Snowberg, Fred T.....	Phar.	Sr.	Warren, Ind.
Soderstrom, Victoria.....	H. E.	Jr.	Halsey
South, Lawrance G.....	M. E.	Fr.	Pendleton
Southern, Raymond D.....	Chem. E.	Soph.	Halsey
Spain, Gail Elliot.....	M. E.	Soph.	Portland
Spamer, Elsie Josephine.....	H. E.	Fr.	Beaverton
Sparks, Irene Louise.....	H. E.	Spec. Medicine	Lodge, Kan.
Specht, Mabel.....	H. E.	Soph.	Portland
Spicer, Bertie W.....	Agri.	Fr.	Alturas, Calif.
Spengler, Carl Jacob.....	Com.	Fr.	Great Falls, Mont.
Spika, Edwin Axtel.....	Phar.	Spec.	Grand Junction, Colo.
Spires, Elton C.....	Agri.	Soph.	Myrtle Point
Spires, Roy L.....	C. E.	Soph.	Myrtle Point
Spitzbart, Esther Barbara.....	Com.	Fr.	Salem
Spitzbart, Freda Georgene.....	Com.	Soph.	Salem
Spitzbart, Leo George.....	Agri.	Fr.	Salem
Spriggs, Glenn E.....	Com.	Fr.	Medford
Spriggs, James Llewellyn.....	Agri.	Jr.	Medford
Staats, Ben Chester.....	Agri.	Fr.	Portland
Staats, Vere Leslie.....	Phar.	Soph.	Airlie
Staff, Selma Josephine.....	H. E.	Fr.	Kelso, Wash.
Staiger, Guy A.....	Phar.	Jr.	Corvallis
Stansbery, Edgar Harlan.....	Agri.	Fr.	Portland
Stanton, Richard Edwin.....	M. E.	Fr.	Portland
Stark, Leslie M.....	Com.	Sr.	Holrege, Neb.
Stearns, Emel Everett.....	M. E.	Fr.	Klamath Falls
Stearns, Val M.....	Agri.	Fr.	Los Angeles, Calif.
Steele, Isabelle Alice.....	H. E.	Soph.	Portland
Steel, Joseph Irvine.....	For.	Soph.	Portland
Steele, Ruth.....	H. E.	Soph.	Creswell
Stegerwald, Andrew.....	Opt.		Corvallis
Stelling, John Lloyd.....	Agri.	Jr.	San Jose, Calif.
Stephenson, Mervin.....	Hi. E.	Jr.	Condon
Steusloff, Claude H.....	Agri.	Jr.	Salem
Steward, Albert N.....	Agri.	Soph.	Omak, Wash.
Stewart, Harry J.....	Agri.	Jr.	Portland

Name	Course	Rank	Home Address
Stewart, Irene.....	Com.	Fr.	Aurora
Stewart, James Ivan.....	Com.	Soph.	Fossil
Stewart, James Oscar.....	Agri.	Jr.	Medford
Stewart, Robert Alexander.....	Agri.	Soph.	Portland
Stewart, Ruth M.....	H. E.	Soph.	Portland
Stimpson, Etta Lorene.....	H. E.	Jr.	Corvallis
Stimson, William Henry.....	M. A.	Voc.	Medford
Stone, Archie Edward.....	M. E.	Soph.	Rockford, Ill.
Stone, Erwin Patton.....	Phar.	Soph.	Maynardville, Tenn.
Stone, Herman Al.....	Agri.	Sr.	Woodburn
Stow, William Raymond.....	Agri.	Sr.	Corvallis
Strain, Hazel Marie.....	H. E.	Fr.	Pendleton
Strain, Stephanie.....	H. E.	Soph.	Portland
Strahl, Newton Fenton.....	Com.	Soph.	Centerville, Wash.
Strange, Rose.....	Phar.	Spec.	Vancouver, Wash.
Stratton, Lorena Alberta.....	H. E.	Fr.	Medford
Straughn, Orson L.....	Agri.	Sr.	Pendleton
Strief, Hazel Jean.....	H. E.	Soph.	Portland
Strome, Glenn Smyth.....	Agri.	Sr.	Eugene
Strome, Katherine.....	H. E.	Jr.	Junction City
Strong, Charles Wesley.....	Com.	Soph.	Monmouth
Strong, Ralph L.....	Chem. E.	Fr.	Elk City, Idaho
Strout, Eugene Lucas.....	Com.	Fr.	Amity
Stuart, Donald Bruce.....	E. E.	Soph.	
Stuart, George A.....	Com.	Fr.	Latourelle
Stuart, Ray T.....	M. E.	Fr.	Nampa, Idaho
Sturchler, Martha.....	H. E.	Jr.	Cleveland, Ohio
Stutz, Lelia B.....	H. E.	Soph.	Corvallis
Sutton, Lee.....	Agri.	Spec.	Aumsville
Svenson, Lynette Joyce.....	Com.	Fr.	Astoria
Swaggerty, James G.....	M. E.	Soph.	Salem
Swan, Grant.....	C. E.	Fr.	Los Angeles
Swan, Harry T.....	Min.	Soph.	Baker
Swearingen, Winifred.....	H. E.	Fr.	Toledo
Sweeney, Elynore Dorothea.....	Com.	Soph.	Walla Walla, Wash.
Sweeney, Philip Brooks.....	Agri.	Jr.	Walla Walla, Wash.
Tadlock, Marion C.....	Chem. E.	Fr.	Raymond, Wash.
Tait, John David.....	E. E.	Soph.	Corvallis
Tate, Aileen.....	Com.	Spec.	Wasco
Taylor, Frances Beryl.....	Opt.		Hollister, Calif.
Taylor, Fred A.....	Com.	Soph.	Medford
Taylor, Hugh L.....	Agri.	Fr.	Corvallis
Taylor, Gladys Cooke.....	H. E.	Fr.	La Grande
Taylor, Kenneth Somers.....	Agri.	Soph.	Glendale, Calif.
Taylor, Stephen Leonard.....	Agri.	Fr.	San Dimas, Calif.
Teague, Hazel Belle.....	H. E.	Spec.	Pomona, Calif.
Teler, Harry Clarence.....	C. E.	Fr.	Portland
Tensen, Klaus.....	Agri.	Voc.	Ontario
Terada, Yoshio.....	Agri.	Fr.	Honolulu, T. H.
Teutsch, William Leroy.....	Agri.	Soph.	Nyssa
Thayer, Jessie.....	Phar.	Sr.	Rainier

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Thayer, Hugh Otis.....	Agri.	Spec.	Vale
Thomas, Marvin.....	Agri.	Soph.	Alhambra, Calif.
Thomas, Seymour.....	Agri.	Soph.	Denver, Colo.
Thompson, Benjamin Garrison.....	Agri.	Jr.	Shedd
Thompson, Cecil A.....	Agri.	Sr.	Portland
Thompson, Ella Margaret.....	Opt.		Corvallis
Thompson, Hal Emerson.....	Com.	Fr.	Falls City
Thompson, Josephine Sophia.....	Com.	Soph.	Seaside
Thompson, Josephine M.....	Com.	Spec.	Portland
Thompson, Kirk.....	M. E.	Fr.	Portland
Thompson, Leslie Rae.....	M. E.	Fr.	Island City
Thoms, Harold W.....	Min.	Sr.	Scio
Thomson, Stanley Aaron.....	Phar.	Soph.	Junction City
Throne, Thelma Louise.....	H. E.	Fr.	Corvallis
Tilden, Howard.....	M. E.	Fr.	Nehalem
Tilley, George S.....	Agri.	Spec.	Seattle, Wash.
Tilton, Arthur James.....	Agri.	Jr.	Portland
Toliver, Marion Earl.....	Agri.	Fr.	Molalla
Tolls, Leveritt Joseph.....	Com.	Soph.	Portland
Tomkins, Clarence.....	E. E.	Fr.	Corvallis
Towle, Florence.....	H. E.	Fr.	Portland
Townsend, Annie.....	H. E.	Fr.	Corvallis
Tromp, Anna Belle Agnes.....	H. E.	Jr.	Ferndale, Wash.
Truesdale, Charles M.....	Agri.	Jr.	Redlands, Calif.
Turner, Marguerite E.....	Com.	Soph.	Medical Springs
Turner, Maynard Ede.....	Agri.	Fr.	Pasadena, Calif.
Tuthill, Lewis H.....	Hi. E.	Soph.	Sutherlin
Tweed, Catherine.....	H. E.	Jr.	Corvallis
Tyrrel, Claude Alonzo.....	Agri.	Jr.	Alhambra, Calif.
Underwood, Joseph M.....	Min.	Sr.	Pasadena, Calif.
Upcroft, Winfield Scott.....	Com.	Fr.	Vandergrift, Pa.
Ure, Ray Elwin.....	Agri.	Spec.	Portland
U'Ren, Muriel Elizabeth.....	H. E.	Fr.	Portland
Van Hine, Jacob Cornelius.....	Com.	Spec.	Corvallis
Van Luven, Donald E.....	Agri.	Fr.	Colton, Calif.
Vannice, Thomas Keifer.....	I. A.	Soph.	Corvallis
Van Tassel, Harriet.....	Opt.		Albany
Van Winkle, Dorothy Charlotte.....	Com.	Soph.	Spokane, Wash.
Van Wyngarden, Ben.....	Com.	Fr.	Portland
Versteeg, Ray Marion.....	M. E.	Fr.	Portland
Vestal, James Fenix.....	I. A.	Jr.	Eagle Point
Vierhus, Albert Victor.....	Min.	Jr.	Oregon City
Vihari, Ambalal J.....	Com.	Sr.	Baroda, India
Vincent, Hazel Margaret.....	H. E.	Jr.	Vici, Okla.
Von Lehe, Agnes Pauline.....	H. E.	Fr.	Philomath
Von Lehe, Erma Magadeline.....	H. E.	Fr.	Philomath
Voruz, Ruth.....	H. E.	Jr.	Baker
Wade, Ellen Claire.....	Com.	Fr.	Clem
Wade, Wythel.....	H. E.	Fr.	Island City
Wagner, Henrietta.....	H. E.	Sr.	Laurel, Ind.
Wagner, Laura Ethel.....	H. E.	Spec.	Salem

Name	Course	Rank	Home Address
Wait, George N.	I. A.	Fr.	Canby
Waite, Katherine Douglas	Phar.	Jr.	Roseburg
Wakefield, Harold Smith	Agri.	Fr.	Fresno, Calif.
Walker, Ethel Elaine	H. E.	Jr.	Philomath
Walker, James Douglas	Phar.	Fr.	Salem
Walker, Ozbun G.	Com.	Fr.	Portland
Walker, Robert Edwin	Com.	Soph.	Mancos, Colo.
Wall, Millicent	Com.	Fr.	Portland
Walpole, John Kenneth	Agri.	Fr.	Portland
Walsted, John Palmer	Chem. E.	Fr.	Portland
Walter, Glenn Franklin	Com.	Voc.	Portland
Walters, Frances	Com.	Soph.	Corvallis
Ward, Lillian Alice	H. E.	Soph.	Portland
Warman, Grace Anna	H. E.	Spec.	Corvallis
Warnick, Irma A.	Com.	Voc.	Wedderburn
Warrens, Robert Hewett	Agri.	Fr.	Hillsdale
Washburn, Harry Lee	Agri.	Voc.	Washington, D. C.
Watenpugh, Rolland V.	Com.	Jr.	Ontario, Calif.
Waterman, Crawford Burbank	Opt.		Los Angeles, Calif.
Waterman, Ellsworth Yale	Agri.	Fr.	San Leandro, Calif.
Waterman, Whitney	Agri.	Jr.	Pasadena, Calif.
Watkins, Harold H.	Agri.	Fr.	Kalama, Wash.
Watt, Bertha J.	Com.	Fr.	Portland
Watt, Robert Henry	Agri.	Soph.	Bay City
Watson, Margaret B.	Com.	Fr.	Corvallis
Watson, Stanley Everett	Min.	Fr.	Hillsboro
Waugh, Robert Walter	C. E.	Fr.	Hood River
Weatherspoon, Froma B.	H. E.	Voc.	Elgin
Webber, Charles H.	Agri.	Fr.	Portland
Weber, Georgia Muriel	H. E.	Fr.	Halsey
Weber, Richard M.	Agri.	Jr.	Hood River
Webster, Earl	Agri.	Soph.	Portland
Webster, Robert Millard	I. E.	Soph.	Milford, Utah
Weed, Wilbur M.	Agri.	Fr.	Beaverton
Weidenheimer, Norman William	Min.	Fr.	Corvallis
Weisenborn, Henry William	Com.	Fr.	Portland
Weller, George C.	C. E.	Fr.	Salem
Wellman, Harrison Richard	M. E.	Soph.	Freewater
Wells, Lizzie	Com.	Sp.	Buena Vista
Wells, Orville George	Agri.	Fr.	Independence
Wells, Theodosia Violet	Com.	Fr.	Ontario
Werth, Conrad Walter	E. E.	Sr.	Portland
West, A. Flavius	Com.	Soph.	Portland
West, George G.	C. E.	Fr.	Portland
West, Marion Lou	H. E.	Soph.	Portland
Westgate, Alfred Marion	Com.	Voc.	Pilot Rock
Whaley, Mamie	H. E.	Spec.	Corvallis
Wheeler, Ethel Cusick	H. E.	Fr.	Portland
Wheeler, Eva May	H. E.	Soph.	Tillamook
Wheeler, Helen Pierce	H. E.	Soph.	Portland
Whillock, Bertha Alice	Com.	Sr.	Medford

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Whipple, Hazel.....	Com.	Fr.	Corvallis
Whitaker, Leslie C.....	Agri.	Jr.	Sacramento, Calif.
Whitaker, Richard M.....	Agri.	Spec.	Seaside
Whitaker, William Carey.....	Agri.	Fr.	Sacramento, Calif.
White, Harold H.....	Agri.	Soph.	Kerby
Whitmore, Rodney M.....	Com.	Spec.	Mayfield, Pa.
Whitted, Floyd C.....	Phar.	Fr.	San Dimas, Calif.
Whittlesey, Roland D.....	Min.	Fr.	Philomath
Widby, Arthur B.....	Agri.	Fr.	Myrtle Point
Wieman, John Samuel.....	Agri.	Sr.	Los Angeles, Calif.
Wilber, Howard Earl.....	Agri.	Soph.	Long Beach, Calif.
Wilde, Cora.....	Com.	Soph.	Junction City
Wiles, Clarence E.....	Agri.	Fr.	Albany
Wilhelm, Roger Jesse.....	Phar.	Spec.	The Dalles
Wilkes, Elinor.....	Opt.		Corvallis
Wilks, L. Raymond.....	Agri.	Soph.	Helix
Willert, Floyd B.....	For.	Fr.	Corvallis
Willoughby, Ralph S.....	Agri.	Soph.	Harrisburg
Wilmot, Richard K.....	For.	Sr.	Portland
Wilt, Clarence Oliver.....	M. E.	Fr.	Corvallis
Williams, Carl Alfred.....	Com.	Soph.	Alpine
Williams, Charles Walter.....	Agri.	Jr.	Corvallis
Williams, E. Dan.....	Log. E.	Fr.	Portland
Williams, James Wayne.....	Log. E.	Soph.	Portland
Williams, Richard C.....	Agri.	Sr.	Hillsboro
Williams, Richard Hipsley.....	Agri.	Jr.	Dillon, Mont.
Williams, Sumner W.....	For.	Soph.	Glendale
Williams, Wendell.....	Agri.	Voc.	Junction City
Williamson, Fred Nelson.....	Agri.	Fr.	Yachats
Williamson, Loma Emma.....	H. E.	Soph.	Corvallis
Williamson, Martha Jane.....	H. E.	Jr.	Corvallis
Wilson, Ernest Hester.....	E. E.	Fr.	The Dalles
Wilson, Frank Edwin.....	C. E.	Fr.	Mosier
Wilson, Otis Estee.....	M. E.	Jr.	Salem
Wilson, Stella Nora.....	H. E.	Jr.	Burns
Winter, T. A.....	Agri.	Jr.	Los Angeles, Calif.
Wise, Zena Alex.....	M. E.	Fr.	Portland
Wiseman, Daisy Evolene.....	H. E.	Soph.	Huston, Texas
Wiseman, Edna Mary.....	Com.	Spec.	Naches, Wash.
Wissinger, Dorothy S.....	Com.	Fr.	Milwaukie
Witt, Eric William.....	Agri.	Soph.	Portland
Wittliff, John Allen.....	E. E.	Fr.	The Dalles
Wolff, Ruth E.....	Phar.	Fr.	Portland
Wood, LeVelle.....	H. E.	Fr.	Corvallis
Wood, Rowena Adelaide.....	Opt.		Arlington
Woodcock, Arthur James.....	Phar.	Sr.	Portland
Woodham, Edna Clara.....	H. E.	Voc.	Corvallis
Woodham, Harry C.....	Agri.	Spec.	Albion, Ill.
Woodsum, Edna May.....	H. E.	Jr.	Corvallis
Woodward, Mary.....	H. E.	Fr.	Portland
Worley, Stanley.....	Agri.	Sr.	San Francisco, Calif.

Name	Course	Rank	Home Address
Wright, Blanche Ellen.....	H. E.	Soph.	Brownsville
Wright, Gill Cowan.....	Agri.	Spec.	Richland
Wright, Marshall Simpson.....	Agri.	Jr.	Sierra Madre, Calif.
Wright, William SoRelle.....	Agri.	Sr.	San Gabriel, Calif.
Yamamota, Francis Y.....	E. E.	Sr.	Seattle, Wash.
Yates, Eva.....	H. E.	Sr.	Corvallis
Yates, Irma.....	Com.	Fr.	Corvallis
Yeatman, Irene Estelle.....	H. E.	Soph.	Oakland, Calif.
Yexley, Lyle Marion.....	H. E.	Fr.	Oregon City
Yexley, Myrtle Allen.....	H. E.	Fr.	Oregon City
Young, Garth Lylle.....	M. E.	Fr.	Portland
Young, Hubbell.....	Agri.	Spec.	Tangent
Young, William John.....	M. E.	Fr.	Portland
Young, William Nelson.....	Agri.	Fr.	Seattle
Zan, Regina.....	H. E.	Spec.	Portland
Ziegler, E. Augusta.....	Com.	Fr.	Portland
Ziegler, Helen Marie.....	H. E.	Jr.	White Salmon, Wash.
Ziegler, Laura Elizabeth.....	Phar.	Jr.	White Salmon, Wash.
Zimmerhahle, Frank.....	I. A.	Fr.	Clatskanie

SUMMER SCHOOL STUDENTS

Absher, Albert	I. A.	Corvallis
Adams, M. Etta	H. E.	Corvallis
Ahnert, Mollie	Coll.	Eagle Creek
Alder, Frank William	I. A.	Oakland, Calif.
Alexander, Marjorie	H. E.	Salem
Alexander, Ruby	H. E.	McMinnville
Allinger, H. W.	Coll.	The Dalles
Amesbury, Ruth	H. E.	Portland
Amonino, Anthony B.	I. A.	Negaunee, Mich.
Anderson, Ellen	H. E.	Portland
Andrews, Abbie	H. E.	Corvallis
Andrews, Marguerite	Phys. Ed.	Corvallis
Andrews, Marie	Com.	Corvallis
Anthony, Marie	H. E.	Albany
Ariss, Dorothy	H. E.	Portland
Axtell, Edward G.	I. A.	Corvallis
Bair, Ray Elman	I. A.	Fossil
Banton, Lillian Louella	Music	Bellfountain
BaRee, Edith A.	H. E.	Eugene
Bartlett, Ellen M.	Spec.	San Francisco, Calif.
Bechen, Ella	Phys. Ed.	Hillsboro
Bechen, Esther	Phys. Ed.	Hillsboro
Bechen, Martha	H. E.	Hillsboro
Beers, Ruby	H. E.	Corvallis
Benson, Mrs. Orpah	H. E.	Cottage Grove
Berchtold, Florence	Music	Corvallis
Betterson, Mrs. Sophia W.	H. E.	Portland
Biddle, Gladys	H. E.	LaFayette
Birch, Garcia	H. E.	Corvallis
Black, Verena	H. E.	Eugene
Boies, Isaac	Spec.	Regina, Canada
Booth, Bertha M.	H. E.	Madras
Bowden, Florence	Phys. Ed.	Corvallis
Bowerman, Mrs. E.	Coll.	Fossil
Bradley, Pearl	H. E.	Corvallis
Bruce, Louise	Phys. Ed.	Portland
Brumbaugh, Madeline	Com.	Corvallis
Buchanan, Fred H.	I. A.	McMinnville
Buell, Bartholomew	Coll.	Corvallis
Burnap, Florence	H. E.	Corvallis
Burton, Mrs.	Music	Corvallis
Caldwell, Katharine	H. E.	Artesia, Calif.
Carlson, Arthur A.	I. A.	Portland
Case, Ruth E.	Coll.	Kalama, Wash.
Castle, Carrie E.	H. E.	Berkeley, Calif.
Chalker, Mrs. Estella	H. E.	Portland
Childs, Grace	H. E.	Redlands, Calif.
Chute, Freeman G.	I. A.	Bellingham, Wash.
Chute, Mrs. F. G.	H. E.	Bellingham, Wash.

Name	Course	Home Address
Clark, Doris A.	Coll.	Portland
Clausmeyer, Blanch M.	Phys. Ed.	Corvallis
Cochrane, Adona	Coll.	Salem
Cochrane, Isabelle	Com.	Corvallis
Cofer, Effie E.	Coll.	Corvallis
Coffman, Orville W.	Spec.	Pendleton
Cohoon, W. C.	Coll.	Hood River
Cooper, Altha	Coll.	Corvallis
Corbett, Jessie	H. E.	Corvallis
Corbett, Ruth	Spec.	Corvallis
Covell, Margaret	Art	Corvallis
Cramer, Rae L.	Music	Corvallis
Cunningham, Bessie A.	Phys. Ed.	Woodburn
Curriu, Linnie E.	H. E.	Corvallis
Daugherty, Otis Ray	Spec.	Molalla
Dawson, Anna	Coll.	Albany
Deming, Edna	H. E.	Healdsburg, Calif.
Deierlein, Gertrude	H. E.	Eugene
Denniston, Audrey	Com.	McMinnville
Denniston, Laneta	H. E.	McMinnville
Dietsch, F. J.	Spec.	Days Creek
Dillon, Martha E.	Coll.	Portland
Doolittle, Lydia	H. E.	Corvallis
Doolittle, Maida E.	Coll.	Wallowa
Dougherty, Avis F.	Coll.	Portland
Dyson, Lizzie	Coll.	Dahlia, Wash.
Eagy, Clarence H.	Com.	Albany
Eakins, Jack M.	Com.	South Pasadena, Calif.
Edwards, Bertha M.	H. E.	Monroe
Empo, Estella	Coll.	Blind Slough
Ericson, L. J.	I. A.	Bellingham, Wash.
Ericson, Mrs. L. J.	H. E.	Corvallis
Everton, Ada	Com.	Grants Pass
Fawcett, Hazel	Coll.	Coquille
Fegley, Pearl S.	Coll.	Corvallis
Feike, Zelta F.	H. E.	Portland
Ferguson, Alice	Coll.	Helix
Fiedler, Elizabeth	Coll.	Corvallis
Fischer, W. C.	Spec.	Yaquina
Flint, Mrs. Marie A.	H. E.	Roseburg
Forest, Bernice	H. E.	Eugene
Fox, Otto L.	I. A.	Albany
Freyler, Edna	Com.	Corvallis
Fridley, Dora A.	Coll.	Klondike
Fulton, Helen Louise	Art	Corvallis
Funk, Vera	Com.	Corvallis
Gardner, Helen	Coll.	Metzger
Gartin, L. E.	Spec.	Portland
Gates, Pearl	H. E.	Corvallis
Gilmore, Mrs. W. J.	Coll.	Corvallis
Glines, Ione	H. E.	Waldport

Name	Course	Home Address
Glaser, Elizabeth	H. E.	Lebanon
Goble, R. E.	I. A.	Ferndale, Calif.
Golden, Zoe	H. E.	Corvallis
Gould, Lois	Phys. Ed.	Corvallis
Gray, Mattie E.	H. E.	Corvallis
Guthrie, Jane	Coll.	Corvallis
Hall, George J.	Coll.	Cottage Grove
Hall, Mildred A.	Com.	Corvallis
Hall, Phila H.	H. E.	Fairfax, Vermont
Hammond, Josephine	Coll.	Silverton
Hanthorn, Faith	Coll.	Portland
Hardie, Jessie M.	I. A.	Condon
Hargrove, Vivian	Coll.	Corvallis
Harris, Edna	Coll.	Fruitland, Idaho
Harrison, Allen	I. A.	Brownsville
Harrison, Evandne	Coll.	Portland
Hazelton, Blanche M.	Coll.	Amesbury, Mass.
Hedlund, Clara	H. E.	Portland
Hequidt, G. B.	Spec.	Portland
Heller, Anna E.	H. E.	Spokane, Wash.
Hembling, Grace	Com.	Corvallis
Hicks, Hazel Ione	Coll.	Weiser, Idaho
Hicks, Roy A.	I. A.	San Jose, Calif.
Hilde, Tillie	Coll.	Fort Ranson, N. D.
Hill, Glenn H.	I. A.	Santa Clara, Calif.
Holway, Alma C.	H. E.	Portland
Holway, Charles	I. A.	Portland
Homes, Susan W.	H. E.	Ashland
Hopkins, Ethel	Coll.	Corvallis
Horner, Pearl	H. E.	Corvallis
Houck, E. L.	Spec.	McMinnville
Howard, Mrs. R. M.	H. E.	Corvallis
Howey, Iva M.	Coll.	Corvallis
Hurd, G. Lansing	Spec.	Portland
Hurd, Sylvia Belle	Coll.	Medford
Jackson, Eva I.	H. E.	Portland
Jackson, Mildred M.	Coll.	Corvallis
Jewett, Howard P.	Coll.	Salem
Johnson, Ruth A.	Coll.	Astoria
Johnston, Jane Agnes	H. E.	Corvallis
Jones, Edith	Coll.	Lynn, Ind.
Jones, Margaret	Phys. Ed.	Corvallis
Jordon, Marvin	I. A.	Corvallis
Joseph, Retta E.	Com.	Philomath
Kalbus, Helen	Coll.	Chehalis, Wash.
Kellogg, C. M.	Spec.	Corvallis
Kennard, Bess	Coll.	Santa Rosa, Calif.
Kennard, Ella	Coll.	Santa Rosa, Calif.
Kennedy, Ruth	Coll.	Corvallis
Kenny, Dora	Coll.	Portland
Kimmall, Walter Wm.	I. A.	Lebanon

Name	Course	Home Address
Kirtley, Naomi	H. E.	La Grande
Klann, Ethel	H. E.	Madras
Knight, Frederick S.	Coll.	Forest Grove
Knowles, Inez	H. E.	Lebanon
Lamson, Maude E.	H. E.	Cottage Grove
Law, Mary Ellen	Coll.	Corvallis
Leeper, Enid	Coll.	Corvallis
Legge, Gladys	Coll.	Portland
Leland, A. E.	Spec.	Los Angeles, Calif.
Lent, May	H. E.	Spokane, Wash.
Lewis, Adele	Coll.	Corvallis
Lewis, J. M.	Coll.	Corvallis
Lindsay, Anne	H. E.	Corvallis
Lindsay, Edith	Coll.	Corvallis
Linville, Myrtle	Coll.	Astoria
Loftus, Wilhelmina	H. E.	Seattle
Love, Anis	Coll.	Junction City
Lundgren, Alice	H. E.	Corvallis
Lusian, Edith J.	H. E.	Spokane, Wash.
McAlroy, George Ernest	I. A.	Dixon, Calif.
McBride, Mildred	Coll.	Corvallis
McCain, Isle	H. E.	Jordan Valley
McClain, Oral	Com.	Salem
McCormick, Anna	H. E.	Lebanon
McCormick, H. C.	Coll.	Corvallis
McDonnell, Alice	Coll.	Jordan Valley
McDougal, Clyde	Coll.	Corvallis
McKibbin, Jennie	Coll.	Portland
McNeal, R. W.	Coll.	Corvallis
MacDonald, Helen	Meth.	Corvallis
Mack, Lawrence Wallace	I. A.	Dufur
Maginnis, Agnes J.	Coll.	Corvallis
Maginnis, Frances	Coll.	Corvallis
Marias, Jos. F.	Spec.	Astoria
Matheny, June	Art	Seattle, Wash.
May, Lulu	Coll.	Monkland
Meacham, Leta	H. E.	Weiser, Idaho
Mendenhall, Marie	H. E.	Everett, Wash.
Mentzer, Lottie	Spec.	Pendleton
Mettie, Zena	I. A.	Ukiah
Miller, Alice Ruth	H. E.	Corvallis
Miller, C. Eva	H. E.	Corvallis
Miller, Mrs. Ellen	H. E.	Portland
Miller, Emily M.	Coll.	Corvallis
Mitchell, Grace	H. E.	Medford
Moore, Genevieve	Phys. Ed.	Corvallis
Moore, Iva Grace	Com.	Corvallis
Moore, Myra	H. E.	Corvallis
Moore, Sam	Spec.	Corvallis
Morarity, May C.	Coll.	Portland
Morris, Blanche	H. E.	Tennant, Iowa

Name	Course	Home Address
Morrison, Ruth	Coll.	Hood River
Morton, Ruth	H. E.	White Salmon, Wash.
Munson, Robert Bliss	Coll.	Corvallis
Murphy, C. May	Coll.	Portland
Myers, Eva T.	Coll.	Winlock, Wash.
Nelson, Bessie A.	Coll.	Portland
Nelson, Charlotte Lewis	H. E.	Corvallis
Niblin, Amy	H. E.	Caldwell, Idaho.
Nichols, Ambrose R.	Spec.	Corvallis
Nichols, Ben H.	Com.	Corvallis
Nichols, Margaret	H. E.	Portland
Nisley, Barbara	Coll.	Portland
Norris, Rita	H. E.	Burley, Idaho
Norton, Lola	H. E.	Vacaville, Calif.
Norton, Mabel	H. E.	Vacaville, Calif.
Nunn, Jess	Com.	Corvallis
Nunn, Vera A.	H. E.	Corvallis
Olsen, Mette	H. E.	Eugene
Paine, Chas. L.	Com.	Caldwell, Idaho
Paine, Mary A.	H. E.	Caldwell, Idaho
Parker, Lorena A.	H. E.	Oregon City
Patton, Palmer	Coll.	Corvallis
Paterson, James L.	Spec.	Portland
Patey, Alice L.	H. E.	McMinnville
Patterson, Winfred E.	H. E.	Corvallis
Peterson, Ivy	Coll.	Beaverton
Pernot, Dorothy	Phys. Ed.	Corvallis
Pimm, Alice	Coll.	Philomath
Porter, Chas. E.	Spec.	Portland
Post, Velma B.	Coll.	Blachly
Potter, Marion K.	H. E.	Corvallis
Powell, W. S.	Spec.	Moro
Powers, Verne L.	Phys. Ed.	Corvallis
Prentiss, Sara	H. E.	Bay City
Price, Elise Groves	H. E.	Sifton, Wash.
Randall, Frank I.	Spec.	Portland
Rausch, Mary I.	Spec.	Seattle, Wash.
Redmond, Agnes	H. E.	Portland
Reed, Ada	H. E.	Portland
Reeves, Orville G.	I. A.	Corvallis
Reichart, Natalie	Coll.	Corvallis
Reiter, Mrs. Eva C.	Spec.	Corvallis
Ressler, Mrs. May Babbitt	Phys. Ed.	Corvallis
Rice, Gladys	Coll.	Corvallis
Richards, Lorena	H. E.	Corvallis
Rieben, George	I. A.	Banks
Rieben, Mrs. George	Phys. Ed.	Ferndale, Calif.
Robbins, G. W.	I. A.	Corvallis
Robertson, Etta	Phys. Ed.	Corvallis
Robey, Donald Leroy	Coll.	Eugene
Robinson, Edward	I. A.	Salem

Name	Course	Home Address
Rogers, Mary	H. E.	Corvallis
Row, A. N.	Coll.	Corvallis
Rugh, Irene	Coll.	Eugene
Ryder, Agnes	Coll.	Eugene
Samson, Mrs. Geo. R.	H. E.	Corvallis
Sanders, Frances	Com.	Moro
Sarna, S. S.	Com.	Corvallis
Sawyer, Doris M.	H. E.	Salem
Schott, Rena	H. E.	Salem
Schoeffel, Raymond L.	I. A.	Los Angeles, Calif.
Schrepel, Marie F.	Com.	Corvallis
Scott, Jennie	Phys. Ed.	Corvallis
Scott, Mary	Phys. Ed.	Corvallis
Searcy, Lula E.	Coll.	Condon
Settles, Miss O.	H. E.	Redlands, Calif.
Sexton, Ellen E.	H. E.	Stewart, Nev.
Shankland, Albert	I. A.	Kalispell, Mont.
Shattuck, Mrs.	Phys. Ed.	Corvallis
Shedd, Lucile	H. E.	Shedd
Shelley, Marjorie	H. E.	Everett, Wash.
Shelley, Nellie	I. A.	Merlin
Sherman, Mrs. E. D.	Coll.	Fargo, N. D.
Shrock, Fannye	H. E.	Spokane, Wash.
Shrode, Jettie	Coll.	Albany
Sias, Mary	Spec.	Forest Grove
Siemon, Lydia	H. E.	Bakersfield, Calif.
Simpson, Dorothy P.	H. E.	Corvallis
Skidmore, Maude	H. E.	Curtin
Skipton, Laurence	Com.	Corvallis
Slade, Beulah	Com.	Moscow, Idaho
Smith, Beryl	I. A.	San Jose, Calif.
Smith, Elva L.	Coll.	Portland
Smith, Grace	Phys. Ed.	Corvallis
Smith, J. W.	Spec.	Corvallis
Spalding, Anna	H. E.	Oakland, Calif.
Starr, Edna M.	Com.	Bandon
Starr, Wilda	Art	Floweree, Mont.
Stuart, George A.	Com.	Latourell Falls
Stewart, Ruth	Coll.	Portland
Stoneburg, Ada Ruth	H. E.	Corvallis
Stow, Mrs. Emma	H. E.	Corvallis
Stow, William R.	Coll.	Corvallis
Stowell, Mrs. G. E.	H. E.	Corvallis
Streiff, Rosine	H. E.	Hillsdale
Struble, Frank H.	I. A.	Corvallis
Swanton, Frank	Spec.	Astoria
Sykes, Nell	H. E.	Salem
Tamminen, Leander	I. A.	Portland
Taylor, Bessie E.	H. E.	Fargo, N. D.
Thayer, Jessie	H. E.	Rainier
Thompson, Ben G.	Coll.	Corvallis

Name	Course	Home Address
Thompson, Levant	I. A.	Regina, Canada
Turner, Arthur E.	I. A.	Corvallis
Turner, A. L.	H. E.	Centralia, Wash.
Turner, Winnifred	H. E.	Corvallis
Uddenberg, Aide	H. E.	Tacoma, Wash.
Vail, Nathan D.	Spec.	Seattle, Wash.
Vierhus, Mary	I. A.	Oregon City
Vincent, Hazel	H. E.	Mutual, Okla.
Virgil, Fannie E.	H. E.	Klamath Falls
Wagener, Jessie	Coll.	Portland
Wagner, Henrietta	H. E.	Laurel, Ind.
Warne, Clyde S.	I. A.	San Jose, Calif.
Weisenborn, Anna	H. E.	Portland
Weymouth, Blanche	Com.	San Francisco, Calif.
Wight, Howard M.	Coll.	Corvallis
Wildig, Sophia	H. E.	Corvallis
Wilkes, Elinor	Phys. Ed.	Corvallis
Williamson, D. N.	Spec.	Corvallis
Williamson, Loma	Art	Corvallis
Williamson, Martha	Coll.	Corvallis
Wiseman, Mrs. Edna	H. E.	North Yakima, Wash.
Withee, Mabel	I. A.	Jacksonville
Woollomes, Agnes	H. E.	Whittier, Calif.
Workinger, May	Phys. Ed.	Corvallis
Yates, Eva	Coll.	Corvallis

SPECIAL MUSIC STUDENTS *

Name	Course	Home Address
Adams, Clara Elizabeth	Harmony	Corvallis
Ahern, Ierene	Piano	Hugo
Allen, Mrs. L. J.	Piano	Corvallis
Bates, Margaret Kathryn	Piano	Corvallis
Bauer, Marian	Piano	Corvallis
Bedyink, John	Violin	Corvallis
Brumbaugh, Sheldon	Voice	Corvallis
Casteel, Edith Hazel	Voice	Yaquonia
Chambers, Bernice	Piano	Corvallis
Chambers, Paul King	Clarinet	Corvallis
Churchill, Frances M.	Voice	Corvallis
Cordley, Dorothea	Voice	Corvallis
Dallas, Ruey	Piano	Corvallis
Fisher, Mrs. Gertrude	Voice	Philomath
Fitts, Grace	Piano	Lebanon
Foster, Ada	Piano	Corvallis
Fox, Otto L.	Trombone	Albany
Fryder, Helen	Saxaphone	Corvallis

* In addition the names listed here, approximately 200 regular students of the College whose names are listed elsewhere in the Catalogue took work in the School of Music.

Name	Course	Home Address
Gilmore, Faith	Voice	Corvallis
Goodman, Arlene Garratt	Piano	Corvallis
Graham, Willa	Saxaphone	Corvallis
Hall, Lester E.	Voice	Corvallis
Hall, Mildred A.	Piano	Corvallis
Hamlin, Lucile	Voice	Corvallis
Hanshaw, Aura	Violin	Corvallis
Hawk, Ira Ross	Piano	Corvallis
Heitmeyer, Paul	Piano	Albany
Hereth, Conrad	Voice	Corvallis
Jager, Ernest Erwin	Piano	Corvallis
Johnson, Orlo	Trombone	Corvallis
Kamrolz, Mrs. H. E.	Voice	Centerville, Wash.
Kerr, Marion	Violin	Corvallis
Kiger, Martha	Piano	Corvallis
Krueger, Clara M.	Piano	Corvallis
Kuhlman, Mrs.	Voice	Corvallis
McCoy, Harold A.	Trombone	Oakdale, Wash.
Patterson, Dean Joseph	Clarinet	Corvallis
Peil, Fay Elizabeth	Piano	Corvallis
Reid, Ronald Baltimore	Piano	Albany
Rosenbaum, Lydia	Piano	Philomath
Shattuck, Obil	Saxaphone	Corvallis
Smith, Eleanor	Piano	Corvallis
Smith, Mrs. Mason	Violin	Corvallis
Turner, Milo F.	Cornet	Corvallis
Vickers, Mrs. Louise M.	Piano	Corvallis
Watkins, Mrs.	Piano	Philomath
Whittemore, Hopewell	Piano and Violin	Corvallis
Whittemore, John	Piano and Clarinet	Corvallis

WINTER SHORT COURSE STUDENTS (1918)

Name	Home Address	Name	Home Address
Adams, Mrs. M. Alice.....	Corvallis	Krueger, E. A.....	Corvallis
Allen, Mrs. L. J.....	Corvallis	Lockwood, John.....	Cloverdale
Bell, Mrs. R. W.....	Corvallis	Lorenzen, Anna.....	Pendleton
Bennett, R. R.....	Gravel Ford	Lorenzen, Leona.....	Pendleton
Bennett, Mrs. R. R.....	Gravel Ford	McMaster, Marion E.....	Corvallis
Bjelland, Lars.....	Parma, Idaho	McMorris, Mabel.....	Condon
Booster, J. Howard.....	Woodburn	MacGregor, Mrs. L. P.....	Dallas
Boothby, Mrs. Lilly M....	Corvallis	Mayse, Lester.....	Dora
Brennan, John A.....	Coquille	Meyer, Oscar.....	Salem
Brenner, Cleo Forrest.....	Ione	Miller, Alice.....	Corvallis
Breyman, Mrs. A. C.....	Portland	Miller, J. E.....	Corvallis
Briggs, Mrs. A. L.....	Corvallis	Minnard, Willis.....	Heppner
Brown, A. R.....	Centerville, Wash.	Mosby, David C.....	Cottage Grove
Brown, J. R.....	North Bend	Nagel, Viola.....	Gaston
Brumbaugh, Mrs. Nana...	Corvallis	Nolan, John.....	Ione
Bullis, Mrs. D. E.....	Corvallis	Novalla, Leo.....	The Dalles
Callahan, Emmett.....	Boardman	Nunn, Henry.....	Corvallis
Cannon, Mrs. R. E.....	Corvallis	Olsen, Christian.....	Mt. Angel
Cate, Vernon.....	Tangent	Olsen, Rudolph.....	Oswego
Chapel, Mrs. F. N.....	Portland	Palmer, Beatrice.....	Canada
Chirgwin, H. Stanley.....	Medford	Patten, Harrison I.....	Hillsboro
Chladek, George.....	Lebanon	Patten, John D.....	Corvallis

WINTER SHORT COURSE STUDENTS

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Name	Home Address	Name	Home Address
Clark, Mrs. Maude T.....	Portland	Pelko, A.....	Glenn, Calif.
Clarke, W. W.....	Parkdale	Phelps, Chas. W.....	Corvallis
Clausen, Mrs. F. C.....	Corvallis	Powell, Delma.....	Corvallis
Coon, Mrs. G. B.....	Corvallis	Roberts, Eldon K.....	Independence
Creson, Frank A.....	Hood River	Roberts, Mrs. Lina.....	Corvallis
Deckebach, Frederick.....	Salem	Robinson, Mrs. R. H.....	Salem
Dewell, Mrs. Bernice.....	Corvallis	Rogers, Margaret...San Francisco,	
Dickinson, Arthur L.....	Corvallis		Calif.
Ditsworth, Stewart.....	Derby	Rohoe, Elsie.....	Echo
Donohue, R. J.....	Olympia, Wash.	Schaad, Ruth.....	Newberg
Donohue, Mrs. R. J.....	Olympia, Wash.	Schenck, Robert E.....	Medford
Durflinger, Harry.....	Coburg	Schick, Mrs. A.....	Corvallis
Erickson, Atlee.....	Estacada	Schmidt, Martha.....	Corvallis
Farmer, Hugh G.....	McMinnville	Schubarth, Florette.....	Corvallis
Farra, George R.....	Corvallis	Seymour, Mrs. H. C.....	Corvallis
Glaze, Vena C.....	Corvallis	Shibley, E. W.....	Estacada
Granby, Alva.....	Marshfield	Smith, William W.....	Portland
Grasly, Leonard.....	Langlois	Stinnett, Russell T.....	Ashland
Hall, Willis Edgar.....	Gaston	Stephens, John H.....	Dilley
Hand, Mrs. Maude E.....	Corvallis	Stevenson, A. L.....	Corvallis
Hay, Leila.....	Corvallis	Stevenson, Mrs. A. L.....	Corvallis
Heeszel, Frieda.....	Corvallis	Tarwater, Edward A.....	Corvallis
Hembling, Grace.....	Corvallis	Taylor, Stanley.....	Shelburn
Hereth, C.....	Corvallis	Tinker, Geo. H., Jr.....	Seattle, Wash.
Irwin, Princess.....	Granville, N. D.	Tolleshaug, M. K.....	Rainier
Johnner, Gunner....	Manette, Wash.	Turner, Jasper.....	Gold Beach
Kamholz, H. E....	Centerville, Wash.	Ulrich, Herman B.....	Airlie
Kamholz, Mrs. H. E....	Centerville,	Vana, G. W.....	Crabtree
	Wash.	Vaughan, Uriah.....	Derby
Kent, W. J.....	Corvallis	Vickers, Mrs. H. A.....	Corvallis
Kjelland, L. A....	Valley City, N. D.	Wallis, William E.....	Albany
Krause, Gustav.....	Cornelius	White, Orval D.....	Monmouth
Krueger, Clara M.....	Corvallis		

NOTE.—In addition to the above listed names, out of a total of 1345 students registered in the Farmers' Week and in the special short Resident courses, the names of 1306 students who were registered in these courses but in no other College courses, do not appear.

SENIOR HONOR STUDENTS

Senior honors are conferred by the College Council upon those members of the graduating class who have maintained throughout their entire college course the highest scholastic standing in their department. No student is eligible to this honor unless his general average for all subjects has been eighty-five percent or higher. Election is limited to ten percent of the graduating members of a department.

SELECTION FOR JUNE 1917**AGRICULTURE**

Vernon Basler

Claude Clark Calkins

Maurice Jernstedt

Leon Kilby Jones

Ralph William Lowry

Alice Moore

Andrew Edward Murneek

COMMERCE

Winfried Bernard Arens

Margaret Genevieve Frazier

ENGINEERING

John Carlyle Boone

Milton Harris

Robert Franklin Throne

Albrecht Streiff

FORESTRY AND LOGGING**ENGINEERING**

Clarence Joseph Budelier

Carl Charles Jacoby

HOME ECONOMICS

Martha Henrietta Bechen

Lillian Mildred Imrie

Grace Kinnison

Sara Watt Prentiss

Lois Dorothy Wright

MINES

Deloss Everett Bullis

FORENSIC HONOR ROLL FOR 1916-17**INTERCOLLEGIATE ORATOR**

Glen Beagle

INTERCOLLEGIATE DEBATORS

Elvin Winfield McMIndes

William Bernard Mainwaring

Robert Roy Reichart

Vernon Basler

CHAMPION INTERCLASS ORATOR

Ernest Koch Willer

CHAMPION IN INTERCLASS DEBATE

Theodore Cramer

Archer Olin Leech

Elvin Winfield McMIndes

WINNER OF SHAKOPEAN CUP

Robert Ray Reichart

Awarded annually to the member of the senior class
having the best record in forensics for
the whole College course.

CLARA H. WALDO PRIZES

The Clara H. Waldo Prizes are awarded on a basis of both scholarship and general achievement as follows: (a) Proficiency in literary and scholastic attainments; (b) Success in student activities; (c) Qualities of womanhood; (d) Qualities of leadership. The selection is made by a joint arrangement between faculty and students. To the senior woman selected, a prize of forty dollars is awarded; to the junior woman, thirty dollars; to the sophomore woman, twenty dollars; and to the freshman woman, ten dollars. Students receiving second and third place in each class are given Honorable Mention.

SELECTIONS FOR JUNE 1917^a

SENIORS

Helen MacDonald, Corvallis, Benton
Martha Bechen, Hillsboro, Washington
Grace Kinnison, Charleston, Missouri

JUNIORS

Ruth Kelly, Portland, Multnomah
Katherine Howells, Medford, Jackson
Doris Clark, Portland, Multnomah

SOPHOMORES

Christine Abbott, Roseburg, Douglas
Ruth Kennedy, Corvallis, Benton
Claire Carter, Aberdeen, Washington State

FRESHMEN

Hazel Smith, Hood River, Hood River
Margaret Covell, Corvallis, Benton
Elizabeth Richardson, Portland, Multnomah

SUMMARIES *

CLASSIFIED AS TO COURSE

(All Duplicates Excluded)

Course	Men	Women	Total
Agriculture	419	6	425
Home Economics		413	413
Forestry	53	1	54
Logging Engineering	6		6
Engineering and Industrial Arts.....	247	1	248
Mining	41		41
Chemical Engineering	30		30
Commerce	112	186	298
Pharmacy	44	24	68
Optional	3	24	27
Music	16	42	58
Summer School	96	268	364
Apple Packers' Course.....	2	8	10
Pruning Course	23		23
Farmers' Week	838	401	1239
Winter Short Courses	64	43	107
Radio and Buzzer.....	42		42
Totals	2036	1417	3453**

* The enrollment statistics include only those who have pursued work at the College; correspondence students are omitted.

** Total to and including May 15, 1918.

CLASSIFIED AS TO RESIDENCE

(All Duplicates Excluded)

States and Territories:		Ohio		12
Oregon	2896	Oklahoma		3
Alaska	1	Pennsylvania		6
Arizona	1	Philippine Islands		3
California	188	South Dakota		5
Colorado	6	Texas		1
District of Columbia.....	3	Utah		2
Hawaii	2	Vermont		1
Idaho	56	Washington		148
Illinois	9	Wisconsin		4
Indiana	7	Wyoming		2
Iowa	4			527
Kansas	8			
Massachusetts	1			
Michigan	6	Foreign Countries:		
Minnesota	4	Canada	15	
Missouri	2	China	5	
Montana	17	India	4	
Nebraska	5	Ireland	1	
Nevada	2	Scotland	1	
New Hampshire	2	South America.....	1	
New York	6	Sweden	2	
North Carolina	1	Turkey	1	30
North Dakota	9			
		Net total		3453

COMPARATIVE ENROLLMENT

1888-1889	97	1903-1904	530
1889-1890	151	1904-1905	680
1890-1891	201	1905-1906	735
1891-1892	208	1906-1907	833
1892-1893	282	1907-1908	1156
1893-1894	240	1908-1909	1352
1894-1895	261	1909-1910	1591
1895-1896	397	1910-1911	1778
1896-1897	316	1911-1912	2868
1897-1898	336	1912-1913	2314
1898-1899	388	1913-1914	2435
1899-1900	405	1914-1915	4176
1900-1901	436	1915-1916*	3251
1901-1902	448	1916-1917†	3797
1902-1903	541	1917-1918§	3453

The great difference in the total enrollment for the two years, 1910-11 and 1911-12, was due largely to the increase in the number of students registered for the winter short courses in Agriculture. The increase in the number of regular students in the 36-weeks courses was 24 percent.

The decrease in the number of students in 1912-13 from the year 1911-12 is due to the decrease in the short course registration. The increase in the number of regular students in the 36-weeks courses was 19 percent.

* Totals to and including March 16, 1916.

† Totals to and including April 25, 1917.

§ Totals to and including April 8, 1918.

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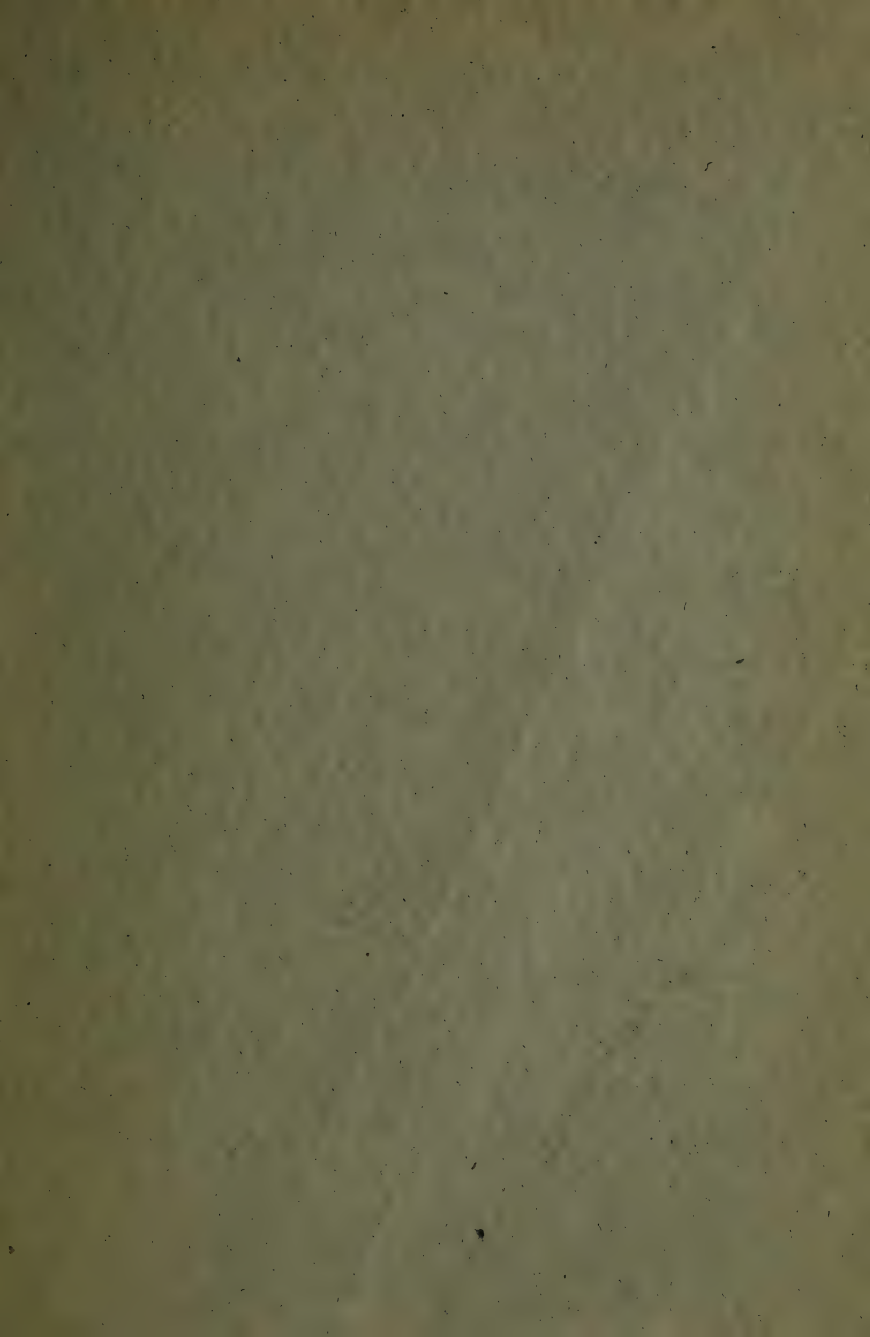
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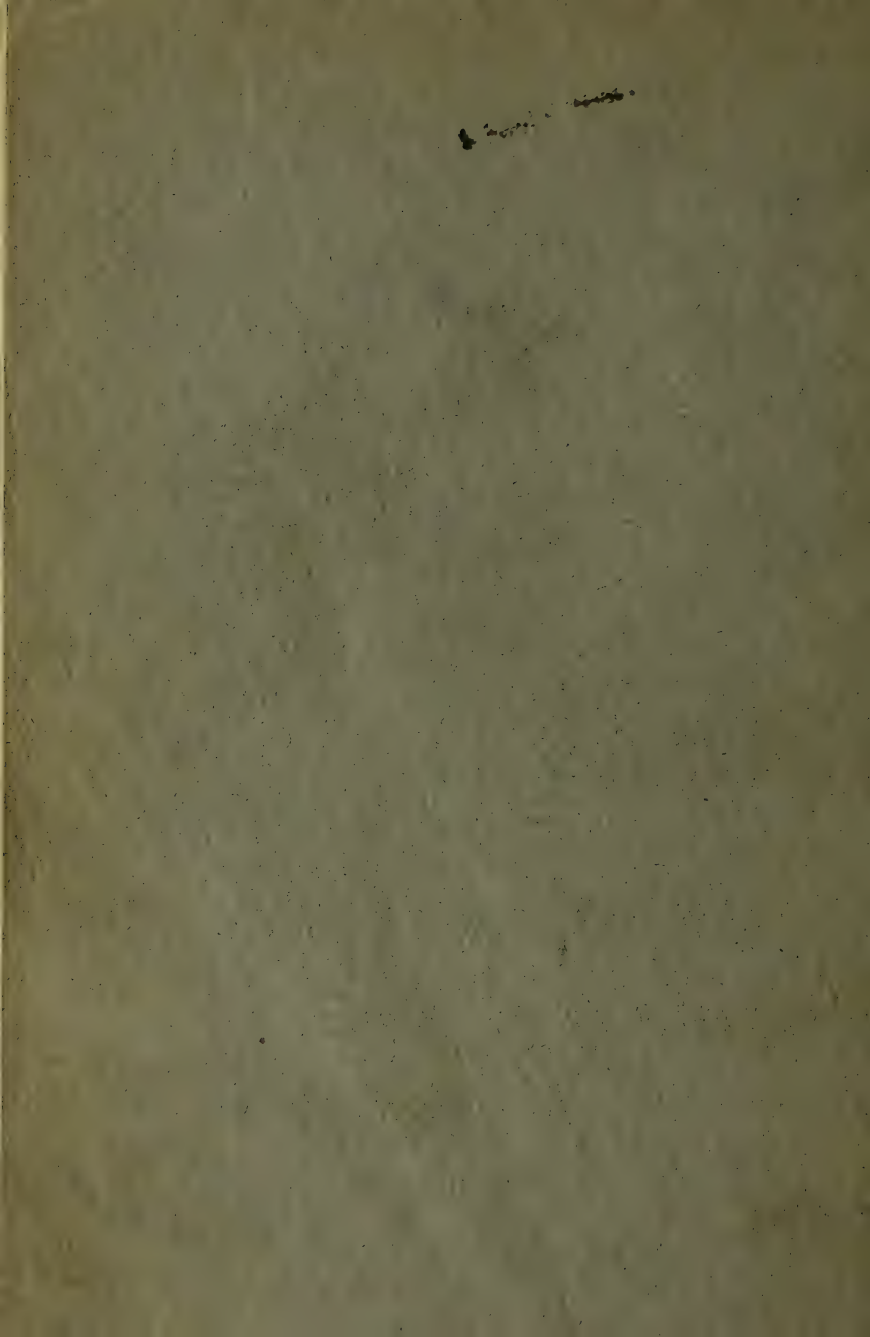
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1918/19

No. 283

ISSUED SEMI-MONTHLY

MAY 15, 1918

OREGON AGRICULTURAL COLLEGE BULLETIN



UNIVERSITY OF ILLINOIS

MAY 10 1920

Administrative Library

College Catalogue, 1918-19

WITH LIST OF STUDENTS FOR 1917-18

CORVALLIS, OREGON

CATALOGUE
OF THE
Oregon Agricultural College
FOR
1918-19

With List of Students for 1917-18



CORVALLIS, OREGON
May 15, 1918

COLLEGE PRINT SHOP
1918

CALENDAR 1918-1919

1918.

JULY	AUGUST	SEPTEMBER
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1919.

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COLLEGE CALENDAR 1918-1919

1918.

September 20, Friday—Quarterly meeting of Board of Regents.
September 23, 24, Monday, Tuesday—Registration and examinations for admission.
September 25, Wednesday—Recitations begin.
November 4, Monday—Winter Short Course begins.
November 4, Monday—Forestry Short Course begins.
November 28, Thursday—Thanksgiving, a legal holiday.
December 21, Saturday—Winter Short Course ends.
December 21, Saturday (noon)—Christmas recess begins.

1919.

December 30 - January 4, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday—Farmers' and Home Makers' Week and Rural Life Conferences.
January 6, Monday—Regular exercises resumed.
January 8, Wednesday—Quarterly meeting of Board of Regents.
January 25, 27, 28, 29—Saturday, Monday, Tuesday, Wednesday—First semester examinations.
February 3, 4, Monday, Tuesday—Second semester registration.
February 12, Wednesday—Recitations begin.
February 22, Saturday—Washington's birthday; a legal holiday.
April 2, Wednesday—Quarterly meeting Board of Regents.
April 11, Friday—Forestry Short Course ends.
May ————— Military inspection day.
May 30, Friday—Memorial Day; a legal holiday.
June 1, Sunday—Baccalaureate sermon.
June 2, Monday—Senior Class Day exercises; Alumni Reunion.
June 3, Tuesday—Commencement exercises.
Final examinations for the second semester will be held on Tuesday afternoon, June 3; Wednesday, June 4; Thursday, June 5; and Friday, June 6.
June 9, Monday—Summer session begins.
July 19, Saturday—Summer session closes.

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	Term Expires
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HON. H. VON DER HELLEN.....	Wellen, 1921
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HON. CLARA H. WALDO.....	Portland, 1924
HON. N. R. MOORE.....	Corvallis, 1924
HON. JEFFERSON MYERS.....	Portland, 1924
HON. J. K. WEATHERFORD.....	Albany, 1927
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MAC HOKE, B. S.,
Wallowa County.

ROY ALLEN WARD,
Crook and Deschutes Counties.

FRANK ROSS BROWN, B. S.,
Morrow County.

NEAL CLEMENT JAMISON, B. S.,
Washington County.

OREGON AGRICULTURAL COLLEGE

GEORGE KABLE,
Benton County.

HENRY TWEED,
Baker County.

RALPH WALDO ARENS, B. S.,
Clackamas County.

STANLEY VAN SMITH, B. S.,
Linn County.

ALBERT ALLEN ASBAHR, B. S.,
Lincoln County.

CLAUDE CLARK CALKINS, B. S.,
Sherman County.

HERWYGH LECHNER, B. S.,
Clatsop County.

JOE CEPHAS HAWKINS, B. S.,
Gilliam County.

OUTLINE OF COURSES OF STUDY

The Oregon Agricultural College offers the following courses of study, each of which extends over four years and leads to the degree of Bachelor of Science:

(Arranged alphabetically by schools and departments.)

In the **School of Agriculture**, major courses in—

- | | |
|--------------------------------|----------------------------|
| (a) Agriculture (general) | (h) Farm Crops |
| (b) Agricultural Chemistry | (i) Farm Management |
| (c) Animal Husbandry | (j) Farm Mechanics |
| (d) Bacteriology | (k) Horticulture |
| (e) Botany and Plant Pathology | (l) Poultry Husbandry |
| (f) Dairy Husbandry | (m) Soils |
| (g) Entomology | (n) Zoology and Physiology |

In the **School of Commerce**, major courses in—

- | | |
|------------------------------|-----------------------------------|
| (a) Accounting and Bus. Man. | (c) Government and Bus. Law |
| (b) Economics and Sociology | (d) Stenography and Office Train. |

In the **School of Engineering**, major courses in—

- | | |
|----------------------------|----------------------------|
| (a) Civil Engineering | (d) Industrial Arts |
| (b) Electrical Engineering | (e) Irrigation Engineering |
| (c) Highway Engineering | (f) Mechanical Engineering |

In the **School of Forestry**, major courses in—

- | | |
|----------------------|-------------------------|
| (a) General Forestry | (b) Logging Engineering |
|----------------------|-------------------------|

In the **School of Home Economics**, major courses in—

- | | |
|-----------------------|------------------------------|
| (a) Household Art | (c) Home Administration |
| (b) Household Science | (d) Institutional Management |

In the **School of Mines**, major courses in—

- | | |
|-------------------------|------------------------|
| (a) Ceramic Engineering | (c) Mining Engineering |
| (b) Geology | |

In the **School of Pharmacy**, a course in—

- (a) Pharmacy

In the **School of Vocational Education**, major courses in—

- | | |
|----------------------------|------------------------------|
| (a) Agricultural Education | (c) Home Economics Education |
| (b) Commercial Education | (d) Industrial Education |

In the department of **Chemical Engineering**, a course in—

- (a) Chemical Engineering

In addition to the above baccalaureate courses, provision has been made for the following:

1. A two-years course in Pharmacy leading to the degree of Ph. G., and
2. Vocational courses, varying in length from 6 months to three years, as follows:

- A. Agriculture (one year).
- B. Business Short Course (two years).
- C. Dairying (one year).
- D. Dietitians' Course (two years).
- E. Forestry (November 4 to April 11).
- F. Home-Makers' Course (one year).
- G. Mechanic Arts (three years).

The **School of Music**, an affiliated self-supporting department, offers instruction in voice, piano, pipe organ, violin, orchestra, and band instruments.

SPECIAL NOTICE

NEW REGULATION ADOPTED BY THE BOARD OF REGENTS
AT THEIR JUNE, 1918, MEETING.

Late Registration. Every student not registering on the regularly scheduled registration days of either semester will be required to pay late registration fees as follows:

\$1.00 for the first day late;

\$1.00 for each additional day up to a total of \$5.00.

Five dollars shall be the maximum fee. In all cases the fees will be collected as are all other fees, when the student registers.

GENERAL INFORMATION

FOUNDATION AND ENDOWMENT

In pursuance of an Act of Congress, approved by President Lincoln, July 2, 1862, a grant of land to the amount of thirty thousand acres, or its equivalent, was made to each state in the Union for each senator and representative in Congress to which the state was entitled by the apportionment of the census of 1860. The proceeds under this Act were to constitute a perpetual fund. The principal of this fund was to remain forever undiminished: but the interest arising from the fund was to be inviolably applied by each state that should avail itself of the benefits of the Act, to the support and maintenance of a "College where the leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislature of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." Ninety thousand acres of land were apportioned to Oregon; and by an Act approved October 9, 1862, the Legislative Assembly of Oregon accepted the provisions of the Congressional law.

FUNDS

Funds for the support of the College in its three grand divisions of work, Resident Instruction, Experiment Station, and Extension Service, are derived both from the National Government and the State of Oregon as follows:

FOR RESIDENT INSTRUCTION

From the National Government:

The Land-Grant Fund. The sale of the public land has netted the College approximately \$200,000. This at present is invested in securities bearing six percent interest. The Act of Congress of 1862 explicitly demands that no part of the funds so appropriated, or the interest arising therefrom, shall be used for the purchase, erection, or maintenance of any building or buildings. The interest on this fund for 1917-18 is \$11,500.

The Morrill Fund. On August 30, 1890, an act was passed by Congress "to apply a portion of the proceeds of the public land to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under the provisions of the Act of 1862." This act provides an annual fund of \$50,000.

From the State of Oregon:

The Millage Tax. The College is chiefly dependent for maintenance upon the income from the millage tax, as provided by the State legislature of 1913, which became operative April 1, 1915. The income from this source for the year 1917-18 is \$356,490.

The State legislature of 1917 made a special appropriation of \$65,000 to apply toward the erection of a library building.

From miscellaneous entrance fees, etc., for the year 1917-18, Resident Instruction work derived an income of \$11,018.

FOR EXPERIMENT STATION

Funds for the experimental work of the College, which is conducted both at the Corvallis Station and at seven branch stations located in different parts of the State, are derived from the National Government and from the State as follows:

From the National Government:

The Hatch Fund. Under an act of Congress, approved March 2, 1887, the College receives \$15,000 a year for the maintenance of an Agricultural Experiment Station, "to aid in acquiring and diffusing among the people useful and practical information on subjects connected with agriculture."

The Adams Fund. An act of Congress, approved March 20, 1906, appropriated an initial \$5,000 for that year, and \$2,000 additional for each year thereafter until the annual amount should reach \$15,000. This fund is "to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry" of the State, and therefore supplements the Hatch Fund in the maintenance of the Experiment Station.

For the support of the Branch stations at Moro, Hermiston, and Burns, the National Government appropriates \$6,700.

From the State of Oregon:

State Funds. The State legislature of 1917 appropriated \$5,000 annually for the Corvallis station and an additional \$10,000

annually on condition that the National Government appropriate an equal sum. The State also appropriates \$28,000 annually for the support of the branch stations. Of this sum, \$3,000 appropriated for the Hood River Branch Experiment Station is conditioned upon the county's appropriating \$2,000 for the support of the same station.

FOR EXTENSION SERVICE

From the National Government.

The Smith-Lever Fund. This fund was established by the Smith-Lever Agricultural Extension Act passed by Congress May 8, 1914. By its provisions the Oregon Agricultural College received \$10,000 from the Federal Government to apply towards the support of the Extension Service for the fiscal year ending June 30, 1915. This sum is to be increased annually for seven years until the total amount of \$30,200 is reached. This amount will continue as a permanent appropriation as long as an equal sum be "appropriated for that year by the legislature" of the State, "or provided by State, county, college, or local authorities, or individual contributions within the State for the maintenance of the cooperative agricultural extension work provided for in this Act."

The fund for the fiscal year July 1, 1917, to June 30, 1918, amounts to \$21,856. Since the State's obligation under this Act is fulfilled by matching the Government's increase over the original \$10,000, the sum of \$11,856, which the State contributed to this work, was taken from the total sum of \$25,000 appropriated by the State for General Extension Work (p. 27).

Department of Agriculture Funds. The United States Department of Agriculture appropriates this year \$16,120 for cooperative work through Industrial Clubs, County Agents, Special Dairy Work, Marketing and Rural Organizations, and Farm Management and Business Demonstrations. The appropriation, however, is conditioned upon the State's granting an equal sum for the same purposes.

War Emergency. To assist in establishing county agents, home demonstration agents, and junior club work throughout the State as an emergency war measure, the Government appropriated in 1917-18 \$50,300.

From the State of Oregon:

For General Extension Work. The State appropriates \$25,000 for general extension work, including movable schools, lectures,

publications, Farmers' and Home-Makers' Week, correspondence, demonstrations in agriculture and home-making. From this fund money is set aside to meet the Smith-Lever requirements, which increase from year to year by about \$3,700. The fund is therefore more restricted in its uses every year.

For Cooperative Work. For cooperative work with the United States Department of Agriculture the State appropriates \$15,000 a year, to meet the requirements already indicated.

For County Agent Work. To meet the appropriations made by the several counties for maintaining the work of the county agents, the State is now appropriating approximately \$30,780 a year.

HISTORY

As there were no State colleges in Oregon in 1868, the legislature of that year, which provided for the location of the land received under the Act of 1862, gave the interest on the funds derived from the sale of the land to the Corvallis College, a private institution in Benton County, which was then under the control of the Methodist Episcopal Church, South. For a number of years, none of the land granted was sold, and the legislature made small annual appropriations for the support of the school.

In 1885, the church voluntarily relinquished its claim on the funds of the College, and the State assumed entire control of the institution. The legislature of that year provided for the "permanent location of the State Agricultural College at Corvallis, in Benton County," on condition that the citizens of said county should, within four years, erect on the "farm containing thirty-five acres in the immediate vicinity of said city, known as the Agricultural College Farm, brick buildings for the accommodation of said State Agricultural College at a cost of not less than \$20,000." During the summer of 1887, the corner stone of the building erected by the citizens of Benton County was laid by the Governor of Oregon amid imposing ceremonies.

This structure, now known as the Administration building, was the nucleus around which other buildings soon began to cluster, as necessity and growing interest demanded. For a year or two there was ample room; but, as the institution grew, more land was needed and provided, and the institution now owns, instead of the thirty-five acres originally comprising the campus and grounds, three hundred and forty-nine acres; and instead of one

structure, thirty-six. There has also been a marked increase in the attendance, from ninety-seven to over four thousand students. Twenty years ago, most of the students came from Benton and neighboring counties. Today, every county in Oregon, 34 other states, and 15 territories and foreign countries are represented. The increase in the number of students called for an increase in the number of the faculty. This body, from the number of five in 1884, has grown until it now closely approaches two hundred. Other features usually found in connection with progressive educational institutions have grown in equal ratio. The courses have been strengthened, the standards, both for entrance and graduation, have been advanced, and other improvements have been made from time to time, which have added to the thoroughness and efficiency of the work.

ORGANIZATION

The Oregon Agricultural College is organized into the three grand divisions that characterize the work of the land-grant colleges throughout the country; namely, Resident Instruction, Experiment Station, and Extension Service. Resident Instruction, which includes all work of teaching students at the institution, is the most distinctive feature of the College life. It has always been regarded as of first importance, and will doubtless continue to be so regarded, in spite of the increasing usefulness of extension work. The Experiment Station, through systematic experiments, investigation, and research, is engaged in a search for fundamental truth. Its work is of great importance; for without it, the work of the other two grand divisions would soon become sterile and ineffective. The Extension Service, which is the newest of the three grand divisions of the College, includes all means of imparting the message of the College to the people in their own communities. It is virtually an effort to make practical and more or less immediate application throughout the State of the available truths worked out by the Experiment Station or used for resident instruction.

GOVERNMENT

The general government of the College is vested primarily in the Board of Regents, and, under their control, in four other administrative bodies—the Administrative Council, the College Council, the Faculty, and the staffs of the Experiment Station

and Extension Service. These bodies, in the exercise of their respective duties, determine the questions of policy and regulate all matters relating to the interests of the institution.

The Board of Regents consists of thirteen members, of whom the Governor, the Secretary of State, the Superintendent of Public Instruction, and the Master of the State Grange, are ex-officio members. The nine other members are appointed by the Governor with the approval of the State senate, and hold office for a term of nine years. Under a law of the State legislature, passed in 1885, the Board of Regents constitutes a body corporate, under the name of "The Board of Regents of the State Agricultural College, * * with power to sue and be sued, and to make contracts," and to enact such regulations as may be necessary for the maintenance and development of the College.

The Administrative Council consists of the President of the College, the Director of the Experiment Station, the Director of Extension, the Deans of the different Schools, and the Director of the Summer School. The function of this Council is to consider and determine the larger questions of policy and administration.

The College Council is composed of the President of the College and all officers of administration and instruction with the rank of professor, associate professor, or assistant professor. This body considers all general questions relating to the educational work and policy of the College; arranges and correlates the courses of study, and determines the requirements for admission and graduation. The different committees of the College Council, representing the several schools of instruction, have charge of the enrollment and progress of students in the respective schools, and investigate the records of all candidates for graduation.

The College Faculty comprises members of the Administrative Council and the College Council and all other instructors, including members of the Experiment Station and Extension Service Staffs. It considers routine questions of method and discipline, a function for which it is particularly well adapted, being in close contact with all that pertains to student interests and student life.

The Experiment Station Staff includes the President of the College, the Director of the Experiment Station, the heads of the various departments of the School of Agriculture, and all assistants, engaged in research and experimental work. The members

of this staff are engaged in the investigation of problems encountered in the development of the agricultural interests of the State. They also distribute, by means of correspondence, circulars, and station bulletins, information regarding their investigations.

The Extension Service Staff includes the President of the College, the Director of Extension Service, the Secretary of Extension Service, the State Leader and County Agents, the officers in charge of Boys' and Girls' Club Work, Extension Field Specialists in Horticulture, Dairy and Animal Husbandry, Agronomy, Poultry Husbandry, Organization and Markets, Highway Engineering, Home Economics, Farm Management Demonstrations, and members of the Resident Instruction Staff and Experiment Station Staff who assist in extension work.

Dean of Women. The position of the Dean of Women is administrative, supervisory, and advisory. It is the duty and privilege of the Dean of Women to know each girl so well that she may be of the greatest possible help and inspiration to her as adviser, counselor, and friend. The position covers the problems of living and social conditions, student employment, vocational guidance, and all problems which touch the young women's lives while they are in College.

The Student Affairs Committee, composed of members of the faculty, is designed to look after those interests of the students which are not strictly academic in character. It assists them in working out their social problems. It helps to maintain a wholesome relationship between clubs and fraternities and the College. It is prepared to assist student organizations in all their financial dealings. In short, the Committee strives to bring about those conditions which will make the student's college life of the greatest profit to him.

In order that freshman students may become acquainted early in their college life with student-body regulations and traditions and with college ideals, and that they may be more quickly welded into an effective class organization, a member of the Student Affairs Committee has been appointed to assist them in this work with the title Adviser for the Freshman Class. He advises them in the selection of special studies and in such other ways as may be of assistance to them.

The Students. The College does not undertake to prescribe in detail either its requirements or prohibitions. Students are met on

a plane of mutual regard and helpfulness. Since the advantages of the institution are provided at public expense, the students are under special obligation to perform faithfully all their duties, not only to the College, but also to the community and to the State. Whenever the deportment of any student is such that his influence is inimical to the interests of the institution, he will be relieved from further attendance.

PURPOSE AND SCOPE

The purpose of the College is to provide, in accordance with the acts of Congress under which it is maintained, a liberal, thorough, and practical education—an education that will afford the training required for efficient service in different branches of industry. The distinctive technical work covers the three great fields of production, manufacture, and commerce. Special attention is given to the application of science. All the practical work in the laboratories, in the shops, in the orchards, and on the farm, is based on scientific principles. While the industrial or technical work is emphasized, the importance of a thorough general training, of mind development, and of culture, is recognized in all of the work throughout the institution. The object is to meet the demand for a broad and general education, supplemented by special technical training.

The work, therefore, covers a broad field, including technical courses along the different lines of agriculture, forestry, home economics, engineering, mining, commerce, pharmacy, industrial education, and industrial arts; with the necessary training in the basic subjects of mathematics and the natural and physical sciences; and also the general training in language, literature, history, economics, political science, civics, military tactics, and physical education, which constitutes an essential part of a liberal education.

In all the work of the institution, the object is to train the mind, the eye, and the hand to act in unison; to unfold and co-ordinate the faculties of mind and body; to develop a symmetrical manhood and womanhood, and a just appreciation of clean, upright citizenship.

LOCATION

The seat of the Oregon Agricultural College is Corvallis, a city of six thousand inhabitants, situated at the head of navigation on the Willamette River. As the name implies, it is in the heart of the far-famed Willamette Valley. It is readily accessible by steam

and electric railway from all parts of the State; it has free mail delivery; there are many churches and no saloons, and the moral tone is equal to that of any city within the boundaries of the State.

Situated on high, well-drained land, open to the invigorating sea-breeze, Corvallis is one of the most healthful cities in the State. It has never been visited by any dangerous epidemic disease, and the possibilities of such visitation in the future appear remote; for the city has a complete modern sewerage system and first-class gravity water system, supplied from springs high up the slope of Mary's Peak, the tallest mountain in the Coast Range, some fifteen miles away to the westward. The city and its environs are conducive to wholesome student and home life. It has an ample supply of pure mountain water for all domestic and sanitary purposes. The atmosphere is purified and the climate ameliorated by almost constant ocean breezes — warm in winter and cool in summer. The surrounding landscape elicits praise from all who behold its delightful charms as viewed in the extensive area of fertile fields, gardens, and orchards. The wooded glens of the near-by foothills, and the lively mountain brooks, or the more pretentious streams frequented by canoe, row-boat, and launch parties, are fruitful sources of recreation; while the magnificent distant views to the eastward, where the fir-clad Cascade Mountains, with their wealth of trees and the perennially snow-capped sentinels — Hood, Jefferson, and the Three Sisters — present a constant panorama of picturesque mountain scenery. With such an environment, the city is truly an ideal location for a college and a home.

GROUNDS AND BUILDINGS

The College Grounds comprise three hundred forty-nine acres. That part of the grounds, ninety-one acres in extent, lying immediately about the several buildings, east of Cauthorn Avenue, and usually designated as the lawns and campus, is tastefully planted with both native and exotic ornamental trees, shrubs, and herbs. The one hundred and forty-three acres used for the farm, garden, and orchard operations, is so plotted and planted as to meet the demands of the various lines of work and still conform to a general scheme of landscape embellishment. This portion occupies a slightly elevated and gently undulating site wholly within the western limits of the city of Corvallis. In addition to the above plot,

one hundred and fifteen acres, comprising the College stock farm, together with the horticultural and poultry tracts, lies just south of the city limits. Broad drives and walks traverse the campus in all directions, thus rendering every objective point easily accessible. The numerous specimen trees, groups of shrubbery, and massed borders are a source of enjoyment as well as of instruction to all those who frequent the grounds. The scheme of planting has been such as to give an air of peaceful activity, orderly effort, earnest purpose, and quiet refinement. Daily association with such scenes for a period of years, during the time when men and women are forming the habits of thought and action that will be theirs through life, is certain to have a deep-seated and enduring influence for good in molding the character of future citizens.

The following brief descriptions will convey a general idea of the principal buildings and the purposes for which they are used:

The Administration Building is a three-story brick structure, 90 x 120 feet, containing recitation rooms, the library, the offices of the President, the Registrar, the Business Manager, and the Director of the School of Music. Centrally located and on a slight eminence, it commands an unsurpassed view of the campus, the city of Corvallis, and the picturesque Cascades.

Science Hall, situated southeast of the Administration building, and constructed of gray granite and sandstone, covers a ground space of 85 x 125 feet, has three stories and basement, and contains fifty-five rooms. It is one of the most serviceable buildings on the grounds, and within it are housed the departments of Chemistry and Pharmacy, with their various laboratories, recitation rooms, and lecture halls, together with the offices and laboratories of the Experiment Station chemists.

Agricultural Hall, standing southwest of the Administration Building, is the largest structure on the campus. It is an imposing edifice of brick and sandstone, consisting of the central or Administrative building, the north or Agronomy wing, and the south or Horticultural wing.

The central or Administrative building is 66 x 140 feet, four stories and basement, and contains conveniently arranged and well-lighted class rooms, laboratories, and offices. On the first floor are the offices of the Director of the Experiment Station and Dean of the School of Agriculture, the Director of Extension Ser-

vice, the State Leader of County Agriculturists, the State Leader of Industrial Clubs, with their several branches, the Editor of Publications, the Editor of Press Bulletins, and the College Exchange. The second floor is occupied by the department of Animal Husbandry, and the School of Industrial Education; the third floor, by the departments of Zoology and Entomology with their respective museums; and the fourth floor, by the departments of Bacteriology and Art.

The north or Agronomy wing is 72 x 130 feet, three stories high. It is thoroughly modern in all its equipment, and while intended solely for the work in Agronomy, at present accommodates also, temporarily, the School of Commerce. The first and second floors, occupied by the departments of Soils and Farm Management, Farm Mechanics, Farm Crops, and Drainage and Irrigation, contain, in addition to the offices of these departments, rooms variously devoted to laboratory and class purposes. All of the third floor and office rooms on the first and second floors are used by the School of Commerce.

The south or Horticultural wing is 72 x 130 feet, three stories high. In the basement are located laboratories for plant propagation, spraying, vegetable preparation, and fruit packing. The basement also contains the general storage rooms for the department, and rooms which are especially adapted for the storage of fruits. The first floor contains the offices of the division of Horticulture, the research laboratory, systematic pomology laboratory, and three large lecture rooms. The second floor contains the offices and museums of the department of Botany and Plant Pathology, recitation rooms, and student laboratories. The third floor contains the horticultural museum and horticultural herbarium, photograph room, large student lecture room, draughting rooms, lecture rooms, and office of the Landscape Gardening section. These rooms are all especially well lighted and contain every convenience for conducting the work with efficiency.

The Library Building. The much-needed new library building is located south of the Mines building. It consists of two stories and basement in front and three stories and basement at the back. It is built of red brick and gray terra cotta, presenting a quiet and dignified appearance, in keeping with the use, fundamental to education, to which it is to be put. The most modern and effective system of lighting, heating, and ventilating is installed.

The first floor consists of an entrance hall, two large lecture rooms for the use of one-credit and other classes too large to be accommodated by the class room of ordinary size; on this floor are the cloak rooms for the use of students. The second and third floors at the front are occupied by a large, light, convenient reading room ample to seat over three hundred students. This will accommodate both faculty and students, providing the quiet, commodious room needed for reference work; back of this room on the second floor are the offices, cataloguing and other work rooms. The third floor consists of comparatively small rooms designed ultimately for seminar rooms for the use of such of the departments as must make the library their chief laboratory; however, in the present condition on the campus, with its lack of recitation rooms and laboratories, this story must be largely given over for the present to meet this pressing need.

The northwest part of the library contains the fire-proof steel stack room which will house the formerly scattered collection of valuable books in safety, and permit their much easier, and more effective use.

The building is ample to accommodate the growth of the library for many years and its architecture permits, when time and growth demand it, sufficient stack expansion for many more.

Greenhouses. A range of greenhouses, aids the student in his studies in commercial greenhouse work. The range is made up of five even-span houses, three ninety feet long by twenty feet wide, and two thirty-three feet long by twenty feet wide, making the total area under glass 6,720 square feet. A hot-water heating apparatus has been installed, with valves and pipes so arranged that different temperatures can be maintained in every separate thirty feet of house in the three long houses. Each of the large houses has been divided into sections thirty feet long, so that the entire space in each may be given up to a single crop. Of the two smaller houses, one is given up to research work, and one to the propagation of plants in general. The central building is large and conveniently arranged for all work that is to be met with in greenhouse establishments. Such crops as carnations, chrysanthemums, violets, palms, ferns, general pot plants, and forced vegetables, like tomatoes, lettuce, and cucumbers, are grown in these houses.

Dairy Building. About sixty feet to the northward of the Agricultural building is located the Dairy building. The general

scheme of both outside and inside finish is similar to that of the Agricultural building. The structure is 54 x 141 feet, three stories high. On the first floor are located the offices of the Dairy department and commodious laboratories for butter-making, cheese-making, and market milk instruction, including a well-equipped boiler and engine room and student lockers. On the second floor are the testing laboratory, advanced laboratory, farm dairy and shop rooms, veterinary laboratories, etc. The third floor is temporarily occupied by the department of mathematics, with the exception of a general lecture room, extending across the south end of this floor, and having a seating capacity of two hundred.

The Forestry Building. A three-story Forestry building, eighty feet wide and one hundred and thirty-six feet long, has been constructed to house the work in forestry and logging engineering. This building contains roomy laboratories for work in silviculture, dendrology, mensuration, forest protection, technology, drafting, and logging engineering. As rapidly as material can be assembled these laboratories will be supplied with the various forms of instruments and equipment which the peculiar work of each requires. In addition to the laboratories, space is to be devoted to a collection of manufactured wood products, designed to show the various uses to which wood may be put, and to a forest museum in which will be assembled large specimens of all commercial woods of the United States. All available publications dealing with forestry and logging subjects are provided for the use of students. Portions of the building are used temporarily by the department of English and the department of Poultry Husbandry.

Home Economics. The first wing, 68 x 120 feet, of the new Home Economics building is occupied by the departments of Domestic Science and Domestic Art. The building is located directly west from the Dairy building. It consists of three stories above a high basement, and is finely built of brick and stone. Heating and ventilating systems of the most modern type are installed, and all provisions are made for the comfort and convenience of the young women carrying the work in Home Economics. Offices for the Professors of Domestic Science and Domestic Art and the assistants in both Domestic Science and Domestic Art, are on the first, second, and third floors.

The food laboratories are on the first and second floors, while the Domestic Art department has all of the third floor of the

building and part of the second floor. Ample locker and dressing rooms are provided for the convenience of the students, and hot and cold water is supplied in all parts of the building. The housing and equipment of the School of Home Economics, in short, are thoroughly modern, and adequate for immediate needs.

The Mines Building, which is 65 x 81 feet in dimensions, is located about 100 yards northwest of the Administration building, and is one of the newer buildings on the campus. This building forms the northern boundary of the quadrangle which is planned in the new building scheme on the College campus. It is a fine four-story structure, constructed of brick, trimmed with stone, and similar in type to Agricultural Hall. The first floor of the building contains the main offices, assaying, metallurgical and ore-dressing laboratories. The basement contains the crushing and sampling rooms, the ceramic laboratory, and the stock rooms. On the second floor will be found the Bureau of Mines laboratory and lecture and class rooms. On the third floor is the geological museum, the mineralogical and petrological laboratories, and draughting room. All the laboratories are provided with water, gas, electric lights, and steam heat.

Mechanical Hall, situated about one hundred and fifty yards northeast of the Administration building, is 90 x 120 feet, two stories high, and constructed of Oregon gray granite and sandstone. It is an attractive, substantial building, well arranged and admirably adapted to the purposes for which it is used. Besides recitation and lecture rooms for the classes in Industrial Arts, Mechanical, Electrical, Civil, Highway, Irrigation, and Experimental Engineering, it contains the Physical and Engineering laboratories.

Mechanical Arts Building is a modern, well-lighted structure of brick, with cement foundations, 52 x 52 feet, two stories high, flanked by a one-story wing on the east, 40 x 220 feet, and a similar wing on the south, 40 x 200 feet. The central portion contains the office of the Dean, a display room for student work, a tool room for the machine shop, and a finishing room for the wood shop. On the second floor is a general draughting room, 30 x 50 feet, with a commodious blue-print room and a dark room adjoining. The south wing contains the main woodworking shop, 40 x 97 feet, a stock room, 30 x 40 feet, a carpenter shop, 20 x 40 feet, and the College printing plant, 40 x 50 feet. The east wing

contains the machine shop, 40 x 80 feet, the blacksmith shop, 40 x 100 feet, store room for coal and iron, lockers, and toilet rooms.

The Foundry, which is located immediately south of the blacksmith shop, is built of brick. It contains one 22-inch Colliau cupola for melting iron, one brass furnace, one portable core oven, one stationary core oven for larger work, one twelve-hundred-pound crane ladle, one eight-hundred-pound crane ladle, and several smaller ladles. It contains also one crucible brass furnace, one two-ton jib crane, one post crane, one No. 2 Delano pulley molding machine, one tumbling barrel for cleaning castings, and a liberal supply of smaller tools, flasks, etc.

The Women's Gymnasium is situated about two hundred yards south of the Administration building, and is erected against a gently sloping bank on Jefferson street. The structure, 70 x 120 feet, is built of stone and wood, and comprises a high, airy basement, or first floor, facing east, with the main floor above it, having a bank entrance on the west end. The first floor of the building is devoted to locker rooms, dressing rooms, bathrooms, and offices, together with a rest room and a special room for corrective gymnastics. The second floor consists chiefly of one large gymnasium room, which is also frequently used as a lecture hall, assembly room, and social center for moderate-sized gatherings. This room, which comprises 8,000 feet of floor space, is surmounted by a balcony running track, suspended from the trusses. It affords facilities, in a court of 79 x 54 feet dimensions, for basketball, indoor baseball, tennis, and various winter and indoor games. The building affords ample accommodations for the physical training of all the women of the institution.

The Men's Gymnasium is situated immediately west of Waldo Hall on Jefferson street, adjoining the main athletic field. The structure is to consist of four units, the central part being 90 x 150 feet, with each wing 52 x 96 feet in dimensions. The fourth unit will provide a swimming pool 50 x 100 feet, of modern design and finish. Only two units were completed during 1914, the main hall and the east wing. The main hall is used as a lecture and assembly room, or a place for entertainments when large audiences are to be accommodated. The showers and the baths are of modern design, providing hot and cold water throughout the year. The floor of the main hall with its 13,500 square feet of surface,

provides space for three basketball courts, indoor baseball diamond, and space for various winter and indoor games. The east wing provides boxing and wrestling rooms, and an auxiliary gymnasium with special apparatus for use of the individual and for corrective gymnastics. When completed, the building will have accommodations for upwards of 2,000 men.

The Armory is situated about three hundred yards south of the Administration building. It is one of the largest of its kind in the United States and is built of concrete and steel, 126 x 355 feet. The drill hall portion has an unobstructed area of 36,000 square feet. The arms room, offices, and drill hall afford facilities for the accommodation of 1,000 men.

The New Heating Plant, located at the south end of the Armory, is a one-story reinforced concrete building, with a concrete tunnel and conduits leading to the various buildings on the south side of the campus. It contains three boilers, one two-hundred-ninety, one two-hundred-fifty, and one one-hundred-fifty-five horsepower, with the necessary equipment for heating the buildings connected with it.

The Power Plant, a one-story brick building in the rear of Mechanical Hall, contains the requisite equipment for supplying the various buildings with heat, light, and power. The apparatus installed in this building serves the purpose also of demonstration equipment in these special lines.

Waldo Hall, one of the two halls of residence for women, occupies a commanding site one hundred and fifty yards west of the Armory. It is a large building of striking appearance, with a cement foundation and basement wall, and a cream-colored, pressed-brick superstructure, three stories high. The dimensions are 96 x 240 feet; and it contains one hundred and twenty-five rooms for students, besides a kitchen, dining room, and parlors. It is modern in all its appointments and finished throughout in natural grain Douglas fir, stained to conform to the color scheme.

Cauthorn Hall, the second of the women's halls of residence, is a well-proportioned frame building, situated on a commanding spot in the western part of the campus. It is 160 x 50 feet, has three stories and basement, and contains sixty-two rooms, besides a large kitchen, dining room, and reception rooms. Its furnishings and appointments are adequate, modern, and in harmony with its

use. Each floor is supplied with hot and cold water, baths, electric light, and steam heat.

Shepard Hall, the student building under the auspices of the Y. M. and Y. W. C. A., was completed at a cost of something over \$22,000. This building contains in the basement a swimming pool, shower baths, lockers, banquet room, kitchen, wood room, and accessories. The first floor contains a large lobby which is used for a reading room, game room for social events, and general assembly. It also contains offices for the General Secretaries, a public office, a cabinet and check room combined, and a room for the Y. W. C. A. The second floor contains six rooms for the use of the literary and dramatic societies, the Cosmopolitan Club, and the staff of the Oregon Countryman. The building, known as Shepard Hall, is a fitting tribute to the memory of Clay Shepard, who gave his life to the cause of cleaner, higher, and truer citizenship as exemplified in student life.

Horticultural Products Building. The building is of brick, 72x46 feet in dimensions, with full basement and two additional floors. It will be provided with steam, hot and cold water, and electricity for both lighting and power. On the first floor will be a large evaporation room in which will be found a prune tunnel drier consisting of three tunnels twenty-two feet long. Here also, will be found a kiln drier to be used especially for such fruits as apples. Accommodations are also being planned for special forcedraft evaporators. Adjoining the evaporation room will be a receiving room, which can be utilized for processing, or for jam and jelly making. This floor will also contain an evaporation room for the manufacture of juice, vinegar, and similar products.

On the second floor will be a large canning room 72 feet long, which will be equipped for the canning of fruits and vegetables; a room for experimenting with special fruit products, such as glace' fruits, maraschinos, etc. On this floor will also be set aside a room for young women in Domestic Science where they will work out the food value of the various products which the Horticultural division is able to prepare.

In the basement of this building will be excellent storage facilities for canned goods, vinegars, etc. The building will be equipped with an elevator. The inside walls will be of brick with enamel coating, and the floors will be waterproof, so that the entire building can be flushed out.

Farm Buildings. The College Farm is now well equipped with farm buildings, and modern facilities for conducting practical and scientific work in animal husbandry.

The Dairy Barn is commodious, modern, and attractive in design. It is a frame building, with cement foundation and brick pilasters. The main part is 50 x 100 feet, two stories high, with two wings extending to the south, each 46 x 80 feet, one story in height. There is also a milk room, an engine room, and a fuel room. The building is utilized as a general barn, and will accommodate nine horses and seventy cattle, with sufficient space for the storage of feed. On the first floor of the main portion are located the horse stalls, bins for storing the various grains and mill feeds, a seed room, and space for vehicles. The concrete basement is of sufficient dimensions to permit the storing of about one hundred tons of roots. The second floor has a storage capacity for one hundred tons of loose hay. A prominent feature of the barn is the cow stable. This is strictly modern, well lighted and ventilated, with concrete floor, thirty individual, tubular-iron adjustable stalls, and three commodious box stalls. The aisles are wide, and thus not only furnish an abundance of air space for the animals, but also afford visitors an excellent opportunity to view the stock. The milk and engine rooms are conveniently situated, but sufficiently isolated for proper sanitation. This building is lighted by electricity, well supplied with water, thoroughly sewered, and furnished with an elaborate system of bell traps. Adjoining this stable is a stave silo, built several years ago, and a new concrete silo, completed in 1914, for use of the Dairy Husbandry department.

The old barns were moved and remodeled so as to harmonize with the new structure. They contain rooms for housing machinery and tools.

The New Cattle Barn. The department of Animal Husbandry is fortunate in having been able to erect a modern beef-cattle and sheep barn. It is located just west of the old barns, and has a floor space of 52 x 120 feet for sheltering stock. The hayloft has a storage capacity for 300 tons of hay and straw. Adjoining the barn are several concrete-floored exercise lots and a new stave silo. Especial conveniences are provided for the feeding, watering, weighing, and handling of live stock. The west half of the barn is at present devoted to beef cattle and the east half to

sheep, although it is planned that the entire barn will eventually be used for beef cattle.

The Stock Judging Pavilion. The Animal Husbandry work of the College is greatly facilitated by a judging pavilion, which provides very comfortable and commodious quarters for all of the demonstration work with live stock. The main room is 40 x 90 feet, well lighted, and provided with heat. A movable partition is provided whereby this large room may be divided into two smaller ones, each large enough for all ordinary purposes. The live-stock work in the past has been very much handicapped by crowded quarters without heat or good light, but these difficulties are now past and the department is in a position to do much better work than before.

The Veterinary Building, a frame structure 56 x 65½ feet, is to be used for both instructional and Experiment Station work. The front part of the building consists of two rooms, amply lighted by sky lights and large windows. One of these is an amphitheater, with a seating capacity of about 120. This will be used very largely for clinic. The arena is sufficiently large for casting animals for surgical work. The opposite room is to be used for dissection and for holding autopsies. It is equipped with an overhead track for suspending carcasses, and is large enough to accommodate five dissection subjects at one time.

The back part of the building is divided into two stories. The first floor consists of a dressing room, toilet and shower-bath room, drug and instrument room, and stalls. There are three box stalls, two of which can be thrown together for use as a maternity stall. There are three tie stalls. The stalls will be used for both clinical and experimental animals. The second floor has ample capacity for storing feed, and for housing guinea pigs and rabbits.

There are two exercising paddocks just behind the building. The paddock fences have a baseboard which extends about 3 inches below the surface of the ground. The fences are doubled, with the necessary space between them to render the paddocks safe as quarantine pens.

Farm Mechanics Building. A modern building has recently been completed for the Farm Mechanics work. It is an attractive, well-lighted brick building, having a large operating floor, a class room, locker room, shop, and tool room on the first floor. This operating floor is of cement and is roomy enough for demonstra-

tion and for the operation of the heavier farm machines. Within this place is reserved space for the very heavy farm tractors. A gallery surrounds this operating floor and provides space for the lighter farm implements such as tillage, haying, and harvesting machines.

The building is equipped with shafting, belting, and power for the operating and testing of the various machines, and a large well is provided for making pump tests. A very complete equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest; so that the student has constantly before him and is working with and studying the very best classes of farm machinery of all types.

Representative machines are found in the laboratory as follows: plows, harrows, pulverizers, cultivators, plant-setting machines, corn planters, potato planters, grain and grass seeders, mowers, rakes, binders, sprayers, manure spreaders, potato diggers, wagons, etc. Among the power machines are stationary gasoline engines, various types of pumps and pressure water systems, feed grinders, gasoline tractors, steam tractors, gang plows, farm lighting plants, and complete threshing machines. All of this expensive equipment is available to students in Farm Mechanics in the regular and short-course work.

The Poultry Houses. On a five-acre tract of land, lying south and west of Cauthorn Hall, there have been erected several buildings especially planned for the needs of the department of Poultry Husbandry. The main poultry building is a three-story structure and is used principally for class, laboratory, and demonstration purposes. It contains a demonstrating room with desks and other necessary equipment; a shop, with the necessary tools, benches, and equipment for practice work in building poultry-plant equipment; storage rooms, office, and wash rooms are also provided. In the basement, rooms are provided for fattening and killing fowls, an incubator room for student use, and a feed room with the necessary machinery for grinding and mixing poultry feeds. Besides the main poultry building there is an incubator house, with a capacity of twenty-four incubators and complementary apparatus; and a feed-storage building and a brooding house. There are also colony houses for laying and breeding stock and growing chicks. The colony houses are movable and constructed upon a plan that could be adopted by any farmer. The colony brooding coops are also

portable, and are used for investigations in both natural and artificial brooding.

Hog Barn and Feeding House. During the fall of 1916 the Animal Husbandry department secured its long-needed hog barn and feeding house. The barn is designed especially for farrowing and contains twenty-nine pens, with a four-foot alley running the length of the building from east to west. Concrete is used for the entire floor, the feeding troughs, and the automatic watering equipment. The feed house is twenty-eight by forty feet in dimensions, three stories high. The ground floor is occupied by a driveway and entrance alley, root bin, two large grain bins, which extend through the second story, and a hopper for dumping grain into the elevator, which leads to the third floor. It provides also equipment for dividing, weighing, and loading pigs, as well as a small boiler for heating water. The second story provides room for the storage of straw, six smaller grain bins with hopper bottoms, and sleeping quarters for the herdsman. The third floor contains the grinder, motor, chutes to grain bins, and storage room for movable equipment. The total capacity of the building is 15 tons of roots, 6308 bushels of grain and 40 tons of straw.

COLLEGE ORGANIZATIONS

One of the most important factors in rounding out the results and benefits of a college course is the society, club, or association work. As a result of the diverse interests of college life and the varied tastes of the students, the following organizations, besides many others, are maintained by students and faculty:

The Student Body Assembly. This is an organization of the entire student body working under a constitution and by-laws approved by the faculty and having general authority over all student body enterprises. Student body officers are elected annually. Nominations and elections are conducted in a manner similar to that of the state electorate. The officers consist of a president and secretary chosen from the Senior class, and three vice-presidents chosen one each from Senior, Junior, and Sophomore classes. These officers, as a whole, constitute the executive committee of the student body and have general supervision of all affairs of interest to the student body.

The Board of Control. The Board of Control consists of three faculty members appointed by the President of the College, one

alumnus chosen by the Alumni Association, and five students who are the executive committee of the student body. The student body constitution vests in this Board of Control authority to supervise all student body interests entailing the expenditure of student body funds. They exercise functions in the main by the approval of budgets and schedules. The immediate supervision is exercised through a general manager appointed by the Board of Control.

Student Self Government. A system of student self government has been established at the College which places the general disciplinary powers of the Institution in the hands of the students. The Student Council, an organization made up of ten students, five of whom are Seniors, three Juniors, and two Sophomores, has been created and vested with such powers as are necessary to enforce the rules and regulations adopted by the students. Three members of the Student Council hold that position by virtue of their office as president of each of the classes. The remaining members are elected annually by popular vote of the student body.

The Literary Societies. These organizations have the common purpose of promoting literary work among the students. The weekly literary programs and occasional joint meetings tend to this end. The Shakopean is essentially an honorary society, membership depending upon honors won in debate or oratory at the College. To stimulate interest in debate and oratory, there are held during the year intersociety, intercollegiate, and interstate contests. Gold medals and cash prizes are presented to the winners in the contests, and the successful society in debate receives the "Gatch Cup." This is the silver cup that was presented in 1901 by Dr. Thomas M. Gatch, then president of the College, to the society that had received highest honors in the season's debates. Annually this cup is to go to the successful society in debates, but it is ultimately to become the property of the society winning it three years in succession. Many and determined have been the battles for its possession, but the cup is still without a permanent home.

The Christian Associations. The Young Men's Christian Association was organized in the Oregon Agricultural College as a part of the International Brotherhood in 1890. Since that time it has grown until it includes in its membership about one-fourth the men in the Student Body. The erection by the Y. M. C. A. of Shepard Hall, the student community building, which contains a swimming pool, reading, social, and game rooms, has greatly

increased the scope and added to the effectiveness of the work. The Association aims to provide a high moral atmosphere and pleasant social advantages for its members and their fellow students. Members are trained in executive and committee service in work for their fellows and the community. Meetings are held in Shepard Hall each Tuesday evening; Bible, Mission, and social-study classes are regularly conducted; visitation committees call on students who are ill or disheartened; school boys of Corvallis are organized into clubs and Boy Scout patrols; regular socials are held in conjunction with the Women's Association; and extension work is conducted in vicinities near Corvallis. On registration days, committees are on hand to assist students in securing comfortable quarters in good homes and in adjusting their work satisfactorily. Those who make their way through College will find the employment bureau of the Association always ready and glad to assist them as far as possible in securing positions.

The Y. W. C. A. aims to cooperate with all the forces of the College in promoting among the women students a well-developed life. The rooms of the organization are located in Shepard Hall, the student community building. On registration days committees are appointed to meet incoming students and to help them in adjusting their work. Those who wish to earn their way through College will find the employment department ready and glad to assist them as far as possible in procuring positions. Weekly meetings are held in Shepard Hall on Thursday, and there is a Sunday Vesper service to which all women are welcome. Bible and Mission Study classes, social service work, socials and teas, all tend to make up the program for the year's work. Three-fourths of the women in College are members of the Y. W. C. A. and more than that number are enrolled in voluntary Bible Study.

The Athletic Association. This organization, maintained by the students through the student body assembly, encourages wholesome competition in the various outdoor and indoor intercollegiate sports. It has charge of all details pertaining to the conduct of intercollegiate athletics in which the College may be interested. A committee of the faculty has general supervision over the whole subject of athletics, thus assisting to insure a sound and conservative management.

The Varsity O Association. This association, which succeeds the Orange O Club, includes all men of the College who have been

officially awarded the Orange O in recognition of service on the intercollegiate athletic teams of the College. Its function is to promote the athletic ideals of the College and to serve in an advisory capacity to the Athletic Board of Control.

College Folk Club. This club was organized in October, 1908. Membership is open to all women of the faculty and other women employees of the institution, and to the women members of the immediate families of the faculty and other employees. The object of the club is social diversion, general culture, and the promotion of the best interests of the College and the community. The organization at this time is divided into three sections: Sociology Section, Mothers' Section, and Dramatic Section. Aside from the semi-monthly meetings of the various sections, the general club convenes on the first Saturday of each month, at which time an address is given by an outside speaker, or a musical or literary program is furnished by members of the club. In January, 1913, the organization became affiliated with the Oregon State Federation of Women's Clubs. It is the purpose so to extend the work of the club as to effect the greatest possible good to the College and to the city.

The Mask and Dagger. This club was organized for the purpose of offering special training in dramatic art. A semi-annual "try-out" is held in which all students of the institution may participate, and any who possess talent in this direction may be elected to membership in the club. No student, however, will be permitted to take part in a public production who has not an average for all of his College work, at the time the play is being prepared, of 75 percent. Platform exhibitions will be given and standard plays presented during the College year.

The Oratorical Association. This body has immediate charge of all business pertaining to the competitive work in oratory and debate. Schedules, dates, prizes, conditions of competition, and all similar matters are in its care.

Intercollegiate Debate and Oratory. Each year the Oregon Agricultural College has three intercollegiate debates, putting into the field six teams, three supporting the negative and the others the affirmative of the same question. The College sends one representative each year into the old-line State Oratorical Contest in which eight colleges take part. Gold medals are awarded to the

men who represent the College in these events. Each year also the College sends a representative to the State Peace Oratorical Contest, where two prizes of \$75.00 and \$50.00 respectively are awarded for first and second place.

Local Debate and Oratory. A local peace oratorical contest is held annually, to the winner of which the Cosmopolitan Club of the College presents a cash prize of ten dollars. There are also interclass contests in Declamation, Debate, Oratory, and Extempore Speaking, prizes being awarded by the Oratorical Association to the winners of these events. These latter contests are forensic events in the annual Interclass Forensic-Athletic Championship Contest, wherein the four classes compete for individual prizes and three loving cups — the Shakopean Cup, which becomes the permanent property of the highest individual forensic point-winner of the class winning the championship; the Orange O Cup, which becomes the property of the best athlete in that class; and the Barometer Cup, which is held one year by the class winning the interclass championship.

The Sphinx. This is the senior honor society. Membership is acquired by election based on prominence in student activities and excellence in scholarship.

The Forum. This society was organized by the junior and senior classes in the spring of 1914, its primary purpose being to recognize efficiency in scholarship among junior and senior students. Election is made to the society by its own members. The fact that high standards of general excellence have been set by charter members makes it a decided honor to any student to be elected to membership.

The Cosmopolitan Club. This is an organization of foreign and American students. It is a local chapter of the Association of Cosmopolitan Clubs of the World. Its purpose is to provide social and educational advantages for its members and to promote international friendship. At present, eleven nations are represented in the local chapter.

The Agricultural Club. This club was established for the purpose of advancing interest in the various phases of agriculture, and promoting the investigation and discussion of both general and special agricultural subjects. Suitable programs are

prepared for each meeting, and whenever practicable, leading authorities on practical agriculture are engaged to address the members.

The Lewelling Club. This is the Horticultural Club conducted under the auspices of the Horticultural department. There is no regular organization, except an executive committee, which has power to transact such business as requires action on the part of the club. It is open to all students interested in horticulture.

The Withycombe Club. Membership in this club is open to all students taking Animal Husbandry work. The meetings of the club are devoted to discussion of Animal Husbandry topics not ordinarily covered in formal class-room instruction.

Gamma Sigma Delta. There is established at the College a local chapter of this national honorary agricultural fraternity. The aim of the society is to advance the study of agricultural subjects by giving honorable recognition to students taking the lead in this work. Elections to membership are made from the senior class by the members of the local chapter.

The Forest Club. This is an association of students and instructors "formed for the purpose of promoting the forestry interests of the State." In order to carry out its purposes, it meets twice each month. The first meeting of each month is purely of a social nature, with each alternate meeting for the discussion of current forestry literature, magazine articles, news items, legislation, and general progress movements pertaining to forests, forest service, forest products, forest industries, lumbering, and the lumber trade.

The Civil Engineering Club. This is an organization within the departments of Civil and Highway Engineering. The active membership is drawn from the junior and senior classes, and the privilege of associate membership is extended to the members of the two lower classes. It meets weekly for the discussion of subjects of interest to the civil and highway engineer.

The Electrical Engineers. This is a College branch of the American Institute of Electrical Engineers. The aim of the organization is to discuss the topics contained in the monthly proceedings of the A. I. E. E., and in this way develop in the student an intimate knowledge of the activities of the national organization,

thereby coming into closer touch with the practical problems in the engineering world and becoming better fitted for their life work.

The Miners' Association. This body has for its object the discussion of technical engineering subjects; the review of current mining literature; the presentation of original papers by the active members; and occasional lectures on special mining topics by men outside of the College.

Mechanical Engineers. This is a College branch of the American Society of Mechanical Engineers. The purpose of the organization is to meet at regular intervals for presentation of technical papers by members and by practicing engineers. Current topics of interest to engineers are also discussed at these meetings and an effort is made to keep in touch with the practical problems of the engineering world.

Sigma Tau. This is a local chapter of the national honorary engineering fraternity, chapters of which exist at nearly all of the recognized technical schools of the United States. Membership in the fraternity is restricted to junior and senior students in Engineering and Forestry, election to membership being based principally upon excellence in scholarship.

The Home Economics Club. This is an organization for the purpose of bringing all the women of the School of Home Economics into closer touch with one another than is possible without a central organization. The aim of the club is to give, by a series of monthly meetings, a general survey of Home Economics questions not covered in regular class-room work. The aim is carried out by means of well-directed discussions and by securing outside lecturers who by virtue of their training and experience are considered authorities on subjects relating to Home Economics.

Theta chapter of Alpha Kappa Psi, a national fraternity devoted to the profession of Commerce, was organized during the school year of 1913-14. The purpose of the fraternity is to promote investigation along scientific lines in all phases of commercial work. Membership is open only to students in the junior and senior year in the School of Commerce; and in order to become a member, the student must have shown himself a leader both in scholarship and in student activities.

The Commercial Club. This is a student organization within the School of Commerce. The purpose of the club is to bring its members into close relation with current methods and events in the commercial world. This is accomplished by discussions of topics pertaining to commerce by members of the club, and by addresses at various times during the year by prominent men in the fields of law and business. Active membership is open to all members of the School of Commerce.

The Pharmaceutical Association. The main purpose of this organization, which consists of the pharmacy students, is to bring its members into closer relation with the current events of the pharmaceutical world. This is brought about by discussions in the meetings of topics pertaining to pharmacy, and by addresses at various times during the year by prominent pharmacists and salesmen of the State.

The Easterners' Club. Membership in the Easterners' Club is open to all students and faculty people who have at any time resided in those states situated east of the Mississippi River, or in those provinces of Canada east of Manitoba. The objects of the club are to promote the interests of the College throughout the East, to encourage prospective students from the East and to offer social diversion to its members by providing occasions for the mingling of ideas on such current events as the sports and politics, which are represented by the various states included within the membership.

The Eastern Oregon Club. This is an organization effected for the purpose of promoting the mutual interests of the College and the people of the eastern part of the State. Its members are afforded many social and intellectual advantages from the regular club meetings. Membership is open to all students from Eastern Oregon.

The California Club and The Washington Club, are, as the names imply, composed of students whose homes are in California or Washington. It is for the purpose of bringing "Californians" and "Washingtonians" together socially that the clubs meet.

The Portland Club is composed of all of the students registering at the College from Portland, the primary object of the club being social diversion among those students who have been associated in their high-school work in previous years.

COLLEGE PUBLICATIONS

Two classes of publications are issued from the College; one official, published by the College authorities; the other, unofficial, published by the various student organizations.

The College publications include:

The Catalogue. The General Catalogue, published in the spring, contains much general and specific information as to the courses of study, equipment, and instruction, and gives a list of faculty members, and of students registered up to the time of publication.

The Bulletins of the Summer School. These announcements contain specific information of expenses, courses of instruction, character of the work presented, and the requirements that prospective students must meet.

The Bulletins of the Winter School. These announcements carry such information regarding the winter courses as may fully present the advantages of these courses to the public.

Extension Bulletins. These bulletins consist of monographs on the various phases of Agriculture, Domestic Science and Art, Engineering, Mining, and Commerce, together with the bulletins and circulars issued in connection with the Industrial Club work for boys and girls in the public schools and the Home Cooperative Demonstration Projects. They are written in such style as to be easily understood, thus meeting the popular demand for scientific knowledge and giving it in such form that the people of the State may profit by its application to the problems of everyday life.

The Extension News, a monthly periodical devoted to items of timely information sent to citizens of Oregon on request.

The Station Bulletins. These publications include reports upon research problems and upon experimental investigations in agronomy, horticulture, drainage and irrigation, dairying, animal husbandry, poultry husbandry, insect pests, plant diseases, home economics, and special subjects of interest to the husbandman, conducted at the home station or the several branch stations.

STUDENT PUBLICATIONS

The student publications comprise:

The Barometer. In March, 1896, the literary societies of the College began the publication of a monthly periodical, the "O. A. C. Barometer." The enterprise has met with deserved success, and "the organ of the student body" is now issued as a four-page, six-column semi-weekly. It publishes the "news of the College," and is of general public importance as representing the interests, character, and accomplishments of the student body at the College. By action of the Board of Regents, resulting from a unanimous recommendation of the Student Body, a portion of the regular semester student fee of \$5.00 will be devoted to the "Barometer," and every student will regularly receive the paper.

The Beaver. This is the annual publication of the junior class, and made its initial appearance as "The Orange," in 1907. It is a high-class publication, substantially bound, and fully illustrated with photoengravings, pen and ink sketches, line and wash drawings. It is a full-dress carnival of the year's life, representing the dignity, the beauty, the versatility, the gaiety, the traditions, the sentiment, and the solidarity of the Oregon Agricultural College.

The Oregon Countryman. This is an illustrated monthly magazine, published by the Agricultural and Home Economics students under the supervision of the faculties of these courses. It is designed to be of special service to the farm home. Besides dealing with the work of the various College departments in a practical manner, it contains articles of scientific value contributed by the Experiment Station workers. Successful men and women of the State contribute articles for each issue.

The Student Engineer. This is a magazine devoted to engineering and mechanic arts. Its purposes are to record the engineering progress in the Northwest; to furnish news; to discuss methods relating to the mechanic arts; to publish records of scientific work done by the student in this institution; and to publish any matter of special technical and scientific interest. Items of interest will be found for civil, mining, mechanical, and electrical engineers, for foresters and others engaged in technical pursuits. The journal is under the supervision of the faculties of the Schools

of Engineering, Mining, and Forestry, but the work and responsibilities of the publication are borne by the staff, elected by the students of the school concerned.

The Commercial Print. This magazine, published each semester by the students of the School of Commerce under the supervision of the faculty of the school, is devoted to the commercial interests of the College and State. Articles of merit are contributed for each issue by students, faculty, and prominent business men of the State. One distinguishing feature of the magazine is the publication each semester of a complete directory of all the members of the institution, students, faculty, and employees.

The O. A. C. Alumnus. This is a quarterly periodical edited and issued for the Alumni Association by the Secretary of the General Alumni Association of the Oregon Agricultural College, whose office is at the College.

STUDENT EXPENSES

GENERAL FEES

Tuition is free to all students, regardless of the place of residence. The regular College fees, required of all students, with the exception of special students in music who take no other College work, are as follows:

Entrance fee, payable annually on registration.....	\$5.00
Incidental (Student) fee, payable each semester..	
Diploma fee on graduation.....	5.00
Binding fee for graduation thesis.....	1.00
Vocational certificate fee.....	1.00

LABORATORY FEES AND DEPOSITS

Students are charged small fees in the different laboratory courses to cover the cost of material used; and deposits are required to cover cost of breakage in laboratory courses where breakages are likely to occur. These fees are payable at the beginning of each semester. At the end of the semester, deduction is made for actual breakage, and the balance of the deposit is refunded to the student. The fees and deposits charged each semester in the different courses are as follows:

Animal Husbandry:		Fees	Dep.
Courses 1, 16, 15, 250, 260, A.....		.25	
Courses 2, 101, 102, B, F.....		.50	
Course D		1.00	
Course 103		4.00	

Art and Architecture:**Art**

Courses 102, 103, 204, 205, 206, 305, 306, 411, 412, 505, 506 .....	.50	
Courses 600, 601, 602, 603.....	1.00	2.00
Courses 413, 414.....	2.00	

Architecture

Courses 518, 533, 535, 536, D. A. 501, 502.....	.50	
Courses 601, 602, 604, 701, 702.....	.75	
Courses 537, 538, 603.....	1.00	

Bacteriology:

Courses 701, A.....	2.00	
Courses 103, 104, 205, 302, 304, 305, 401, 402, 501, 502	3.00	
Course 113	4.00	
Courses 112, 116.....	5.00	

Botany:

Course 37, 105 .....	.75	
Courses 24, 101, 102, 104.....	1.50	
Courses 111, 116, 118.....	2.00	
Course 50	3.00	2.00
Courses 30, 31, 41, 42, 70.....	2.25	.50
Course 71	3.00	.50
Courses 36, 52, 67, 68, 69, 73, 75.....	2.25	

Chemistry:**All Laboratory Courses**

Fees.....	One dollar per credit hour
Deposits.....	Two dollars per course

Commerce:

Courses 100, 101, 102, 103, 107, 404, 405, 410-a, 416, 417, B, C.....	1.00
Courses 400, 401, 402, 403, 410, 411, 412, 413.....	2.00

Dairy Husbandry:	Fees	Dep.
Courses 3, 4, 7, 12, A, B, C, D, F, P.....	2.00	1.00
Courses 6, 9, H.....	1.00	
Courses 2, 10.....	.25	
Courses 14, 1.....	3.00	2.00
Course 30.....	2.00	
Course 5.....	.50	

Engineering:**Chemical**

Courses 301, 402.....	4.50	2.25
Courses 302, 401.....	7.50	3.75
Course 404.....	2.00	

Civil

Courses 107, 111, 511.....	.50	
Courses 222, 223, 225, 232, 235, 242, 243, 252, 254, 256, 272, 274, 513, 514, 515, 516, 557, 621, 622.....	1.00	

Electrical

Courses 201, 202, 203, 204, 403.....	2.50	3.00
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Experimental

Courses 210, 238, 255, 262, 265, 272.....	2.00	
Courses 201, 202, 203, 204, 205, 206, 207, 208, 225, 231, 232, 233, 235, 241.....	3.00	
Courses 291, 292.....	Arrange	

Highway

Course 415.....	1.00	
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Irrigation

Courses 204, 303, 305, 402, 501, 701, 802.....	1.00	
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Entomology:

Courses 301, 302, 303, 304, 305, 310, 311.....	1.00	
Course 316.....	2.00	

Farm Crops:

Courses 1, 5, 9, 11, 13, 15, 19, 22, A, B, C.....	.75	
Courses 23, 24.....	Arrange	

Farm Management:

Courses 1, 11.....	1.00	
Courses 3, 7, A, B.....	.50	

Farm Mechanics:

	Fees	Dep.
Courses 1, 9, A.....	1.50	1.00
Courses 3, 5, 13.....	2.00	1.00
Course 7	1.00	1.00
Course 15	2.00	

Forestry:

Courses C, D, E, F, 505.....	1.00
Courses 201, 202, 203, 204, 205, 206, 307, 503.....	1.50
Courses 301, 303, 304, 305, 316, 317, 318, 501, 506, 507, 508	2.00
Courses 306, 502	3.00
Courses 308, 601, 604, 605, 606.....	4.00

Horticulture:

Courses 201, 401.....	.50
Courses 103, 104, 105, 127, 128, A, B.....	1.00
Course 101-a.....	1.50
Course 115	3.00

Household Art:

Courses 100, 104, 105, 106, 203, 205, 501, R, S....	1.00
Courses 301, 701, T.....	1.50
Courses 405, 407.....	3.00

Household Science:

Courses 510, L.....	.50
Course 120	1.50
Courses 210, 515, M.....	2.00
Courses 190, 191.....	2.50
Course 100	3.00
Courses 201, 203.....	4.00
Courses 106, 107, H, I.....	6.00
Course 530	5.00 a week

Industrial Education:

Courses 165, 167.....	1.50
Courses 164, 166.....	.50

Industrial Arts:	Fees	Dep.
Courses 106, 133, 202.....	2.00	1.00
Courses 152, 153, 228.....	2.00	
Courses 110, 111, 113, 116, 131, 132, 134, 138, 203, 206, 207, 208, 209, 212, 215, G.....	4.00	1.00
Courses 151, 154, 155, 156, 158, 171, 173, 175, 270, L.....	4.00	
Courses C1, C2, C3, D1, D2, D3, E1, E2, E3, F1, F2, F3, T1, T2, T3, U1, U2, U3.....	8.00	1.00
Courses J1, J2, J3, K1, K2, K3, M1, M2, M3, N1, N2, N3, P1, P2, P3, Q1, Q2, Q3.....	8.00	
Courses 103, 104, 135, 136, 205.....	6.00	1.00
Course 174	6.00	

Mining:

Courses 135, 137, 161, 171.....	1.00	
Courses 111, 112.....	3.00	
Course 401		20.00
Courses 212, 323.....		2.00
Courses 301, 324, 330, 423.....		5.00

Pharmacy:

Courses 130, 131, 140, 141, K, L, M, N.....	1.00	
Courses 118, 152, 170, E, F, S.....	6.00	1.00
Courses 121, G.....	4.00	
Courses 160, 161.....	3.50	

Physical Education:

All courses	1.50	
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(All students using the Gymnasium pay the fee of \$1.50 per semester, for which they are given use of all equipment, baths, and are furnished with towels, soap, and medical supplies for injuries.)

Physics:

All courses except 220.....	2.00	
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Poultry Husbandry:

Courses 1, 2, 3, 4, A, B.....	1.00	1.00
Courses 6, 9.....	1.00	

Soils:	Fees	Dep.
Courses 5, 103, 105, A.....	1.00	1.00
Course C	1.00	
Courses 1, 2, 3, 7, 15, 16.....	1.00	2.00
Courses 9, 13, E, G.....	.50	
Courses 101, 107, 109, 117, 121, 123.....	.50	1.00
Veterinary Medicine:		
Courses 3, 4, 11, 14, B, C.....	.50	
Courses 2, 5, 6.....	1.00	
Course 1.....	2.00	
Zoology:		
Courses 106, 107, 120, 122.....	.25	
Courses 110, 111.....	1.00	1.00
Courses 101, 102, 108, 109, 114, 115, 116, 201, 202, 207, 208, A.....	1.50	1.00
Courses 104, 105.....	2.00	3.00
Courses 113, 205, 209.....		3.00

BOARD AND ROOM

Women's Dormitories. Waldo Hall and Cauthorn Hall, with their large airy parlors and halls, are pleasant residences for the young women who come from distant homes. The buildings are supplied throughout with pure mountain water, both hot and cold, electric lights, steam heat, and all modern conveniences. The rooms are furnished with an iron bedstead, a mattress, a chiffonier, a table, and chairs. Such other materials as are needed to make the furnishings complete, including pillows, pillow cases, sheets, blankets, bedspreads, and towels, are furnished by the student; and many of the students prefer to make the rooms more home-like by bringing rugs, curtains, pictures, sofa cushions, etc. These latter articles, however, are not at all necessary. The rooms are cheerful and comfortable without additional furniture. The bedrooms average about 12 feet by 15 feet, with one window 3 feet by 7 feet. Many of the rooms are larger, and a few of them have two windows. Most rooms are furnished with single beds, but a few double ones are available. There are a limited number of single rooms in each hall. Preference for single rooms should be indicated early. The many advantages of having a roommate should not be overlooked by the student in making her plans for college life.

The conditions of living in Waldo Hall and Cauthorn Hall are such that the College considers it a distinct advantage to the women students to live in these halls of residence. A wholesome, busy student atmosphere is maintained. Reasonable freedom is allowed, but week nights are reserved for study. All girls entering the College are expected to live in one of the dormitories, unless their parents reside in the city, or they are given special permission from the Dean of Women to live elsewhere. This permission must be obtained from the Dean of Women previous to registration.

The expenses of living for each student in the dormitories are as follows:

Room deposit	\$ 3.00
Room rent for each semester—	
Single room	20.00
Double room	10.00
Board per week, payable monthly in advance	4.00
Incidentals, such as laundry fee, electric iron fee, etc., for each semester.....	2.00

The room deposit of \$3.00 must be sent to the Registrar at the time of application for a room. When the student withdraws from College, this deposit will be refunded, upon presentation of the receipt, if no damage has been done to the room or furnishings.

Women students are not expected to arrive in Corvallis until the day the Halls are opened.

The dormitories will open for students September 22, 1918, the day preceding the first registration day.

Private Board for Men Students. No dormitory accommodations are available for men students. Board and room may be secured in private families in the city of Corvallis for from \$4.00 to \$5.50 per week. Good accommodations for self-boarding, or for club-boarding, can also be secured in the city. By clubbing, or renting rooms and boarding themselves, students materially reduce the cost of living. Students, however, will not be permitted to live at places not approved by the Faculty.

Lists of private boarding places can be secured from the Secretary of the Y. M. C. A. after the student arrives at the College.

PERSONAL EXPENSES

The personal expenses of students vary. Many students are able to go through the college year on a comparatively small income.

Questions of personal thrift, discrimination in values, and established habits are determining factors here. Each man, immediately upon registration, is required to supply himself with a military uniform, the cost of which is normally as follows: Suit and cap, \$11; leggins, 90c; hat band and breast cord, \$1.15; ornaments, 85c; gloves, 40c pair; total, \$14.30. The U. S. Government pays each cadet \$14.00 a year to provide himself with this uniform. Tan shoes (the regulation style, costing \$3.75) and a drab shirt (costing \$2.00) are appropriate elements of the uniform. The uniform is very serviceable and is more economical than civilian clothing; with reasonable care, it should serve for two or more years.

Men in physical education are expected to supply themselves with a gymnasium suit and the regulation gymnasium shoes. The cost of the gymnasium uniform complete, including shoes, need not exceed \$2.75.

In physical education women are required to provide themselves with a gymnasium suit, consisting of blouse-waist and bloomers of regulation style, and with regulation gymnasium shoes. Good second-hand uniforms of outgoing girls will be on sale for about \$4.00, while new uniforms cost \$5.00. These suits should be ordered at the gymnasium office at the time of registration.

COST OF A YEAR IN COLLEGE

One of the most perplexing questions that confronts a prospective student is what the course is going to cost him a year. The necessary cost of a year at the College will vary slightly with the particular course pursued by the student. In general, it may be said that the necessary cost per annum, exclusive of the three personal items of clothing, carfare, and amusements, averages about \$224. An estimate of this average cost for the main expense items is given below. The cost for room and board is estimated at a safe average price. The board and room items are sometimes

slightly reduced, where two students occupy the same room or where boarding clubs are economically managed.

Registration fee	\$ 5.00
Incidental (Student) fee	10.00
Laboratory fees and deposits.....	18.00
Textbooks and supplies	26.00
Board (for eight months).....	*160.00
Room rent (nine months)	36.00

In addition to the above, would be the cost to men of the military uniform and the regulation gymnasium suit, and to women of the gymnasium suit and shoes. Uniforms, however, as already indicated, should serve for more than one year. Personal expenses such as clothing, railroad fare, laundry, etc., vary greatly with the individual.

It is not recommended that any student come to the College without sufficient funds available to purchase his books and college stationery for the entire semester, pay his first month's board and room rent in advance, and pay his first semester entrance fees. For the average student, this initial outlay will be approximately \$70.00, the balance of the annual expenses being distributed about evenly throughout the remaining months of the school year.

Persons desiring more detailed information on the question of expenses for students in various departments should write to the Registrar, Corvallis, Oregon, for a bulletin on "Student Expenses."

SELF-SUPPORT

A considerable number of students manage, in one way or another, to earn the whole or a part of their expenses while attending the college. Such opportunities occur in the line of office and laboratory assistance, personal services of numerous kinds, the management of various student enterprises, agencies for laundries, etc.

The Student Employment Bureau, in charge of the Young Men's and Young Women's Christian Associations, registers without charge all students who apply for employment. It is the purpose of the Bureau to try to supply work, regular or occasional, to all who need it. In general, the demand for work on the part of students exceeds the supply that the Bureau has available;

* On account of Christmas and other vacations which most students spend at home, the cost of board is estimated for eight months only.

therefore the attention of new students who intend to earn the whole or part of their living is called to the following results of past experience.

1. The applications received during summer will be given first attention; but no student should expect to be able to secure employment by correspondence.

2. There is a constant over-supply of those wishing to do teaching and clerical work. None but those having superior qualifications and experience are likely to secure employment the first semester.

3. There is a considerable demand for efficient stenographers; also for men and especially women students who can do domestic labor of any kind; board and room rent may be earned by table service, dish washing, general housework, house cleaning, gardening, etc.

4. Students who can do any kind of domestic or manual labor well, and who have thoroughly good health, can earn their board by three hours' work a day, or board and room by four hours' work a day. But no student should come to the College without resources sufficient for the expenses of one semester. (See "Personal Expenses.") Work of any kind is much more readily secured after the student has had opportunity of becoming familiar with local conditions.

5. No student should come expecting to earn money if he can do nothing well; skill is essential, as competition is quite as severe in the College community as elsewhere.

6. Opportunities for earning money during the summer vacations can usually be counted on, the demand for forest rangers, for field workers in engineering and mining, for skilled workmen in engineering shops, factories, canneries, and hop-yards, and for horticultural, farm, and forestry laborers, being most constant.

Upon arrival at the College, new students should report for information to the Information Bureau of the Young Men's and Young Women's Christian Associations.

Women students desiring work in the Dormitories should apply early to the Housekeeper of the Women's Dormitories.

The Dean of Women will be very glad to give any information to parents and prospective students about the work of the women at the College at any time. Office, Room 107 Home Economics Building.

HEALTH SERVICE

The College Health Service, inaugurated in 1916, is a department maintained with the aim of promoting the health of all the students. This aim is sought through medical examination, through consultation during office hours, through attendance of the Medical Adviser upon those in hospital and those ill at their residences, through sanitary inspection, and through supervision in case of epidemics. The services of the department, except in so far as the welfare of the College community may require, are not imposed upon any student or group of students. They are available, however, to all students who seek them voluntarily.

The department staff comprises a regular full-time physician, the Medical Adviser, who has his headquarters at the Health Service building, and a resident graduate nurse, who is in attendance at the same building.

The Health Service is maintained by funds derived from regular student fees, twenty-five percent of such fees being devoted to this purpose. The Medical Adviser may be consulted during office hours by any student. He will give medical examinations by appointment, and medical advice and attention to those who are ill. He will be in attendance at all important athletic events on the campus to render aid in case of emergencies. He will authenticate excuses from College work because of illness.

Patients who require hospital service will be attended, on request, by the Medical Adviser, as in other cases of illness; but will be responsible for all hospital fees. Patients requiring X-ray examinations of the Health Service will be responsible also for the cost of the X-ray pictures.

STUDENT LOAN FUND

Through the liberality of friends of the Oregon Agricultural College, and through the accumulation of interest on loans, an irreducible student loan fund aggregating \$7,100.00 (March 1, 1917), has been established. The purpose, as expressed by one of the donors, is "not to induce students to attend school by providing money that can be easily obtained, but rather to aid those who have determined to secure an education and are paying the cost wholly or in part from their own earnings."

The fund consists of the following contributions:

1. One thousand dollars (\$1,000) from Hon. R. A. Booth of Eugene, restricted to students studying:

(a) Agriculture in its various phases, with a view to becoming producers from the soil.

(b) Such branches of mechanics as properly relate to agriculture.

(c) Home Economics.

2. Five hundred dollars (\$500) known as the Ashby Pierce Student Loan Fund.

3. One thousand dollars (\$1,000) from the Domestic Science Dining Room at the P. P. I. E., restricted to the use of women students.

4. Four thousand six hundred dollars (4,600), without restriction, from accumulated interest and from various College organizations, such as Folk Club, Philadelphian and Feronian Literary societies, the Barometer, the Oregon Countryman, the Cosmopolitan Club, the Faculty, the Alumni, the Christian Associations, the Winter Short Course students of 1914, the Graduating Class of 1915, Chapter A. of P. E. O., Portland, and by various individuals including Mrs. Clara H. Waldo, Portland, Hon. Thomas Kay, Salem, Hon. James Withycombe, and W. D. Wheelwright.

L. J. Simpson Scholarship Loan Fund. The College has received a gift of \$2,000 from Mr. L. J. Simpson of North Bend, Oregon, whereby five annual scholarship loans of \$100 each, continuing throughout the four years of the student's college course, will be awarded to worthy students whose needs justify the awards. The administration of the L. J. Simpson Scholarship Loan Fund is in the hands of the regular Student Loan Fund Committee, to whom applications should be made.

The J. T. Apperson Agricultural College Educational Fund. By the will of the late Hon. J. T. Apperson, Regent of the College since its foundation, a fund amounting to between twenty-five and forty thousand dollars, is to be a perpetual endowment, administered by the State Land Board of Oregon, for the assistance of worthy young men and women, "who are actual bona fide residents of the State of Oregon, and who would otherwise be unable to bear the expense of a college course at the Oregon Agricultural College." The income from this estate is to be loaned to students

at a low rate of interest. Applicants for loans must be recommended to the State Land Board by the President of the College and the State Superintendent of Public Instruction.

PRIZE FUND

The Clara H. Waldo Prize of one hundred dollars is an award annually made in the proportions of forty, thirty, twenty, and ten dollars respectively, to the woman of highest standing registered as a regular student in one of the degree courses in the senior, junior, sophomore, and freshman year. In the distribution of the prizes, the committee having charge of the awards is guided by the following points:

- (a) Proficiency in literary and scholastic attainments.
- (b) Success in student activities.
- (c) Qualities of womanhood.
- (d) Qualities of leadership.

THE FAWCETT CUP

A loving cup, the gift of Mrs. Mary E. Fawcett, Dean of Women, is awarded each year to some one of the women's organizations of the College as a prize for the particular number of the Girls' Stunt Show which, in the estimation of three judges, possesses in the highest degree the qualities of simplicity, promptness, brevity, originality, attractiveness, and finish. The entertainment is made up of individual stunts contributed by the women's organizations of the College, whose presidents elect a manager of the show. The proceeds are awarded chiefly to the Y. W. C. A., though any funds in excess of two hundred dollars annually may be diverted, by vote of the executive committee, either wholly or in part, to some other worthy enterprise that affects the interests of all the College women.

ADMISSION TO THE COLLEGE

A student who wishes to be admitted to the Oregon Agricultural College may do so in one of two ways: (1) by examination, (2) by certificate.

Students who seek admission by examination must present themselves for examination at the College on registration days, September 23 and 24.

Students who seek admission by certificate may do so in one of the following ways:

For admission to the Vocational Courses. By presenting properly certified evidence of the completion of the equivalent of an eighth-grade course of study in the public schools, and by meeting the other requirements for admission specified in the paragraph on Vocational Courses, under Entrance Requirements.

For Admission to the Degree Courses. By presenting properly certified evidence of the completion of four years of the course of study (15) units in high school, and by meeting the other requirements for admission specified in the paragraph on Degree Courses, under Entrance Requirements.

For Admission as a Special Student. By presenting properly certified evidence of suitable preparation for the studies desired, and by meeting the other requirements specified under Special Students

For Admission as an Optional Student. By presenting properly certified evidence of meeting all the regular entrance requirements to degree courses, and by meeting the other requirements specified under Optional Students.

For Admission to Advanced Standing. By presenting properly certified evidence of the completion, in other institutions of recognized standing, of such work as is equivalent to corresponding work required in the College courses, and by meeting the other requirements specified under Advanced Standing.

For Admission to Graduate Study. By presenting properly certified evidence of graduation from this or other educational institutions of equal rank, and by meeting the other requirements for admission specified under Graduate Study.

ENTRANCE REQUIREMENTS

Vocational Courses

For admission to the vocational courses in Agriculture, Dairying, Forestry, Home Economics, and Commerce, applicants must be at least 18 years of age, and in addition to having completed the eighth-grade course of study, or its equivalent, must be of good moral character. For admission to the vocational course in Mechanic Arts, applicants must be at least 16 years of age, and in addition to having completed the eighth-grade course of study, or its equivalent, must be of good moral character. Applicants who have not completed the eighth-grade course of study, but who are 21 years of age or over, and of good moral character, may

be admitted to any of these vocational courses at the discretion of the dean of the school in which the work is to be carried on. For admission to the vocational course in Pharmacy, applicants must be at least 18 years of age, and in addition to having completed two years of high-school work, or its equivalent, must be of good moral character. For a statement of the length and character of the vocational courses, see index on Courses of Study.

Degree Courses

Applicants for admission to the degree courses must be 16 years of age or over and of good moral character. The fifteen units required for entrance, distributed in the most advantageous way for admission to the various College courses in Agriculture, Home Economics, Forestry, Engineering, Mining, Industrial Arts, Commerce, and Pharmacy, are indicated in the table entitled "Prescribed Units for Admission." If the distribution of units presented by the matriculate does not correspond to that recommended, as indicated by the table, the student will be required to carry in College the courses lacking in his secondary credits, in order to make up his deficiency.

A unit, as referred to in the table, implies one high-school subject carried for five 45-minute periods a week throughout the school year.

Prescribed Units for Admission	Agriculture	Home Economics	For. & Log. Engineering	Engineering*	Commerce	Pharmacy
English	3	3	3	3	3	3
Mathematics—						
Algebra	1	1	1½	1½	1	1
Plane Geometry	1	1	1	1	1	1
Solid Geometry	0	0	0	½	0	0
Electives	10	10	9½	9**	10	10
Total units	15	15	15	15	15	15

The electives listed in the table may be selected from any of the subjects offered in the "Oregon Course of Study" for high schools.

* Includes Mining and Industrial Arts.

** It is suggested that while physics is not prescribed as an entrance requirement in Engineering, students who are preparing to enter any of the Engineering courses take a year's work in high-school physics where this work is available.

While History and Foreign Languages are not prescribed by the College as entrance requirements, students are urged to pursue these subjects in the high school. For credit involved in this work, see Advanced Standing.

To be admitted as a conditioned freshman, a student must not lack more than two of the total number of entrance units.

In English. Admission to the English courses of the freshman year is by certification from accredited secondary schools. When an applicant cannot furnish such certification, his admission to the freshman courses is conditioned on his passing an examination in essentially the following tests:

1. To test his power of written expression, he will write one or more compositions on a subject, or on subjects, suggested by his personal, school, community, or literary interests.

2. To test his power of oral expression, he will read at sight, in the presence of the Examiner, passages of prose, or of poetry, or both, with accuracy and effectiveness. He will also be expected to talk intelligently in good English, on some assigned subject adapted to his ability.

3. To test the range and character of his reading, and his power of appreciation, he will be expected to answer a number of simple questions on standard classics and contemporary literature not previously prescribed. He will also be expected to explain the meaning of several passages of prose and of poetry of moderate difficulty, selected from books not previously prescribed.

Whether the applicant be admitted by certification or by examination, the English department will, whenever it deems such a course advisable, deal with the student as in a probationary relation.

In case the work of such student should, at the expiration of thirty days after matriculation, fail to conform to the standard set for creditable freshman work, he may be required to make up his deficiencies in English.

Candidates presenting exercise books containing compositions or other written work properly certified to by the instructor, will be given credit for such work.

In Mathematics. The entrance requirements in Mathematics for students entering any of the degree courses in College; namely, one unit in Algebra and one unit in Plane Geometry, will be satisfied by the applicant's ability to pass a satisfactory examination in the following topics:

(a) In Algebra, addition, subtraction, multiplication, and division of positive and negative numbers; use of parentheses, factoring, highest common factor, lowest common multiple, fractions, fractional and literal equations, simultaneous equations, problems involving linear equations with one or more unknown numbers, graphical representation of simultaneous linear and quadratic equations, involution, evolution, theory of exponents, radical expressions.

(b) In Plane Geometry, the five books of Wentworth's Plane Geometry, or any other standard text on the subject. That the student may be trained to think for himself and not be dependent upon the published proofs of the text, much importance is based upon the proving of original exercises. It is distinctly advised that students preparing for entrance examination in Geometry devote considerable time to the study of original exercises.

The entrance requirements in Mathematics for students in the schools of Forestry, Engineering, and Mining demand an additional semester's work in Algebra, including quadratic equations, problems involving quadratic equations with one unknown number, equations in the quadratic form, factoring of quadratic equations, solution of quadratic equations by factoring, simultaneous quadratic equations, problems involving simultaneous quadratic equations with two unknown numbers.

The entrance requirements in the School of Engineering demand also, in addition to the specifications above, one semester's work in Solid Geometry, such as that presented in Wentworth's Solid Geometry, or any standard text on the subject.

ACCREDITED SCHOOLS

Students who have completed four years of high-school work in a high school recognized as standard will be admitted to the degree courses on presentation of a signed statement of the principal, showing work completed. It is recommended that the Certificate of Record blank issued by the Oregon Agricultural College be used. Copies will be sent by the Registrar on the application of either student or principal. These blanks must be filled out and signed by the principal or other authorized official of the school. The certificate, so authenticated, should be filed with the Registrar of the College on or before September 18, 1918. Certificates will not be rejected at a later date but acknowledg-

ment of the receipt of such certificate will be made by the Registrar up to and including September 18 only. Students sending certificates at a later date will likely be delayed in completing registration.

SPECIAL STUDENTS

Students who have presented satisfactory evidence of suitable preparation for the studies they desire, who are 18 years of age, and of good moral character, may be admitted as special students, provided they have never applied for admission and been rejected.

Special students may be allowed to graduate in any of the courses, on condition that they complete the required work.

Special students are expected to select their studies from courses open to freshmen. If they desire to take studies to which only advanced students are regularly admitted, they must show some special preparation or special necessity for such courses.

Candidates applying for admission on the above basis should file with the Registrar before September 18, 1918, a detailed statement of their preparatory work.

OPTIONAL STUDENTS

Students who have presented satisfactory evidence of meeting all the entrance requirements for the freshman class, who are of mature years and of good moral character, may be admitted as optional students, provided they furnish satisfactory evidence that they are unable, because of poor health, or outside business, or professional duties, to take a full course. They should file with the Registrar, before September 18, 1918, a certified statement of all preparatory work.

ADVANCED STANDING

Students matriculating in the degree courses with more than the number of credits required for entrance to the freshman class, will be given advanced standing for such credits as represent work beyond the full four years high-school course, that is, work taken in the graduate year, and are equivalent to the requirements of the course in which the student matriculates.

No credit will be allowed for any Science or Foreign Language carried for less than one full year.

ADMISSION FROM OTHER COLLEGES

Any student who has attended another college or university and desires to enter the Oregon Agricultural College, should file with the Registrar, on or before September 18, 1918, an official certificate from the college from which he wishes to transfer, giving evidence of: (1) his honorable dismissal; (2) a detailed statement of the entrance credits presented at the time of his matriculation at the other college; (3) a detailed statement of the work pursued while in attendance at that college; and (4) a marked copy of the catalogue of the institution, showing by conspicuous markings the courses which he completed.

REGISTRATION

All candidates for admission should file with the Registrar a certificate of their preparatory record on or before September 18, 1918. Certificates of preparatory work will not be rejected at a later date, but applicants cannot expect to receive formal acknowledgment of their receipt by the Registrar. Applicants sending in their certificates late may be delayed at registration time. Blank forms for such records may be secured from the Registrar. Such candidates should present themselves for registration at the College on September 23 or 24, 1918. Registration at a later date will be permitted only on presentation of a satisfactory reason for the delay.

Students who have not before registered at the College are advised to reach Corvallis not later than September 21, 1917, in order that they may secure a boarding and rooming place before the first day of registration.

GRADUATION

The degree of Bachelor of Science in Agriculture, in Forestry, in Logging Engineering, in Home Economics, in Electrical Engineering, in Irrigation Engineering, in Highway Engineering, in Mechanical Engineering, in Mining Engineering, in Ceramic Engineering, in Chemical Engineering, in Commerce, in Pharmacy, and in Industrial Arts, is conferred upon those who have satisfactorily completed the respective four-years courses which in the aggregate comprise 136 credits of College work. A graduate in any of the courses receives the bachelor's degree in any other course by completing the studies required in that course.

The degree of Graduate in Pharmacy is granted to those students in Pharmacy who complete specified work meeting the requirements of the American Conference of Pharmaceutical Faculties.

A certificate will be granted those students who complete the Vocational Course in Agriculture, Dairying, Home Economics, Mechanic Arts, Commerce, or Pharmacy.

GRADUATE STUDY

The Oregon Agricultural College offers to its graduates and to those of other institutions of equal rank, work in Agriculture, Home Economics, and Pharmacy leading to the degree of Master of Science, and work in Engineering, Mining, and Forestry, leading to the usual professional degrees.

This work is done in the several departments of the College under the general supervision of a standing committee of the Faculty known as the committee on "Graduate Students and Advanced Degrees."

REQUIREMENTS FOR THE HIGHER DEGREES

Candidates for any one of the higher degrees will be required to complete a certain minimum of resident work, to prepare a suitable thesis, and to pass an oral examination.

The resident work is planned so that it may be completed in a single year by a student who devotes full time to his studies; it consists of a minimum of 32 credits, including the preparation of the thesis. Graduate credit from other institutions will not be accepted as reducing this minimum of 32 credits. One credit requires approximately three hours of the student's time each week for one semester. From 16 to 24 of these credits will be devoted to the thesis and to allied subjects in the same department, and will constitute the candidate's major. From 8 to 16 of these 32 credits will be selected from other departments of the College and will constitute the minor. Undergraduate work may, at the discretion of the committee, be taken as part of the minor, but when so taken, the number of credits allowed for any course will be reduced to two-thirds of the number listed in the catalogue, the assumption being that the candidate can, in work of that grade, accomplish as much in two hours as the average undergraduate in three. No course which is contained in the curriculum of any high school of the State of Oregon, nor any course regularly covered

in the Freshman and Sophomore years of this College shall be allowed as credit toward an advanced degree; and no credit shall be allowed toward the major for any regular undergraduate course. All graduate students taking regularly announced courses must attend the examinations given as part of such courses.

The thesis must embody the results of investigative, though not necessarily original, research, and a typewritten copy of the thesis, prepared according to the specifications of the committee, must be deposited with the chairman of the committee not later than two weeks prior to the date set for commencement of the year in which the degree is desired.

After the thesis has been deposited, the chairman will appoint a special examining committee and set a date for the oral examination. This special committee will consist of: (1) the one or more professors in charge of the major; (2) the one or more professors in charge of the minor; and (3) one or more members of the Committee on Graduate Students and Advanced Degrees. The report of this committee will be presented to the College Council by the chairman of the Committee on Graduate Students and Advanced Degrees. The chairman will deposit the thesis of successful students with the Librarian as soon as possible after the oral examination.

Higher degrees will be conferred only at the regular commencement exercises, but the committee may under exceptional circumstances allow the candidate to be absent from such exercises.

ADMISSION TO THE COLLEGE AS A GRADUATE STUDENT

All students who have been graduated from four-years courses in the Oregon Agricultural College or in other colleges of equal rank, will be considered graduate students and will be registered as such by the Registrar. Graduate students will be required to present credentials to the Registrar as specified under "Admission from Other Colleges."

FEEES

Graduate students will pay the same entrance, incidental, diploma, and binding fees as undergraduates. Laboratory fees will in each case be determined by the head of the department concerned, and must be paid at the beginning of the semester in which the laboratory work is done.

SCHOOLS AND DEPARTMENTS

SCHOOL OF AGRICULTURE

ARTHUR BURTON CORDLEY, Dean

The School of Agriculture offers the following courses of study: a four-years course with various options, which leads to the degree of Bachelor of Science; one-year vocational courses in General Agriculture, Horticulture, and Dairy Manufacturing; and a six-weeks Winter Short Course.

The Degree Courses. The various degree courses in Agriculture are open only to those who have completed the equivalent of four years of the Oregon State high-school course (see Admission to the College). The aim of these courses is to train young men to become successful farmers, stockmen, and fruit growers; to equip them to become efficient managers of orchard and ranch properties and of agricultural cooperative organizations; to prepare them to become specialists in some branch of agricultural college or experiment station work, or to fit them to become teachers of agriculture in the public schools. In short, they offer to those who have faith in the farm and in rural life, opportunities for individual development and technical training equal to those provided for the educated in other professions.

The various subjects of instruction may be conveniently arranged into three groups, as follows:

(a) **Sciences related to Agriculture:** Botany, Zoology, and Entomology, Chemistry, Physics, and Bacteriology; (b) **Technical Agricultural subjects:** Farm Crops, Farm Management, Farm Mechanics, Rural Architecture, Animal Husbandry, Dairy Husbandry, Horticulture, Poultry Husbandry, Soils, Irrigation and Drainage, Veterinary Medicine; (c) **Non-technical subjects:** The English Language and Literature, Modern Languages, Political Science, Rural Economics, Rural Sociology, and similar subjects.

The subjects of the first group are designed to furnish the student with an insight into the principles of agricultural science. Those of the second group teach him the application of these principles and give him also, both theoretically and practically, various subjects of agricultural technology. The subjects of the third group tend further to develop the student's intellect, broaden his view, and train him in good citizenship.

To indicate briefly the nature of the work, it may be stated that the student studies the origin, structure, fertility, cultivation, and improvement of various soils; the history, growth, culture, improvement, and value of the different field crops; the structures, machinery, drainage, and irrigation of the farm; and the history, economics, methods, and business principles in farm management. Thorough courses in Business Administration, Rural Economics and Sociology, and Political Science for Agricultural students, are given by the School of Commerce. In the course in Animal Husbandry, consideration is given to the history and characteristics of the various breeds of live stock; the principles of breeding; the principles and practice of feeding, with particular reference to conditions in this State. By constant practice in stock judging, the student is made familiar with the good points of the various breeds. In Horticulture the student studies the problems of the orchard and garden, such as choice of sites, soils, planting, pruning, choice of varieties, sprays and spraying, and thinning; he obtains instruction and practice in the propagation of plants by various methods; in the harvesting, picking, storage, and marketing of fruits; he may study the principles of plant breeding, or the construction and management of greenhouses, or the culture of small fruits and vegetables for market or canning purposes. In Dairy Husbandry he studies the secretion, composition, and separation of milk and cream; and obtains abundant practice in the use of the Babcock and other tests, in butter and cheese making, and in creamery practice. A department of Poultry Husbandry offers to students exceptional opportunities to specialize in this line. The instruction will include a study of breeds, the principles of feeding, housing, and incubation, and will be supplemented by practical work on the farm. In Veterinary Medicine the student is taught to prevent disease, diagnose existing pathological conditions, arrest outbreaks of contagious and infectious diseases among domestic animals, give medical attention in emergency cases, and take care of the sick.

In response to the demand for special teachers of Agriculture in the high schools, an opportunity is given students to major in agricultural education. Certain courses are prescribed in the junior and senior years to broaden the general agricultural training of the first two years, so that the teacher may be prepared to meet the conditions in any section of the State. Courses in Pedagogy provide the necessary principles and methods of teaching

Some election is also allowed in order that the student may specialize along the lines of his greatest interest.

Candidates for the degree of Bachelor of Science in Agriculture will pursue one of the two prescribed courses during the first two years.

Group I (See page 79) prescribes the more work in technical Agricultural subjects and leads to the more advanced work in the departments of Animal Husbandry, Dairy Husbandry, Farm Crops, Farm Management, Farm Mechanics, Horticulture, Poultry Husbandry, Soils, and Rural Architecture.

Group II (See page 80) prescribes the more work in Modern Languages and science and prescribes especially for the more advanced work in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology.

During the two remaining years of his course, each student is given the opportunity to specialize by electing major work in some one department. For graduation, sixty-six credits are required in addition to the freshman and sophomore work. Junior and senior courses other than those prescribed must be selected with the approval of the head of the department in which the major is taken.

Students who prefer not to specialize, may, with the approval of the Dean, pursue a course in General Agriculture with a wide range of electives. Junior and senior courses aggregating not less than twenty-four credits are required in the School of Agriculture. The remaining courses may be taken in any of the schools or departments of the College.

Practical Experience Required for Graduation

Those students majoring in applied Agriculture will be required to have had a certain amount of practical experience, either before entering the institution or during vacation periods, before being granted a degree. The amount of practice work necessary will be determined in each case by the head of the department in which the student is majoring.

DEGREE COURSES IN AGRICULTURE

Group I.

Freshman Year	Semester	
	1st	2nd
*Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 100, 101).....	3	3
General Physics (Phys. 1).....	3	or 3
Agricultural Botany (Bot. 41, 42).....	3	3
Crop Production (Farm Crops 1).....	3	or 3
Stock Judging (A. H. 1).....	2	
Farm Accounts and Business Methods (Com. 109).....	2	
Live-Stock Management (A. H. 2).....		3
Library Practice (Libr. 1).....		$\frac{1}{2}$
Hygiene (Phys. Ed. 10).....		$\frac{1}{2}$
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Sophomore Year

Principles of Economic Zoology (Zool. 108, 109).....	3	3
Agricultural Chemistry (Chem. 500, 501)	3	3
General Bacteriology (Bact. 103).....	3	
Principles of Fruit Growing (Hort. 101-a).....	2	
Fundamentals of Lan. Gard. (Hort. 101-b).....	1	
Vegetable Growing (Hort. 201).....		2
Soils 1, 2.....	3	3
General Farm Mechanics (Farm Mech. 1) or.....	2	
Drainage and Irrigation (Soils 101).....(2)		
Elements of Dairying (D. H. 1).....		3
Practical Poultry Keeping (P. H. 6).....		2
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	18 $\frac{1}{2}$	17 $\frac{1}{2}$

* Students proficient in English may elect a modern language or more advanced course in English in lieu of Modern English Prose.

	Semester	
	1st	2nd
Junior Year		
*Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Ins. 1, 2).....	1	1
Electives	12	15
	—	—
	17	17
Senior Year		
*National Government (Com. 320).....	3	
*State and Municipal Government (Com. 322).....		3
Electives	13	13
	—	—
	16	16

DEGREE COURSES IN AGRICULTURE

Group II.

Freshman Year

Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 100, 101).....	3	3
General Physics (Phys. 1, 2).....	3	3
Principles of Economic Zoology (Zool. 108, 109).....	3	3
Modern Language (German, French, first year).....	3	3
Library Practice (Libr. 1).....		½
Hygiene (Phys. Ed. 10).....		½
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	½	½
	—	—
	16½	17½

Sophomore Year

Agricultural Botany (Bot. 41, 42).....	3	3
Agricultural Chemistry (Chem. 500, 501).....	3	3
General Bacteriology (Bact. 103).....	3 or	3
Modern Language (German, French, second year).....	3	3
Organic Chemistry (Chem. 201).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	½	½
Electives	5	5
	—	—
	18½	18½

* Equivalent credits from any courses in the departments of English, Industrial Education, Economics, and Sociology, or Government and Business Law may be substituted.

	Junior Year		Semester	
			1st	2nd
Agricultural Economics (Com. 219).....			3	
Drill (Military 5, 6).....			1	1
Military Science (Theo. Ins. 1, 2).....			1	1
Electives			12	15
			17	17

Senior Year				
National Government (Com. 320).....			3	
State and Municipal Government (Com. 322).....				3
Electives			13	13
			16	16

In the courses in this group students may major in Agricultural Chemistry, Agricultural Bacteriology, Botany and Plant Pathology, Economic Zoology, and Economic Entomology. The purpose of these courses is to provide students with preliminary training for agricultural college and experiment station positions in these various sciences; for work in the scientific bureaus of the U. S. Department of Agriculture; for positions as fruit inspectors; and for technical positions in state and government fish and game propagation work.

Students who desire a less technical course may, with the approval of the Dean, substitute elective work for any one of the prescribed courses in each semester of the freshman year. These and other elective courses may be taken in any of the schools or departments of the College, provided only that in addition to the prescribed courses not less than twenty-four credits of junior and senior work must be taken in the School of Agriculture.

Freshman Year—Second Semester Registration	Semester	
	1st	2nd
Modern English Prose (Eng. 81).....		3
General Physics (Phys. 1).....		3
Crop Production (Farm Crops 1).....		3
Live-Stock Management (A. H. 2).....		3
Elements of Dairying (D. H. 1).....		3
Practical Poultry Keeping (P. H. 6).....		2
Drill (Military 2).....		1
Gymnasium (Phys. Ed. 16).....		½
		18½

VOCATIONAL COURSES IN AGRICULTURE

The one-year vocational courses in Agriculture are not preparatory or elementary courses. They are provided especially for those who desire to obtain as quickly as possible a working knowledge of the principles of agricultural practice. They are open to young men with or without high-school preparation, and to men of mature years and practical experience, who may desire to familiarize themselves with the most modern thought on this subject.

Three one-year vocational courses are offered: I General Agriculture (see p. 83), II Orchard Practice (see p. 153), III Dairy Manufacturing (see p. 113).

In this State there are thousands of young men who are to become our future farmers and orchardists. It is to the interest both of the individual and of the State that these young men should keep pace with the rapid development of agriculture. Each and every one should have, if possible, the opportunity of obtaining an agricultural education. Many of these young men are so situated, however, that it is impossible for them to attend any of our regular four-years courses. There are also many mature men well past the usual school age, no doubt, who desire to acquaint themselves more fully with the more recent developments in agricultural science and practice. It is to meet the needs of such men, both young and old, that these one-year courses are offered. They are designed to provide the largest amount of practical information and training that can be given in one year.

ONE YEAR VOCATIONAL COURSE

GENERAL AGRICULTURE

	Semester	
	1st	2nd
General Farm Crops I, II (Farm Crops A, B).....	3	3
Farm Machines and Engines (Farm Mech. A).....	3	
*Elementary Business English (Eng. N).....		3
Stock Judging (A. H. A).....	2	
Practical Farm Drainage (Soils C).....		2
Farm Management (Farm Mgt. A, B).....	2	2
Farm Accounting (Com. E).....		2
Diseases of Domestic Animals (Vet. Med. C).....	3	
Farm Soils (Soils A).....	3	
Feeding and Management (A. H. B).....		5
Breeding, Feeding and Management of Dairy Cattle (D. H. J).....	3	
**Home Orchard and Garden (Hort. A).....		2
Gymnasium (Phys. Ed. 11, 12).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military A, B).....	1	1
	<hr/> 20 $\frac{1}{2}$	<hr/> 20 $\frac{1}{2}$

* Students with credit for not less than one year's high-school English may elect a more advanced course.

** Farm Poultry may be substituted for Home Orchard and Garden upon request of not less than ten persons.

ANIMAL HUSBANDRY

ERMINE LAWRENCE POTTER, Professor
ORAN MILTON NELSON, Associate Professor
EDWARD BLODGETT FITTS, Assistant Professor, (Ext.)
EZRA JAMES FJELDSTED, Assistant Professor
DALE EVERETT RICHARDS, Instructor

The course in Animal Husbandry is planned to fit the student for the actual raising of live stock on the farm, so that he may produce the highest grade of stock in the most economical and business-like manner. The student is thoroughly grounded in the underlying principles in order that he may successfully continue his study after leaving college, but the practical details are thoroughly treated and a special effort is made to keep the students in close touch with the financial phases of the industry. Students who take this work as their specialty are expected not to devote their entire time to live stock; but, on the contrary, to familiarize themselves with crop production, soil fertility, and other phases of general agriculture. They are expected also to study English, Economics, Commercial Law, and kindred subjects, all of which are so essential in the training of the young man who expects to become not only an up-to-date business stockman, but a good useful citizen.

Students electing to major in Animal Husbandry must have had considerable practical experience in farming and stock raising before they will be allowed to graduate. The nature and extent of the experience required will be left to the judgment of the head of the department.

Students not majoring in Animal Husbandry but desiring to elect some work in the department, will be given careful attention to see that they get just the work fitted to their individual needs.

Equipment. The equipment of the department of Animal Husbandry consists essentially of live stock, barns, and the College stock farms. During the past year the live stock available for illustration and demonstration purposes has been very much improved in numbers and in quality. The College flocks and herds now include typical specimens of Shorthorn and Hereford cattle, Cotswold and Shropshire sheep, Berkshire, Yorkshire, Poland China and Duroc Jersey swine, Percheron, Belgian, Clydesdale, Shire, American Saddle, and Standard-bred horses, together with the live stock used in experimental work. In addition to the live

stock regularly kept on the College farm, much good stock is loaned from time to time by the leading breeders of the State. During the winter, carload lots illustrating the market classes are brought in for demonstration purposes. The department also possesses abundant maps, charts, lantern slides, stud books, a complete animal husbandry library, and other equipment for the conduct of laboratory, lecture, and recitation work.

The department has just completed what is considered the most convenient and modern hog barn in America. This building will aid materially in the instructional and experimental work with hogs.

COURSES IN ANIMAL HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Business Law (Com. 31).....		3
Animal Chemistry (Chem. 509).....	2	
Comparative Anatomy (Vet. Med. 1).....	3	
Comparative Physiology (Vet. Med. 2).....		3
Breeds of Stock (A. H. 250, 260).....	4	4
Forage Crops (Farm Crops 9).....	2	
Animal Nutrition (A. H. 7).....		2
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
Elective	4	3
	17	17
Senior Year		
Diseases of Live Stock (Vet. Med. 3, 4).....	3	3
Principles of Breeding (A. H. 6).....		3
Advanced Stock Judging (A. H. 16).....	3	
Seminar (A. H. 18, 10).....	1	1
Live Stock Economics (A. H. 110).....		3
Feeds and Feeding (A. H. 21).....	5	
Electives	4	6
	16	16

The following courses are offered:

1. Stock Judging. The various types of farm animals are studied by score card and comparative methods, and the student made familiar with the desirable and undesirable types of beef and dairy cattle, sheep, swine, and horses.

Agriculture; freshman year; first semester; 2 credits; 3 laboratory periods. Fee \$0.25. Text: Vaughan, Type and Market Classes of Live Stock.

2. Live-Stock Management. Practical details of the care and management of live stock, stabling, grooming, sanitation, practical feeding, and kindred details of live-stock farming, all with especial reference to Oregon conditions.

Agriculture; freshman year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50. Text: Potter, Live Stock Management.

6. Principles of Breeding. The principles of breeding as related to the development of our domestic animals; variation, transmission of variations and modifications, fecundity, inbreeding, crossing, and like topics.

Prerequisites: Botany 41 and 42; Zoology 108, 109. Animal Husbandry; senior or graduate year; second semester; 3 credits; 3 recitations. Text: Walter, Genetics.

7. Animal Nutrition. The chemical and physiological principles of animal nutrition; the function of the various classes of nutrients when taken into the animal body; nutritive ratios; feeding standards; compounding rations; and the general significance of the chemical composition and energy value of feeds.

Prerequisites: Chemistry 500 and 501. Animal Husbandry and Dairy Husbandry; junior year; first and second semester; 2 credits; 2 recitations. Text: Henry and Morrison, Feeds and Feeding.

13. Research Work. The student is expected to select some line for individual investigation, either by library methods or otherwise. The object is: first, to allow the student to study some particular subject in which he is especially interested; and second, to give him training in working out problems for himself, such as he will have to undertake after leaving college. This course is open only to those who are taking Animal Husbandry as

their major, or who have taken practically all of the regular courses in Animal Husbandry.

Animal Husbandry; elective; senior year; first semester; credits and hours to be arranged.

14. Research Work. A continuation of course 13.

Animal Husbandry; elective; senior year; second semester; credits and hours to be arranged.

15. Stock Judging II. An elective course in the judging of all kinds of stock.

Prerequisite: A. H. 1. First semester; 2 credits; 1 recitation; 2 two-hours laboratory periods. Fee \$0.25.

16. Advanced Stock Judging. Practical judging of all kinds of live stock, with occasional trips to fairs and stock farms. Judging teams for the Pacific International Stock Show will be chosen for the most part from this class.

Prerequisites: At least four credits of stock judging. Animal Husbandry; senior or graduate year; first semester; 3 credits; 4 two-hours laboratory periods. Fee \$0.25.

18. Seminar. Weekly meetings in which papers on Animal Husbandry subjects are read and discussed. These papers are prepared under the supervision of the department, although considerable latitude is allowed in the selection of subjects and the manner of presentation.

Animal Husbandry; junior or senior year; first semester; 1 credit.

19. Seminar. A continuation of course 18.

Animal Husbandry; second semester; 1 credit.

21. Feeds and Feeding. An advanced course in the feeding of horses, beef cattle, sheep, and swine, consisting of a thorough training in the most approved methods of stock feeding. Especial study is made of the practices of the best stockmen, and of the investigations carried on by the various experiment stations. Students desiring to take only such parts of the course as relate to certain lines of live stock will be permitted to do so by arrangement with the head of the department.

Prerequisite: Animal Husbandry 7. Animal Husbandry; senior or graduate year; first semester; 5 credits; 5 recitations; Text: Henry and Morrison, Feeds and Feeding.

23. Feeds and Feeding. A condensed course intended for those students who do not have the time necessary for Courses 7 and 21. While brief, the work is complete in itself and does not depend upon any other course. The feeding of beef cattle, sheep, hogs, and horses is studied with reference to both principles of nutrition and farm practice.

Prerequisite: Animal Husbandry 2. Elective to juniors and seniors in all agricultural courses except Animal Husbandry; second semester; 3 credits; 3 recitations. Text: Henry and Morrison, Feeds and Feeding.

24. Pork Production. Feeding and Management of hogs with especial reference to dairy farm conditions.

Prerequisite: Animal Husbandry 7. Dairy Husbandry Elective; junior or senior year; second semester; 3 credits; 3 recitations.

101. Live-Stock Practice. Laboratory studies devoted to such work as dipping, dehorning, hoof trimming, shearing, horse training, and other common operations of the stock farm.

Senior Animal Husbandry students only; first semester; 1 credit; 1 three-hours laboratory period. (Note.—The department reserves the right to limit the number of students in this course.) Fee \$0.50.

102. Live-Stock Practice. A continuation of Course 101.

Animal Husbandry; second semester; 1 credit; 1 three-hours laboratory period. Fee \$0.50.

103. Horsemanship. Drill in practical handling of draft, driving, and saddle horses with a view to both farm and military work.

Prerequisite: Animal Husbandry 1 and 2. Elective; 50 hours laboratory work each semester; 1 credit. Both semesters. Fee \$4.00.

110. Live-Stock Economics. An advanced course in management dealing particularly with the economic and financial phases of live-stock production.

Animal Husbandry seniors only; second semester; 3 credits; 3 recitations.

250. Breeds of Live Stock. A study of the breeds of horses and beef cattle, their development, breeding and type.

Prerequisite: Animal Husbandry 1 or A. Sophomore year; first semester; 4 credits; 2 recitations; 2 three-hours laboratory periods. Fee \$0.25.

260. Breeds of Live Stock II. A study of the breeds of sheep and swine, their development, breeding, and type.

Prerequisite: Animal Husbandry 1 or A. Sophomore year; second semester; 4 credits; 2 recitations; 2 three-hours laboratory periods. Fee \$0.25.

300. Pedigree Study. A laboratory study of the blood lines of the various breeds of live stock. Each student is expected to select one or two breeds as the basis for special study rather than to attempt to cover all breeds.

Animal Husbandry; elective; senior or graduate year; second semester; credits and hours to be arranged.

400. Advanced Hog Feeding. A study of experimental data relating to hog feeding problems.

Animal Husbandry; elective; graduate year; second semester; 2 credits; hours to be arranged.

411. Graduate Research. Graduate students will be given opportunity to carry on research work along any lines desired. The department is especially well equipped for graduate work along the lines of experimental feeding of hogs, sheep, and beef cattle, live stock management, and all forms of library work with either experiment station or general live-stock literature.

Animal Husbandry; elective; graduate year; first semester; credits and hours to be arranged.

412. Graduate Research. Continuation of Course 411.

Animal Husbandry; elective; graduate year; second semester; credits and hours to be arranged.

A. Stock Judging. A thorough drill in the judging of beef cattle, sheep, swine, and horses, accompanied by text-book and lecture work on types and breeds of live stock.

Vocational; first semester; 2 credits; 3 laboratory periods. Fee \$0.25. Text: Vaughan, Type and Market Classes of Live Stock.

B. Feeding and Management. The practical details of the feeding, care, and management of all kinds of live stock, with special reference to practices common in the West.

Vocational; second semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$1.00. Text: Potter, Live Stock Management.

F. Animal Husbandry for the Orchard. A study of (a) feeding and handling of farm work horses, and (b) feeding and management of hogs with special reference to orchard conditions.

Vocational course in Horticulture; second semester; 1 recitation; 1 laboratory period. Fee \$0.50.

BACTERIOLOGY

THEODORE DAY BECKWITH, Professor
GODFREY VERNON COPSON, Associate Professor

Instructor

Bacteriology, although comparatively a new field of study, has become an every-day interest and has taken a place deservedly prominent among the sciences. It is essential that every student in Agriculture, Pharmacy, or Home Economics acquire at least a general knowledge of the fundamental principles of bacteriology in order to get a thorough understanding of his work.

Since technical bacteriology is usually a totally unfamiliar field to the new student, the first courses are necessarily general in character, although every effort is made towards direct application whenever possible. The work, therefore, is both theoretical and practical. Courses are commenced in the sophomore year to enable the student to continue along definite specialized lines during the junior and senior years. This thorough preparation is given along certain specific lines in bacteriology, such as Soils, Dairying, Domestic Science, Pharmacy, Sanitation, etc. The advanced work undertakes from a bacteriological point of view the problems of the major work of the student, who is trained not only in technique, power of observation, and the principles of bacteriology, but also in power of resourcefulness, initiative, and individual responsibility.

For the proper understanding of bacteriology, it is necessary to have had at least a course in general chemistry, which is a prerequisite for all students except those in the vocational courses.

Equipment. The department of bacteriology is located on the fourth floor of the Agricultural building. It occupies two large laboratories for general class work, one for special soil bacteriology and a laboratory for combined Experiment Station and Research Work. In addition there are the offices of the members of the department, a small but well-selected library including most of the authoritative works on bacteriology, besides a good list of the leading American and foreign periodicals. A dark-room, well-equipped for work in photomicrography, a store-room and large incubator room with automatically controlled temperature, is furnished for student use. The department is well supplied with the highest grade microscopes, ample glassware, both precision and common, and lead-topped desks.

Individual wall lockers, cylindrical and square copper sterilizers, supplied with steam from the main heating plant, small and large hot-air sterilizers, a large steam-pressure, horizontal sterilizer, the latter arranged for "dry-steam" sterilization, are conveniently arranged in the general laboratory for the larger sections. Small incubators are used by the advanced students. For special work demanding an extraordinary degree of exactness, there is a large electrically controlled and heated incubator. Lead-topped tables with convenient drawers furnish ample working space. Hot water, which is supplied to all laboratories, is fed by the main water system from a large hot-water tank. Sinks are uniformly lead. A high-power centrifuge is used. All the other necessary minor equipment for work in bacteriology is at the disposal of elementary and advanced students.

Major Courses. The purposes of these courses is to train students for Agricultural College and Experiment Station positions; for work in the Scientific Bureaus of the United States Department of Agriculture; for positions as Sanitary and Milk Inspectors with various State and City Boards of Health; as Laboratory Technicians for Health and Sanitary Boards and for Hospital Service; and likewise for testing laboratories for corporations, such as creameries, and producers of various food products.

Military Value. The various courses in Bacteriology are of direct value in preparation of men for the Sanitary Corps and Medical Corps of the United States Army and Navy.

COURSES IN BACTERIOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
	17	17

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

	Senior Year	Semester	
		1st	2nd
National Government (Com. 320).....		3	
State and Municipal Government (Com. 322).....			3
* Electives		13	13
		16	16

The following courses are offered:

103. General Bacteriology. A series of lectures, recitations, and experiments to familiarize students with the underlying principles of bacteriology as applied to everyday life, especially to agricultural problems; and to serve as an introduction to the more advanced courses in the subject.

Prerequisite: one year's work in chemistry. Agriculture, sophomore year; Pharmacy, junior or senior year; either semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

104. General Bacteriology. A course supplementing the lecture and laboratory work of Bacteriology 103.

Prerequisite: Bacteriology 103. Pharmacy; junior or senior year; Agriculture; elective; sophomore, junior, and senior year; second semester; 3 credits; 2 laboratory periods; 2 recitations or lectures. Fee \$3.00.

112. Advanced Bacteriology. Beginning with the first semester of the junior year, a student may elect bacteriology for the two semesters of that year, and continue advanced work through the two semesters of the senior year.

Prerequisite: Bacteriology 103. Agriculture; elective; junior year; first semester; 5 credits; 1 lecture; 2 recitations; 3 laboratory periods. Fee \$5.00.

113. Advanced Bacteriology. A continuation of course 112, the laboratory work familiarizing the student with special bacteriological apparatus and its use, and then proceeding with advanced work involving questions of pure science, as well as the application of bacteriology to professions and industries.

Prerequisite: Bacteriology 112. Agriculture; junior year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods. Fee \$4.00.

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

114. Seminar. A discussion of the most important literature on the subject.

Agriculture; seniors, juniors and graduates; 1 credit; 1 hour.

116. Research in Bacteriology. A thesis may be selected in this subject, beginning with the first semester, senior year, major bacteriology, and continuing through two semesters. The laboratory is thoroughly well equipped for research in agricultural, veterinary, domestic science, or pharmaceutical bacteriology. Work for the master's degree, either as a major or minor in the department, may be selected. The investigations are all outlined and conducted by the student in cooperation with the instructional staff of the department.

Prerequisite Bacteriology 112 and 113. Agriculture; elective; junior year; credits and hours to be arranged. Fee \$5.00.

205. Immunity and Vaccine Therapy. A study of the standard methods in vogue in the various immunity and therapeutic reactions, antitoxin formation, preparation and standardization of vaccines.

Prerequisites: Bacteriology 201, 202, or equivalents. Agriculture or Pharmacy; elective; senior or graduate year; time and credits to be arranged. Fee \$3.00.

302. Zymology and Ferments. An elective for students in Home Economics who desire a specialized course dealing with technical fermentations and microscopic structure of the yeast plant and other fermentation organisms; the preparation and manipulation of special media designed for their growth; pure culture methods used in zymology, methods of laboratory testing of commercial yeasts, both for use in breadmaking and alcohol production, the bacteriology of salt-rising bread.

Prerequisite: Bacteriology 300 or equivalent. Home Economics, or for students of other courses of equivalent preparation; elective; junior or senior year; either semester; 2 credits; 2 laboratory periods. Fee \$3.00.

304. Home Economics Bacteriology. Deals with bacteriology in relation to home life. An introduction to the subject, therefore, is made along theoretical lines, with application to sanitation and household practices. Water supply, action of septic tanks, house sanitation, control and prevention of specific diseases, fumigation, vinegar making, methods of contamination of milk, canning, treatment of wounds, etc.

Prerequisite: one year of chemistry. In its structure, this course parallels Bacteriology 103, with application to the problems of Home Economics. Home Economics; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

305. Home Economics Bacteriology. Primarily for Home Economics students in continuation of Bacteriology 304. Standard sanitary bacterial examination of water, milk, butter, cheese, meat, air, etc., certain simple clinical methods. Use and action of antiseptics and germicides.

Prerequisite: Bacteriology 304 or equivalent. Home Economics, or students from other departments with equivalent preparation; elective; junior or senior year; either semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

401. Dairy Bacteriology. History of dairy bacteriology, physiology of bacteria, chemical reactions in dairy products due to bacteriological activities; standard methods of bacterial analysis of dairy products, methods of sanitation, disinfection, diagnosis of diseases and faults of milk, control of milk-borne epidemics, preparation of commercial health drinks such as Bulgarian milk, Yoghurt, etc., discussions of milk problems.

Prerequisite: Bacteriology 103. Agriculture; senior year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

402. Dairy Bacteriology. Continuation of Course 401. A detailed study of specific problems in dairy bacteriology, practice in special technique and methods. Individual problems assigned, literature reviewed, and discussed. Course designed fundamentally to develop initiative and resourcefulness of student. Work adapted to particular needs of individual students as far as possible.

Prerequisites: Bacteriology 103 or 401; Chemistry 501 or equivalent. Agriculture; junior or senior year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$3.00.

501. Agricultural Bacteriology. The history and development of bacteriology as applied to scientific agriculture, micro-organisms in relationship to soil fertility, the destruction of organic matter and humus formation, plant food requirements and bio-chemicals of the decomposition changes supplying such food, soil nitrogen requirements, the nitrogen cycle, nitrogen fixation by legume bacteria, media for the isolation and growth of soil organisms, soil types from the bacteriological point of view, ammonification, nitrification, denitrification, nonsymbiotic nitrogen fixation.

Prerequisite: Bacteriology 103. Agriculture; senior year; first semester; 3 credits; 1 recitation, or lecture; 2 laboratory periods. Fee \$3.00.

502. Agricultural Bacteriology. A continuation of bacteriology 501. A detailed study of soil changes due to micro-organisms. The effect of liming, manuring, and various methods of tillage, irrigation, and drainage, the activities of sulfur and iron bacteria, cellulose digestion, reference work to certain government and station bulletins, followed by abstract writing of the same for class use and discussion.

Prerequisites: Bacteriology 103 and 501. Agriculture; senior year; second semester; 3 credits; 1 recitation or lecture; 2 laboratory periods. Fee \$3.00.

701. Poultry Disease Bacteriology. The bacterial consideration of the most common diseases of poultry, chicken tuberculosis, chicken typhoid, white diarrhoea, roup, and avian diphtheria; soil contamination, and other methods of disease transportation.

Prerequisites: Bacteriology 103, 104, or equivalent. Agriculture; junior or senior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00.

711. Military Sanitation. A discussion of the laws of sanitation as applied in military practice. A war-emergency course dealing with the sanitation of the camp, protective inoculations, the carrier problem, and other questions of like nature directly related to the health of the recruit. Open to all students; either semester; $\frac{1}{2}$ credit; 1 two-hours laboratory period every two weeks. No fee.

A. Vocational Dairy Bacteriology. This course includes the bacteriological studies of milk, butter, and cheese; examination of starters, efficiency tests of pasteurization, cooling, straining, centrifuging, etc., and the general sanitation and cleanliness of the dairy.

Vocational Dairying; second semester; 2 credits; 1 lecture; 2 laboratory periods. Fee \$2.00.

B. Preventive Medicine. A consideration of certain common diseases of the human body, their cause, path of entrance, path of exit, method of transmission, and preventive methods to be taken against them; domestic water supply, pure milk, the action of germicides and antiseptics.

Vocational Home Economics; first semester; 1 credit; 2 lectures or recitations.

BOTANY AND PLANT PATHOLOGY

HOWARD PHILLIPS BARSS, Professor
WINFRED MCKENZIE ATWOOD, Associate Professor
WILLIAM EVANS LAWRENCE, Assistant Professor
MARION BERTICE MCKAY, Assistant Professor
CHARLES ELMER OWENS, Assistant Professor
HELEN MARGARET GILKEY, Assistant Professor and Curator
of the Herbarium
JOHN TAYLOR BREGGER, Fellow
JULIET NORMA ANDERSON, Fellow

The courses offered in this department aim not only to give the student a broad knowledge of plants, their structure both external and internal, their vital activities, their relationships to their environment and their natural classification, but also to impart such fundamental and practical information in regard to plants as shall form a strong foundation for the technical work in Agriculture, Forestry, Pharmacy, and Home Economics.

The general courses are so planned as to present the principles of botany from a genuinely scientific point of view, and then to show how the knowledge thus presented applies in a practical way to the problems which the students will meet in the life-work they have chosen. In order that the different needs of students pursuing different lines of work in the institution shall be met in the best possible way, separate sections are provided and the work in each section is planned with the particular interest and needs of that section in mind.

Technical and reference books are used mainly as an aid in correlating the facts brought out by the study of the actual plant specimens in the laboratory. Living plants are used wherever possible. Drawing is made an important feature of the laboratory work, because in order to draw accurately the students must observe closely.

Exceptional opportunities are afforded students who desire to specialize in botany or plant pathology. Well-equipped laboratories and the unusually favorable location for field study and collecting, offer an attractive inducement for those interested in advanced work. Special attention will be given to students wishing preparation for teaching economic biology or botany in the secondary schools, or the teaching of botany or plant pathology in Agricultural Colleges. Training is also provided for those who wish to enter the field of investigational work in Agricultural Experiment Stations, or in the United States Department of Agriculture under

the Civil Service. Agricultural extension workers, horticultural inspectors, district agriculturists, seed analysts, and pure-food experts will find special training in Botany and Plant Pathology a most valuable asset.

Equipment. The Department of Botany and Plant Pathology occupies quarters on the second floor of the Agricultural Building at the south end. There is a lecture room provided with projection lantern. There are three general student laboratories well equipped for botanical work, compound and dissecting microscopes being provided for each student. The work in plant physiology is conducted in a laboratory provided with individual lockers and equipment for each student. The laboratory is well supplied with apparatus for general course work and for special investigation, including accurate analytical balances, coarse balances, muffle furnace, electrical ovens, apparatus for the study of the respiration of fruit, meteorological instruments, chemicals, laboratory glassware, reagents, etc. Greenhouse facilities and a dark room for experimentation are also provided. The library room contains a large number of volumes of American and foreign reference works relating to botany and plant pathology, complete sets of important scientific periodicals, increased yearly by the current numbers, and a rapidly growing collection of bulletins and papers of interest to workers and students in the department. A large room is set apart for an herbarium and here accommodation is provided for students in taxonomic botany for the rapid drying and mounting of pressed plants. In the advanced laboratory a number of desks are available for special and graduate students and the equipment for advanced work in plant histology and microscopic technique includes a large electric paraffin bath, microtomes of different types, stains, chemicals, and glassware. For advanced students in plant pathology there is available an unusually well-equipped experimental laboratory, provided with thermostatic incubators, refrigerator, inclosed culture room, transfer case, electrical dry-air sterilizer, horizontal autoclave, and steam sterilizers connected with the central steam plant. There is also a photomicrographic apparatus and an excellent equipment for photographing ordinary specimens in the laboratory or in the field. A suitable photographic dark room is provided.

For demonstration and lecture purposes, the department possesses an excellent set of charts and models, a large collection of lantern slides, photographs, and illustrative material. A museum

exhibit of botanical and plant-disease specimens of great value and interest has been got together and is easily accessible to all students.

The surroundings of the Institution are particularly favorable for botanical study. On the campus are planted an interesting variety of trees, shrubs, and ornamental plants from various parts of the world, while a great diversity of economic plants are propagated on the College farm. The country about Corvallis furnishes an interesting variety of topographic features and provides within easy distance the flora of the hill and valley, plain and mountain, meadow and forest. Of interest to students in plant pathology is a small corner of the College farm which has been set out with a great variety of fruits for the study of plant diseases.

The permanent equipment of the department includes an herbarium of flowering plants and gymnosperms of many thousand specimens which contains, in addition to Oregon forms, quite extensive collections from New Mexico, California, Washington, and Michigan. The herbarium is being rapidly enlarged, particular attention being paid to the accumulation of economic material, including the forage and shade trees of North America, agricultural plants, pharmaceutical plants, weeds and grasses. The cryptogamic herbarium includes several thousand specimens of fungi from North America and Europe, being particularly rich in parasitic forms.

COURSES IN BOTANY AND PLANT PATHOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
* Electives	13	13
	—	—
	16	16

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

The following courses are offered:

24. Botany for Home Economics Students. An introduction to botanical science as applied to the home. Brief discussion of food plants; manufacture of food substances by plants; fiber plants; structure and value of woods; relation of house and garden plants to soil, air, light, and moisture; organisms of decay in relation to preservation and storage of foods, etc.

The course in Home Economics; freshman year; first or second semester; 2 credits; 1 lecture; 1 recitation; 1 laboratory period of 2 hours. Fee \$1.50. Text: Ganong, *A Textbook of Botany for Colleges*.

30. Forest Botany. Provides the basis for an adequate understanding of the forest and of the underlying principles of forestry. The structure, reproduction, and physiology of seed plants. The microscopic study of wood. The identification of trees and shrubs in their winter condition. The characteristics and relationships of the four great plant groups. An introduction to the identification of higher plants. Continued throughout the year.

The course in Forestry; sophomore year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25; Deposit \$0.50. Texts: Gager, *Fundamentals of Botany*. Stevens, *Plant Anatomy*.

31. Forest Botany. Continuation and completion of work described under course 30. Prerequisite: Botany 30. The course in Forestry; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Deposit \$0.50. Texts: Gager, *Fundamentals of Botany*. Stevens, *Plant Anatomy*.

36. Range and Pasture Botany. Study and identification of native plants of importance for forage and pasturage and native hay, and of the stock-poisoning plants, their distribution and localization. Of interest to students of Forestry, Animal Husbandry, Dairy Husbandry, and Veterinary Science.

Prerequisite: Botany 30 and 31, or 41 and 42, or their equivalent; elective; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Text: Piper and Beattie, *Flora of the Northwest Coast*.

37. Forest Pathology. The parasitic and saprophytic fungi which attack forest trees and destroy structural timber; the effect of these organisms upon the wood, and a consideration of preventive measures.

Prerequisites: Botany 30 and 31, or 41 and 42. The course in Forestry; sophomore year; elective for others; second semester; 1 credit; 1 lecture; 1 laboratory period. Fee \$0.75.

41. Agricultural Botany. The fundamental principles of botany underlying agricultural practice. The structure, physiology, and development of higher plants from the seed to the flower. The structure and development of fruits, grains, fleshy roots, and tubers. A survey of the plant kingdom from its lowest to its highest forms with special emphasis on the groups of agricultural importance. Particular attention directed to food plants, stock-poisoning plants and the organisms causing disease in plants. A brief systematic study of agricultural and other economic plants with practice in identification. Continued through the year.

The course in Agriculture; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Deposit \$0.50. Text: Ganog, A Textbook for Colleges.

42. Agricultural Botany. Continuation and completion of work outlined under course 41.

Prerequisite: course 41. The course in Agriculture; freshman year; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Deposit \$0.50. Text: Ganog, A Textbook for Colleges.

50. Plant Physiology. An introductory course in experimental Plant Physiology designed to impart a knowledge of the life-processes of the plant as a basis for intelligent agricultural and horticultural practice. Plant nutrition, growth, and response to environment. The functions of the living cell, the intake by the plant of water and raw materials from the soil. The transportation of materials through the plant. The loss of water. The manufacture, digestion, and assimilation of food, and the process of respiration.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70, and in addition, Chemistry 500 and 501. The course in Pomology; the course in Farm Crops; and the course in Botany or Plant Pathology; junior year; elective for others; second semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Duggar, Plant Physiology.

52. Advanced Plant Physiology. Special studies of plant physiological problems of present-day interest and importance. Extensive reading and class reports on selected topics. Methods of investigating scientific literature emphasized.

Prerequisite: Botany 50. Elective; first semester; 3 credits; 1 lecture; 2 recitations; (additional credits may be taken by special arrangement). Fee \$2.25.

67. Economic Ecology. The relations between the environment and the plant. The factors affecting the distribution of plants, and the occurrence of plant associations and successions. Ecological problems of the forest, grazing range, and farm. Field studies in physiographic ecology, including the methods of plant survey.

Of interest to the student of botany, forestry, grazing, agricultural economics, irrigation and drainage, plant introduction, geology, and to all who expect to enter State or Government field service.

Prerequisites: Freshman Botany, and Botany 36, 47, or 68. Elective; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25. Text: Cowle's Ecology.

68. Classification of Flowering Plants. Native Oregon flowers and common cultivated ornamental plants. Collecting, identifying, pressing, and mounting of specimens by each student.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70; elective; second semester; 3 credits; 1 lecture; 1 laboratory period; and 1 field excursion for Saturday morning. Fee \$2.25. Texts: Piper and Beattie, The Flora of the Northwest Coast. Gray, Field, Forest and Garden Botany.

69. Weeds and Poisonous Plants. The collection, identification, and classification of weeds, poisonous plants, and other economic plants.

Prerequisites: Botany 30 and 31, or 41 and 42, or 70. The course in Agricultural Education. Elective for others; second semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods of 3 hours each. Fee \$2.25.

70. Pharmaceutic Botany. A fundamental, preparatory course for Pharmacognosy and Materia Medica. A brief survey of the plant kingdom. A careful study of the structure of higher plants. The cell and cell contents. Various types of plant tissues. Work in elementary pharmacognosy with training in the microscopic identification of drugs and drug adulterants. In the spring practice is given in the identification of drug plants. Continued through the year.

The course in Pharmacy; freshman year; first semester; 3 credits; 1 lecture; 1 recitation; 2 laboratory periods. Fee \$2.25.

Deposit \$0.50. Texts: Youngken, Pharmaceutical Botany. Greenish, Food and Drugs. Mansfield, Histology of Medicinal Plants.

71. Pharmaceutic Botany. Continuation and completion of work outlined under course 70.

Prerequisite: Botany 70. The course in Pharmacy; freshman year; second semester; 4 credits; 1 lecture; 1 recitation; 3 laboratory periods. Fee \$3.00. Deposit \$0.50. Texts: Greenish, Foods and Drugs. Youngken, Pharmaceutical Botany. Mansfield, Histology of Medicinal Plants.

73. Plant Evolution and Structure. The evolution of form, structure, and methods of reproduction for all groups of plants. Evolutionary tendencies and homologies of structure and function. An advanced course dealing with fundamental principles. The detailed examination in laboratory of selected types from the lowest to the highest groups of plants.

Prerequisites: Botany 22 and 23, 30 and 31, or 41 and 42, or 70. The course in Botany; junior or senior year; elective for others; first semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$2.25. Texts: Coulter et al, A textbook of Botany. Vol. I, part 1. Coulter, Evolution of Sex in Plants.

75. Plant Histology. An advanced course. The structure, inclusions, activities, and methods of division of the plant cell; the development, structure, and adaptation to function of various types of plant tissues. The preparation of temporary and permanent microscopic mounts, including fixation, dehydration, infiltration, sectioning, and staining.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70 and 71. The course in Botany or Plant Pathology; junior or senior year; elective for others; first semester; 3 credits; 1 lecture; 3 laboratory periods. Fee \$2.25. Text: Stevens, Plant Anatomy.

80. Seminar. Required of all graduate students in Botany and Plant Pathology. Reports on advanced botanical studies. Abstracts of articles of botanical or phytopathological interest appearing in scientific journals, experiment station publications, or the agricultural press.

Elective; senior year; first semester; 1 credit will be given undergraduates regularly attending the meetings and making satisfactory reports; 1 hour session.

81. Seminar. The same as course 80 for second semester.

Elective; senior year; second semester; 1 credit as above; 1 hour.

82. Research and Thesis. For students specializing in Botany and Plant Pathology. Investigation of special problems or taking up of advanced studies not included in regular courses.

Elective; senior year; first semester; 1 or more credits (to be arranged for with instructor). Fee \$0.50 per credit.

83. Research and Thesis. Work as outlined in course 82; second semester.

Elective; senior year; second semester; 1 or more credits. Fee \$0.50 per credit.

101. Principles of Plant Pathology. Disease in plants: the causes, symptoms, effects, methods of distribution, etc. The principles of plant-disease control. Disease resistance in plants. Quarantine and inspection. Detailed examination in the laboratory of representative examples from the different groups of plant parasites. A study of various types of plant diseases, their life-histories and their microscopic appearance.

Prerequisites: Botany 22 and 23, or 30 and 31, or 41 and 42, or 70. The courses in Pomology, Olericulture, Farm Crops and Farm Management; junior or senior year; elective for others; Horticultural students are expected to enroll in section 1; Agronomy students in section 2; first semester; 2 credits; 1 lecture; 2 laboratory periods. Fee \$1.50. Text: Duggar, Fungous Diseases of Plants.

102. Diseases of Orchard and Small Fruits. The causes, symptoms, progress, and control of the important fungous, bacterial, and physiological diseases of orchard trees, and small fruits, with particular emphasis on those of importance in the Pacific Northwest. Laboratory study of specimens showing the effects of the parasite on the tissues of the host, and the microscopic appearance of the causal organisms. Frequent field excursions to demonstrate the characteristic results of different diseases under natural conditions.

Prerequisite: Botany 101. The course in Pomology; senior year; elective for others; second semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$1.50. Text: Hesler and Whetzel, Manual of Fruit Diseases.

104. Diseases of Vegetable Crops. The causes, symptoms, progress, and methods of control of the important fungous, bacterial, and other diseases of truck and garden vegetables and fruits with particular attention to those which are serious in the North-

west. Careful laboratory study of typically diseased specimens with microscopic examination of the affected tissues and of the parasitic organisms. Field excursions.

Prerequisite: Botany 101. The course in Olericulture; senior year; elective for others; second semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$1.50.

105. Diseases of Field Crops. The causes, symptoms progress, and methods of control of the important fungous and bacterial diseases of cereals and other field and forage crops, with particular attention to those of importance in the Northwest. Typical examples of the diseases are studied in the laboratory. Microscopic examination of the affected tissues and of the causal parasites.

Taken simultaneously with Botany 101, Section 2. The course in Field Crops, junior year, and Farm Management, senior year; elective for others; first semester; 1 credit; 1 laboratory period. Fee \$0.75.

111. Laboratory Methods in Plant Pathology. A training course in methods of investigation in plant pathology. Record keeping; care of collections; culture work; inoculation methods; photographic work, etc.

Prerequisite: Botany 101. The course in Plant Pathology; junior or senior year; elective for others; second semester; 2 credits; 1 lecture; 2 laboratory periods. Fee \$2.00. Text: Harshberger, Mycology and Plant Pathology.

113. Methods of Control of Plant Diseases. A lecture course on the special methods employed in the practical control of plant diseases, including the use of various fungicides for different types of diseases; the time and methods of application; surgery; sanitation; crop rotation; the development of resistant varieties; soil disinfection; seed treatment, etc.

Prerequisite: Botany 101. The course in Plant Pathology; junior or senior year; elective for others; second semester; 1 credit; 1 lecture.

116. Advanced Plant Pathology. Special studies in the field and in the laboratory of plant diseases, plant disease problems, or parasitic fungi; designed to provide training and experience in phytopathological investigations, or to extend the student's knowledge of plant diseases beyond the limits attained by the introductory courses.

Prerequisite: Botany 101. The course in Plant Pathology; senior year; elective for others; second semester; 2 or more credits; 1 lecture; laboratory periods to be arranged with instructor. Fee \$2.00.

118. Mycology. The different groups of fungi; their structure; modes of reproduction; nuclear phenomena; phylogeny and classification, with particular attention to parasitic forms.

Prerequisite: Botany 101. The course in Plant Pathology; senior year; elective for others; first semester; 3 or more credits; two lectures; 2 or more laboratory periods. Fee \$2.00. Text: Harshberger, Mycology and Plant Pathology.

Graduate Courses. Botany 52, 80, 81, 82, 83, 111, 113, 116, and 118 may be taken by graduate students as major or minor electives with full credit.

Opportunity will be given students to elect work in Economic Botany or Plant Pathology not offered in the above mentioned courses by registering in Botany 82 or 83, either as a major or minor subject. Students who elect Botany as a major must have completed the work, or equivalent, required in the freshman year of the Agricultural course.

Grazing Assistant Positions. Students preparing for grazing assistant positions under the U. S. Forest Service should take the following botanical courses: Botany 30, 31, (or 41, 42) 50, 67, 68, (or 69).

Note: Any of the courses in Botany except 24, 30, 31, 41, 42, 70, and 71, may be taken as minor electives by junior, senior, or graduate students in any course, upon consultation with the head of the department, provided the course to be elected is not regularly required in the course of study in which the student is registered.

DAIRY HUSBANDRY

PHILIP MARTIN BRANDT, Professor
VINCENT CHAPPEL, Assistant Professor
EDWARD BLODGETT FITTS, Assistant Professor (Ext.)
EDGAR LEROY WESTOVER, Assistant Professor (Ext.)
PAUL STANLEY LUCAS, Instructor
LEON WALTON WING, Jr., Instructor
HAROLD RAY TAYLOR, Assistant

Dairy Production and Dairy Manufacturing are the courses which the Dairy department offers.

Dairying is rapidly becoming the leading animal industry of the United States. The last census report shows that there are more than twenty million dairy cows in the United States and the annual value of their products is approximately six hundred million dollars.

Since the population of the country is rapidly increasing, as is also the per capita consumption of dairy products, it seems likely that the importance of the Dairy Industry will continue to advance.

The Pacific Northwest, on account of its even temperature and abundant growth of forage crops, is peculiarly adapted to dairying; and the rapid growth of this industry is creating splendid opportunities for young men in the various fields of dairying, such as the breeding of pure-bred dairy cattle, the management of dairy farms, and the management of creameries, cheese factories, and city milk plants. There are many other openings in government work, college work, and county advisory positions for those who do not care to enter the field of practical dairying.

The production and manufacturing courses are so arranged that the student may major in one course, and yet elect enough of the other course to enable him to have a working knowledge of that phase of the industry.

In the production work, it is the intention to give the student a thorough course in the breeding, feeding, judging, care, management, and diseases of dairy cattle.

In order to meet the needs of the industry and the demand for information, the department offers the following courses: A one-year course, designed to fit students for positions as operators of creameries and cheese factories or as managers of dairy farms. A winter short course in Dairy Manufacturing during Winter Short Course. The four-years course, designed to qualify students for agricultural college and experiment station work; for inspectors of

dairy products and dairy establishments in city, state, or government service; or as managers of creameries or large dairy farms.

Equipment. The Dairy building, with its three floors and its recently installed manufacturing facilities, affords convenient and modern resources for the work of this department. In the manufacturing work, it is the intention to give the student theory and practice in the manufacture of dairy products. Convenient quarters are provided for this department in the Dairy building. The equipment is such as to permit handling milk and cream on a commercial scale, thus giving the student practice under actual factory conditions. On the first floor, are the offices and manufacturing rooms, the latter including a boiler room equipped with a 15 H. P. internal furnace boiler and a 10 H. P. Jewel automatic steam engine; a farm butter-making room, in which are found hand churns, butter workers, and the various types of separators found on the market; a churn room, which is equipped with modern ripeners, combined churns, various forms of butter-molding appliances, refrigerating machine, cooling room, and ice-cream freezer; a cheese room, which is equipped with cheese vats, automatic pressure cheese press, and other equipment used in the cheese factory; and a cheese curing room.

On the second floor, are located recitation rooms, and advanced and general laboratories. The latter will accommodate one hundred twenty students in sections of forty each, and are equipped with a full line of appliances for testing milk and milk products. In the advanced laboratory, will be found moisture tests, salt tests, curd tests, and various other forms of apparatus suited to the needs of the advanced student. A circulating hot water system connects the wash sinks in all of the laboratories. Both steam and electricity are used for power purposes.

The College dairy herd consists of seventy-nine head of choice dairy cattle of the Guernsey, Jersey, Holstein-Friesian, and Ayrshire breeds. These cattle are housed in a modern dairy barn.

DEGREE COURSES IN DAIRY HUSBANDRY

(a) Dairy Production

	Semester	
	1st	2nd
Junior Year		
Forage Crops (Farm Crops 9).....	2	
Animal Nutrition (A. H. 7).....	2	
Genetics (Zool. 120).....	3	
Comparative Anatomy (Vet. Med. 1).....	3	
Animal Chemistry (Chem. 509).....	2	
Comparative Physiology (Vet. Med. 2).....		3
Herd Management and Milk Prod. (D. H. 2).....		5
Drill (Military 5, 6).....	1	1
Electives	3	6
Military Science (Theo. Inst. 1, 2).....	1	1
Seminar (D. H. 8).....	1	1
	—	—
	18	17

Senior Year

Dairy Bacteriology (Bact. 401).....	3	
Breeds and Breeding of Dairy Cattle (D. H. 5).....	3	
Diseases of Live Stock (Vet. Med. 3, 4).....	3	3
Buttermaking and Factory Management (D. H. 3).....		5
Seminar (D. H. 8, 9).....	1	1
Approved Electives	6	7
	—	—
	16	16

Dairy Manufacturing**Junior Year**

Forage Crops (Farm Crops 9).....	2	
Animal Nutrition (A. H. 7).....	2	
Business Organization and Mgt. (Com. 110).....	3	
Genetics (Zool. 120).....	3	
Dairy Chemistry (Chem. 502).....		3
Buttermaking and Factory Mgt. (D. H. 3).....		5
Milk Production and Herd Mgt. (D. H. 2).....		5
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Advanced Testing (D. H. 14).....	2	
Approved Elective	3	2
	—	—
	17	17

Senior Year

	Semester	
	1st	2nd
Cheesemaking (D. H. 4).....	4	
Dairy Bacteriology (Bact. 401).....	3	
Breeds and Breeding of Dairy Cattle (D. H. 5).....	3	
Ice Cream and Ices (D. H. 7).....		2
Dairy Mechanics (Ind. Arts 28).....		1
Dairy Mechanics (Farm Mech. 7).....		1
Seminar (D. H. 8, 21).....	1	1
Butter and Cheese Judging (D. H. 9).....		1
Market Milk (D. H. 12).....	3	
Electives	2	10
	16	16

The following courses are offered:

1. Elements of Dairying. The secretion and composition of milk, and the causes of variation in composition; brief discussion of dairy cattle, and the factors in milk production; the Babcock test applied to milk and other products; use of the lactometer; the various methods of creaming; the operation of cream separators; the care of milk and cream; making butter under farm conditions. The general principles of cheesemaking; marketing of milk; dairy by-products; statistics and economics of the dairy industry.

Laboratory. The use of the Babcock test applied to milk and dairy products, with special attention to conditions that may affect the accuracy of tests; use of the lactometer; churning and working butter; a study of the construction, operation, and efficiency of various makes of cream separators; practice in ascertaining the yield of milk and fat, and the cost of production of cows in the College herd.

Required in all courses in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$3.00. Deposit \$2.00.

2. Dairy Herd Management and Milk Production. Form and its relation to production; difference in the efficiency of dairy cows; improvement of dairy herds; methods of testing and record keeping; the use and importance of the pure-bred dairy sire in grading up the herd. **Care of the Dairy Herd:** care of the cow at time of parturition; the dairy calf and its successful development; developing the dairy heifer; care of the bull; feeding for economical

milk production and for records. Registered dairy cattle and their management, fitting for the show ring, advertising cattle, and **Dairy Farm Economics:** the preservation and saving of manure; labor; crop systems for the dairy farm, soiling, pasturing, feeds; silage crops and the making of silage; the organization and purpose of cow-testing, bull, and community breeders' association.

Milk Production: the production of market and certified milk; sources of infection and contamination of milk; the effect of different kinds of feed on flavor and healthfulness of milk; pasteurization of milk; contracts between milk companies and drivers.

Laboratory. Judging dairy cattle; scoring animals by breed and general score cards and judging classes of animals. Animals of the College herd will be used; and trips to local dairies, and an annual trip to prominent dairy farms in the Willamette Valley will be taken by College classes.

Prerequisite: Animal Husbandry 7. Required in courses in Dairy Production and Dairy Manufacturing; junior year; second semester; 3 or 5 credits; 3 recitations; 2 laboratory periods. Fee \$0.25. Text: Eckles, Dairy Cattle and Milk Production.

3. Buttermaking and Factory Management. The composition of milk and cream; the effects of condition of milk and cream on the quality and yield of butter; pasteurization; starters; ripening and churning cream; packing and marketing butter. The location, organization, and construction of creameries; creamery refrigeration and management; creamery accounting; and other studies designed to fit the student to manage and operate creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; the use of starters; churning, with special attention to factors that control the composition of butter; packing and wrapping butter; the use of acidity, moisture, and salt tests.

Prerequisites: Dairy Husbandry 1, Bacteriology 101. Required in courses in Dairy Production; senior year; second semester; in course in Dairy Manufacturing; junior year; second semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$2.00. Deposit \$1.00.

4. Cheesemaking. The importance of quality and composition of milk in the manufacture of cheddar cheese; composition and characteristics of common American and European cheeses; fer-

ments and fermentations and their control; factory management and construction; the making of cheddar cheese and some forms of soft cheeses.

Laboratory. Practice work in receiving and sampling milk; the use of the various tests for acidity, ferments, fats, solids, and casein; the making and curing of cheddar and other varieties of cheeses; the computation of yields, cost of manufacture, and profit; the effect of different methods of manufacture on yield and quality.

Prerequisites: Dairy Husbandry 1, Chemistry 502. Required in course in Dairy Manufacturing; senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$2.00. Deposit \$1.00. Text: Van Slyke and Publow, Principles and Practice of Cheesemaking.

5. Breeds and Breeding of Dairy Cattle. A study of the application of the principles of genetics to the breeding of dairy cattle; the breeding of the principal families of the various dairy breeds.

Laboratory. Practice in the use of the breed herd books in tracing and making pedigrees. A study of methods of registering animals and advanced registry systems.

Required in courses in Dairy Production and in Dairy Manufacturing; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50.

6. Dairy Farm Equipment and Inspection. The arrangement and construction of modern dairy buildings with regard to convenience and sanitation; the various types of dairy barns, silos, milk houses, manure pits, liquid manure cisterns, and septic tanks; the essentials in construction and installation of dairy equipment, such as stall ties, milking machines, separators, coolers, sterilizers, and various utensils.

Laboratory. Practice in score-card inspection of dairy barns and milk rooms. Drawing of plans for dairy barns, silos, manure pits, milk houses, and covered sheds. The actual operation of certain dairy appliances.

Prerequisite: Elementary Bacteriology 101. Required of Dairy Production seniors; elective for Dairy Manufactures seniors; first semester; 2 credits; 1 lecture; 1 laboratory or practicum period. Fee \$1.00.

7. Ice Cream and Ices. A study of the preparation, packing, and marketing of ice creams, sherbets, and related frozen products.

Laboratory. Practice in selecting and aging of cream for ice cream; standardizing and preparing the mix for the various frozen products; the freezing, packing, bricking, molding, coloring, and sale of the various frozen products; judging ice cream and related frozen products by the score card.

Required in course in Dairy Manufacturing; senior year; second semester; 2 credits; 1 recitation; 1 three-hours laboratory period.

8. **Seminar.** The study and review of new experiment station bulletins, and general dairy periodicals and literature. Papers are presented by the student on dairy subjects. Practice is given in outlining investigational work.

Required of all seniors and advanced students and elective to juniors majoring in Dairy Production and Dairy Manufacturing; first semester; 1 credit.

21. **Seminar.** Continuation of course 8. second semester; 1 credit.

9. **Butter and Cheese Judging.** Judging of butter and cheese with score cards; discussion of defects of body and flavor.

Required in course in Dairy Manufacturing; senior year; second semester; 1 credit; 1 three-hours laboratory period. Fee \$1.00.

10. **Advanced Judging.** Practice in judging dairy animals. This work, which includes trips to fairs and breeders' farms, is especially for those who desire to try for the Dairy Judging Team.

Elective; first semester; 1 credit; 1 two-hours laboratory period. Fee \$0.25.

12. **Market Milk.** City milk inspection; federal, state, and city regulations; classes of milk; chemistry and bacteriology of milk from the practical standpoint; the farm market milk retailer; the village milk plant; the city milk plant; the transportation of milk; pasteurization methods; study of methods followed, apparatus used, and division of labor in large milk plants. The laboratory work includes special tests of milk, scoring of milk exhibits and milk plants, and drawing of plans and equipment for buildings.

Prerequisite: Elements of Dairy (D. H. I). Optional in courses in Dairy Production, and required in Dairy Manufacturing; junior and senior years; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$2.00. Deposit \$1.00.

14. **Advanced Testing.** Application of the Babcock test; use of the lactometer in detecting adulteration; practical tests for the detection of preservatives, drug adulterations, and artificial colors;

fat determinations of cheese, butter, evaporated milk, sweetened condensed milk, and ice cream; moisture tests of butter and cheese; salt, color, and casein tests of butter.

Prerequisites: Elements of Dairy (D. H. I), and General Chemistry (Chem. 100 and 101). Required in courses in Dairy Manufactures; optional in Dairy Production; senior year; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$3.00. Deposit \$2.00. Text: Van Slyke, Modern Methods of Testing Milk.

30. Research and Thesis Work. This work is offered for senior and graduate students majoring in Dairy Husbandry. Investigational problems are assigned that will give the student training and experience in experimental work.

Elective for seniors and graduate students; first semester; credits to be arranged. Fee \$2.00.

Research and Thesis Work. Effective for seniors and graduate students; second semester; credits to be arranged.

Vocational Course in Dairy Manufactures	Semester	
	1st	2nd
Elementary Business English (Eng. M).....	3	
Dairy Accounting (Com. D).....		3
Dairy Bacteriology (Bact. A).....		3
Dairy Mechanics (Farm Mech. 7).....	3	
Dairy Mechanics (Ind. Arts 228).....		2
Breeding, Feeding, and Management of Dairy Cattle (D. H. J).....	3	
Testing Dairy Products (D. H. A).....	2	
Special Creamery Test (D. H. P).....		2
Buttermaking and Factory Management (D. H. B).....	4	
Cheesemaking (D. H. C).....		5
Ice Cream Making (D. H. D).....	2	
Creamery Practice (D. H. E, F).....	2	3
Judging Butter and Cheese (D. H. H).....		1
Drill (Military A, B).....	1	1
Gymnasium (Phys. Ed. 11, 12).....	1½	1½
	<hr/> 20½	<hr/> 20½

A. Testing Dairy Products. The testing of dairy products by the Babcock test, with special emphasis on conditions affecting the results of the test under practical conditions.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 1 lecture and laboratory period. Fee \$2.00. Deposit \$1.00.

B. Buttermaking and Factory Management. The principles of creamery buttermaking; construction, management, and care of the creamery; a comparison of the various methods commonly used in the manufacture of butter in creameries.

Laboratory. Practice in sampling and grading cream; pasteurization and ripening of cream; churning and packing butter.

Required in one-year course in Dairy Manufacturing; first semester; 4 credits; 2 lectures; 2 laboratory periods. Fee \$2.00. Deposit \$1.00.

C. Cheesemaking. The commercial manufacture of cheddar cheese, covering the process in detail; a study of other varieties of cheese; factory management and construction.

Laboratory. Practice in making cheddar and other varieties of cheeses. Records are kept of the different operations to note their effect on the finished product.

Required in one-year course in Dairy Manufacturing; second semester; 5 credits; 2 lectures; 1 four-hours laboratory period. Fee \$2.00. Deposit \$1.00.

D. Ice Cream Making. The preparation of mixes for various frozen products by different formulas; the freezing, packing, and sale of frozen products.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; 1 three-hours laboratory period; 1 lecture. Fee \$2.00. Deposit \$1.00.

E. Creamery Practice. Work in the creamery, care of creamery machinery, repairing and cleaning apparatus, to familiarize the student with practical creamery work.

Required in one-year course in Dairy Manufacturing; first semester; 2 credits; laboratory periods to be arranged.

F. Creamery Practice. Continuation of E; second semester; 3 credits; laboratory periods to be arranged. Fee \$2.00. Deposit \$1.00.

H. Butter and Cheese Judging. Judging butter and cheese with score card; discussion of the defects of body and flavor.

Required in one-year course in Dairy Manufacturing; second semester; 1 credit; 1 two-hours laboratory period. Fee \$1.00.

J. Breeding, Feeding, and Management of Dairy Cattle. The history and development of the dairy breeds; a study of the breeding of the principal families of the various breeds; the selection and use of the pure-bred dairy sire in grading up the herd; the practice of inbreeding, linebreeding, and crossbreeding in improving dairy cattle. Feeding dairy cattle for economical milk production; feeding for records; developing the dairy calf; developing the dairy heifer; care of the dairy herd; care of the cow at time of parturition; methods of testing and record keeping; care and handling of the bull; the organization and purpose of cow testing, bull and community breeders' associations; the construction of dairy barns, milk houses, manure sheds, and silos; practical problems.

Required of Vocational students in General Agriculture. First semester; 3 credits; 3 lectures.

P. Special Creamery Tests. Advanced work in the use of the Babcock test. Short cuts and conveniences for rapid and efficient testing; rapid tests for adulterants and preservatives; curd, acidity, and sediment tests.

Required in one-year course in Dairy Manufacturing; second semester; 2 credits; 1 lecture and 1 two-hours laboratory period. Fee \$2.00. Deposit \$1.00.

SHORT COURSE IN DAIRY MANUFACTURES

Beginning in January each year the College offers a short course in Dairy Manufactures. This course will begin immediately after Farmers' Week in January, 1919, and will continue six weeks. This course is planned to be of help to the experienced butter and cheese makers who wish to improve their work by acquiring the latest methods. It also is of great help to the factory helpers of the butter and cheese makers who wish to train themselves for better positions. A special announcement of this course to be published later, will give full information.

ENTOMOLOGY

LESTER LOVETT, Professor
FRANK HEIDTMAN LATHROP, Assistant Entomologist
*WILLARD JOSEPH CHAMBERLIN, Instructor
Teaching Fellow

The courses in Entomology are planned to give the student sufficient knowledge of the subject to understand the proper relation of Entomology to the different phases of Agriculture; to meet the needs of the student specializing in Entomology; and to serve the needs of students from other departments in which certain special courses are required. Students who wish to elect Entomology as a major may, if they desire, specialize in one or more branches by choosing their research problems in definitely grouped subjects. These groups include General Entomology, Agricultural Entomology, Civic Entomology, Entomology for Horticultural Inspectors, and Forest Entomology.

The courses in General and Economic Entomology are intended to provide the student with sufficient training to enable him to identify the common insect pests, understand their habits and life-history, and to apply the most approved methods for their control.

Forest Entomology includes the practical investigation of certain areas of timber to determine the kind and extent of insect infestation, methods of making out correct reports on forest insect infestation, and an investigation of the principles underlying control methods.

Advanced students in Entomology are provided with excellent opportunities for special instruction and research work. The library facilities are unusually good; the insect fauna of the western part of the State is distinctive, offering many new and interesting features for investigation.

Scheduled courses in this department will not be given to a class of less than five students.

Equipment. This department now occupies three rooms on the third floor of Agricultural Hall — one office, one laboratory, and one class room. The entomological class room is equipped for twenty-four advanced students. It also contains the entomological collections and extension materials. The research laboratory is fully equipped with up-to-date apparatus for carrying on research problems. The entomological library is exceedingly rich in old

* On leave of absence.

volumes and complete sets of entomological periodicals. Through the kindness of the librarian of the U. S. Department of Agriculture, students in this department have access to entomological publications contained in the library of the Department of Agriculture and the library of Congress.

COURSES IN ENTOMOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
* Electives	13	13
	—	—
	16	16

The following courses are offered:

301. Introductory Entomology. An introduction to the study of insects by lectures, laboratory, and field exercises. Sufficient field work in collecting, and laboratory work in properly mounting and classifying insects, is provided to make the student familiar with the principal orders of insects.

Prerequisites: Zoology 101, 102. Required in the courses in Horticulture, Plant Pathology, and Entomology; elective in other courses; junior year; first semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period. Fee \$1.00. Text: Sanderson and Jackson, *Elementary Entomology*.

302. Entomology of Orchard and Small Fruits. An intensive study of the more important insect enemies of the apple, pear, prune, cherry, plum, currant, gooseberry, bramble fruits, and strawberry, and the critical examination of the methods to be employed

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

in combating them. Each important pest will be studied in the field and laboratory, with a view to becoming thoroughly familiar with the appearance of the insect and its work in all its stages of development. In this and succeeding courses in Entomology the rearing of economic and other forms of insects, is carried on parallel with other work, to gain familiarity with the development and habits of insects. Each student is required to familiarize himself with the life-history, habits, and methods of controlling some insect of economic importance.

Prerequisite: Entomology 301. Required in the courses in Pomology, Plant Pathology, and Entomology; elective in other courses; junior year; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period. Fee \$1.00. Text: Sanderson, Insect Pests of Farm, Garden, and Orchard.

303. Entomology of Truck and Field Crops. A course similar to 302, with special emphasis put on the intensive study of the insect enemies of celery, onion, beet, cabbage, kale, clover, vetch, potato, hop, corn, wheat, and oats.

Prerequisite: Entomology 301. Required in the course in Vegetable Gardening; junior or senior year; elective for students in other courses; second semester; 2 credits; 1 recitation; 1 lecture; 1 laboratory period. Fee \$1.00. Text: Sanderson, Insect Pests of Farm, Garden, and Orchard.

304. Forest Entomology. A study of insect injuries to forest trees and forest products, factors influencing their occurrence and the general principles of control work.

The course in Forestry; junior year; second semester; 3 credits. Fee \$1.00. (Course not offered 1918-19.)

305. Forest Entomology. A continuation of course 304.

The course in Forestry; senior year; first semester; 2 credits; hours to be arranged.

Prerequisite: Entomology 304. Fee \$1.00. (Course not offered 1918-19.)

306. Advanced Entomology. This course is designed for those who desire to specialize in Entomology. The instruction includes lectures and reference reading on the biology of the principal families of insects, supplemented by laboratory studies of typical life-histories. Considerable time is devoted to studying the habits of insects, particularly injurious species in the field; to collecting, rearing, mounting, and classifying them; and to becoming familiar with Entomological methods and literature.

Required in the course in Entomology; elective in the courses in Agriculture; junior year; first semester; three credits; one lecture in Agriculture; junior year; first semester; 3 credits; 1 lecture; 2 laboratory periods. Fee \$1.00. Text: Folsom, Entomology with Reference to its Biological and Economic Aspects. (Course not offered 1918-19.)

307. Advanced Entomology. A continuation of course 306.

Required in Entomology; elective in the courses in Agriculture; junior year; second semester; 3 credits; 1 lecture; 2 laboratory periods. Fee \$1.00. (Course not offered 1918-19.)

308. Advanced Entomology. A continuation of courses 306 and 307.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; first semester; 5 credits; 2 lectures; 3 laboratory periods. Fee \$1.00. (Course not offered 1918-19.)

309. Advanced Entomology. A continuation of courses 306, 307, and 308.

Required in the course in Entomology; elective in the courses in Agriculture; senior year; second semester; 5 credits; 2 lectures; 3 laboratory periods. In connection with courses 306, 307, 308, and 309, the student will be required to present a thesis detailing the results of a systematic study of some restricted group of insects, or of the biology of some particular species or group of species. Fee \$1.00. (Course not offered 1918-19.)

310. Household Entomology. A study of insects in their relation to pharmacy and to the household. The history and development of insects in medicine, insects in relation to disease, and insect pests of dwellings and stores. Control methods will be taken up in detail. This course is intended to prepare students in Pharmacy and Home Economics intelligently to understand the bearing of insects upon the household and community, and the principles underlying methods of control.

Primarily for Pharmacy students; open to students in Home Economics and to others by special permission; no prerequisite. Two credits; 2 lecture periods. Fee \$1.00.

311. Beekeeping. A course in the theory and practice of keeping bees for profit and in relation to fertilization of orchard trees. The College has an apiary in which students will be able to become fully acquainted with modern apicultural methods.

Elective in courses in Agriculture and Home Economics; second semester; 1 credit; 1 laboratory period. Fee \$1.00. Text: Phillips, Beekeeping.

312. Problems in Forest Entomology. This course will include the study and application of methods of forest insect investigations. Each student will be assigned a practical problem in Forest Entomology to work out under direction.

Credits to be arranged. Fee \$1.00. (Course not offered in 1918-19.)

313. Problems in Forest Entomology. A continuation of course 312.

Prerequisite: Entomology 312. Credits to be arranged. Fee \$1.00. (Course not offered 1918-19.)

314. Seminar. Senior and graduate students in Entomology. Reading, discussing, and abstracting the leading articles on Entomology as they appear in the scientific journals, horticultural press, current magazines, and experiment station literature.

Senior year; first semester; 1 credit.

315. Seminar. A continuation of course 310.

Senior year; second semester; 1 credit.

316. Insect Taxonomy. An intensive study of the systematic grouping of insects; insect ecology as allied to taxonomy.

Prerequisite: Entomology 301. Elective in advanced entomology and of graduate rank; second semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$2.00.

317. Advanced Thesis and Research Methods. A course offered only for graduate students. Students will select problems in applied entomology on the life-history and control of some insect or group of insects; problems in ecology; monographic problems, etc., with special emphasis on methods of research.

Elective for graduate students only; first semester; from 8 to 16 credits.

318. Advanced Thesis and Research Methods. Continuation of course 317.

Elective for graduate students only; second semester; from 8 to 16 credits.

FARM CROPS

GEORGE ROBERT HYSLOP, Professor
HARRY AUGUST SCHOTH, Scientific Assistant, U. S. Dept.
of Agriculture, Forage Investigations
BERNARD FRANCIS SHEEHAN, Instructor.
GRACE COLE, Seed Analyst, U. S. Dept. of Agriculture

This department deals with the various problems of production, improvement, marketing, manufacture, and uses of each of the field crops produced for food, forage, textile, and special purposes.

The purpose of the work is primarily to teach students scientific, practical, and economical methods of crop production and improvement that may be put into actual use on the farm. In addition, the courses are so arranged that men may fit themselves for civil service positions, in agronomy, forage crops, grain standardization, plant breeding, crop marketing, etc., or for experiment station, extension, or teaching work. The object is to turn out men with a broad training on general lines and well finished in Farm Crops.

Considerable flexibility in electives is allowed in order to meet special needs of individual students.

Food shortage and problems of production and distribution have made especially heavy demands for well-trained Farm Crops specialists. The field is a large one and deals principally with well-known and staple crops that are constantly in use and in demand. The work is closely associated with the daily food supply of man and beast, and is of importance to all students of agriculture, whether seeking a salaried position or expecting to engage in the operation or management of a farm.

Equipment. The department has excellent recitation and well-lighted laboratory rooms. The laboratory is equipped with modern desks and tables for crop study. Gas, water, and electricity are available for general use. Special equipment consists of compound and binocular microscopes, dissecting and hand lenses, for study of crop structure and crop products; analytical and torsion balances for accurate weights; seed sampler; standard and Semper's type germinators for seed studies; and large collections of cereal, grass, and miscellaneous straw and seed specimens for class use. Grain testers, a Brown-Duvel moisture tester, a Boerner sampler, standard weight per bushel testers, grain pans, car triers, grain dockage testers, drying ovens, gluten test equipment and collections of standard grain grades, and corn-ear samples, provide excellent facilities for grain standardization and judging work.

The Experiment Station plots offer excellent opportunities for field study and make possible extensive collection of valuable material for class work. In addition to the above, a large collection of the best books, periodicals, etc., dealing with the subject, is available.

The Oregon Agricultural College is probably the best equipped institution on the Coast for grain grading and inspection work. Numerous graduates of regular and special courses have already engaged in federal and state work.

COURSE IN FARM CROPS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Junior Year	Semester	
		1st	2nd
Agricultural Economics (Com. 219).....		3	
Plant Chemistry (Chem. 510) or.....			2
Plant Physiology (Bot. 50).....			3
Agricultural Bacteriology (Bact. 501).....		3	
Principles of Plant Pathology (Bot. 101).....		2	
Diseases of Field Crops (Bot. 105).....		1	
Introductory Entomology (Ento. 301).....		2	
Cereal Crops (Farm Crops 57).....		4	
Land Drainage (Soils 103).....			3
Crop Improvement (Farm Crops 15).....			3
Soil Physics (Soils 5).....			3
Drill (Military 5, 6).....		1	1
Military Science (Theo. Inst. 1, 2).....		1	1
Elective			3 or 4
		17	17

Senior Year	Semester	
	1st	2nd
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Agrostology (Farm Crops 11).....		3
Forage Crops (Farm Crops 9).....	2	
Soil Fertility (Soils 7).....	3	
Farm Management (Farm Mgt. 1).....		3
Advanced Crop Breeding (Farm Crops 17).....	2	
Crop Efficiency (Farm Crops 22).....		3
Feeds and Feeding (A. H. 23).....		3
Potato Growing (Farm Crops 13).....	1	
Elective	5	1
	16	16

The following courses are offered:

1. Crop Production. Lectures and recitations on description, adaptability, seed-bed preparation; selection, storage, treatment, testing, and planting of seed; cultural methods; habits of growth; harvest, preservation, storage, marketing, rotation, production costs, and uses of the leading cereal, forage, and special field crops. The eradication of weeds. Laboratory work consists of studies of purity and germination of seed, methods of testing, seed cleaning, and seed treatment, corn and seed judging. Practical work consists of studying crop problems in the field on the College farm.

A general course outlining foundation principles of production and disposal of crops.

Agriculture; freshman year; either semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.75.

5. Cereal Crops. A study of the production, standardization, and marketing of cereal and allied grains from seed to consumer. Especial attention is given to varieties, their distribution and adaptability, methods and conditions for production, quality as affected by environment, markets, manufacture, and uses of wheat, oats, corn, rye, and less important cereals, and their enemies and control. Laboratory work consists of studies of varieties, their identification before and after threshing, cereal judging, grain standardization, moisture and gluten and hardness testing, conditions affecting germination, weight per bushel, etc. Suited to cereal

specialists, grain growers, and those desiring civil service work in agronomy, grain investigations, grain supervision and inspection work and for operators of country elevators and warehouses.

Agriculture; junior year; first semester; 2 or 4 credits; 2 recitations; 2 laboratory periods. Fee \$0.75. Texts: Carleton, *Small Grains*. Montgomery, *The Corn Crops*.

9. Forage Crops. A study of legumes, grasses, and succulent crops adapted to the work of students in agriculture. Temporary pasturing systems, seeding, care, and maintenance of permanent pasture; reseeding and care of range. Adaptability, culture, methods of handling, and value of various crops for forage. Silage and hay making. Soiling crop rotations. Costs, storage and marketing.

Agriculture; junior or senior year; first semester; 2 credits; 2 recitations. Fee \$0.75. Text: Piper, *Forage Crops*.

11. Agrostology. A study of the grasses, legumes, and other forage and seed crops. Methods of seeding, production, harvesting, and marketing of meadow, pasture, cover, and special crops for seed, fiber, and special purposes other than forage. The comparative structure and identification of the different forage plants, their adaptability to different conditions of soil and climate. Examinations of commercial seed for viability and purity. The identification of weed seed. The production of forage-crop seed. This course with *Forage Crops*, *Farm Crops 9*, fits persons for forage and seed specialization.

Agriculture; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.75. Texts: Piper, *Forage Plants*. Hitchcock, *A Textbook of Grasses*.

13. Potato Growing. A detailed study of potato soils, fertilization, culture, harvest, improvement, storage, costs, markets, distribution, uses, and manufacture. Varietal studies and identification. Potato judging and scoring.

Agriculture; senior year; first semester; 1 credit; 1 recitation. Fee \$0.75.

15. Crop Improvement. Studies of practical means of improving farm crops in quality and yield; field selection; mechanical and score-card methods of seed selection; variety testing; head and ear-to-row methods; multiplication; and pure-seed production. Hybridization and plant-breeding laws applicable to practical crop

improvement. Laboratory and field work consists of studies of transmission of characters, field selection, planning and planting of plots, hybridization methods, etc.

Agriculture; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.75.

17. Advanced Crop Breeding. An advanced course dealing with field-crop breeding from a more technical view point. Hybridization, variability, and its measurement. Transmission of characters. Behavior of characters of specific crops. A course designed for students desiring to enter plant-breeding work.

Agriculture; senior year; first semester; 2 credits; 2 recitations.

19. Seed Testing. A course for students preparing themselves for private, state, or government seed-testing work. Studies are made of seed identification and germination, seed legislation, and standard methods of seed testing.

Prerequisite or companion course: Agrostology (Farm Crops 11), Agriculture, Domestic Science, or Commerce; senior year; first or second semester; 2 credits; 2 laboratory periods. Fee \$0.75.

21. Weed Eradication. This course deals with weed types and habits of growth, weed laws, and the various practical methods of prevention, control, and eradication. Special attention is paid to noxious, persistent, perennial, and poisonous weeds of ranch and range.

Agriculture; junior or senior year; first semester; 1 credit; 1 recitation.

22. Crop Efficiency. The efficient production, handling, storage, and marketing of farm crops. A course dealing with a comparison of methods leading to cheaper and more efficient production: Analysis of net results; crop adaptability and its relation to substitutes and competing markets. Relation of preparatory methods to returns: sequence of crops as it affects yield, quality, and profits of succeeding crops. Organization and operation of cropping systems and crop rotations. Flexible cropping systems, crop specialization, extremes and fads, amendments as they affect yield, quality, and profits for specific crops. Systems of crop storage, handling, and use on farm and for market. Grade and standard fixation, making the most of grades and market customs. Factors determining when to sell. State, national, and international regulations dealing with transportation, inspection, and marketing of

farm crops. Export and import regulations. Preparation of crops for shipment, loading cars, weather data, and protection of shipments, crop statistics, their value and use. Disposal of crop by-products and other problems affecting successful crop production.

Required of Farm Crops seniors. Elective agricultural seniors; second semester; 3 credits; 3 recitations. Fee \$0.75.

23. Advanced Crop Work. Lectures or laboratory work or both will be offered to groups of students desiring additional work in various lines of crop production. Suggested topics are sugar beets, hops, flax, seed testing, grain standardization, grain grading, experimental methods, etc. Individual students desiring special work will be assigned to some practical problem involving experimental or research work and the preparation of a thesis.

Agriculture; senior year; either semester; 1 to 5 credits. Fee to be arranged.

24. Advanced Crop Work. Continuation of course 23 for students who wish to elect two semesters of this advanced work.

Agriculture; senior or graduate year; either semester; 1 to 5 credits. Fee to be arranged.

Graduate Work. Candidates for advanced degrees majoring in Farm Crops will be assigned some specific problem of a practical nature requiring careful original work. Result of laboratory and field work, together with a review of the literature of the subject, must be embodied in a suitable thesis.

Agriculture; graduate year; either semester or both; credits and fees to be arranged.

B. General Farm Crops I. Principles of crop production, breeding, and improvement; crop adaptability; crop rotations for economical production; seed care, selection, and testing; seed-bed preparation; seed treatment, seeding, culture; harvest methods for seed crops, beans, and cereals. Grain and seed handling, storage, grading, marketing; first semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.75.

C. General Farm Crops II. Forage, cover, and special crops; pasture and soiling systems; rotation, seeding, culture, care, harvest, and storage of forage crops, roots and potatoes; hay making, stacking, baling, marketing; silage making; root and potato storage and potato grading; culture and use of cover crops; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.75.

FARM MANAGEMENT

HENRY DESBOROUGH SCUDDER, Professor
REUBEN GUNN, Assistant Professor (Ext.)
CLAIR WILKES, Assistant

Fellow

No matter how expert the student may become in the various lines of agricultural production, his success as a farmer is not assured unless the organization and management of his farm as a whole, as a profitable business enterprise, is capably done.

The course in Farm Management is designed especially: first, to give the student a broad, well-rounded training in all the phases of agriculture that will prepare him for successful production, but with emphasis laid upon those studies which will fit him best for successful management of the farm; second, to prepare students for positions as managers of private, state, or federal farms; as county agriculturists; agricultural extension specialists; federal farm appraisers; specialists in marketing; or for investigational work in state college, experiment station, and federal service.

Equipment. The department has a specially equipped farm management laboratory and seminar room, provided with drafting tables and instruments, surveying instruments, original data and record sheets, lantern slides and charts, and a complete periodical and bulletin reference library. Investigational work carried on in many different parts of the state offers the advanced student excellent opportunities for field work.

COURSE IN FARM MANAGEMENT

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80. For students desiring to major in Farm Management the following course is recommended for the junior and senior years. Since different students have different needs, the course outlined below is not rigidly required except for the Farm Management, Soils, Farm Crops, Animal Husbandry, and Economics courses named. Those preferring to minor more strongly in some one subject may do so through arrangement with the department.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Forage Crops (Farm Crops 9).....	2	
Cereal Crops, Lectures (Farm Crops 7).....	2	
Typewriting (Com. 210-a).....	1	
Practical Pomology (Hort. 102).....	2	
General Farm Mechanics (Farm Mech. 1).....	2	
Irrigation Farming (Soils 105).....	3	
Farm Management (Farm Mgt. 1).....		3
Farm Management Seminar (Farm Mgt. 8).....		1
Soil Physics (Soils 5).....		3
Farm Power Machinery (Farm Mech. 3) or Land Drain- age (Soils 103).....		3
Diseases of Live Stock (Vet. Med. 14).....		3
Technical English (Eng. 141).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Farm Management Field Course (Farm Mgt. 5) 5 cred- its summer.	—	—
	17	17
Senior Year		
Soil Fertility (Soils 9).....	3	
Introductory Entomology (Ento. 301).....	2	
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Field Crops (Bot. 105).....	1	
Economic Organization of Agriculture (Com. 264).....	3	
Advanced Farm Management (Farm Mgt. 7).....	2	3
Farm Management Seminar (Farm Mgt. 9).....		1
Soil Surveying (Soils 13).....		2
Dairy Herd Management (D. H. 2).....		3
Feeds and Feeding (A. H. 23).....		3
Extempore Speaking (Eng. 104).....		2
Approved Electives	3	2
	16	16

1. **Farm Management.** Farm Management deals with the organization and management of the farm as a business enterprise. It concerns itself especially with those factors which affect the labor income. The chief subjects covered in this course are: types of farming, selection and purchase of the farm, requirements as to

capital investment and distribution, size and diversity of business, farm rental and leasing methods, management of man and horse labor, farm-equipment costs and duty, cropping systems on different types, maintenance of soil-fertility as a farm-management problem, farm-equipment costs and duty, cropping systems for different systems of farming, farm and farmstead layout and building arrangements, production costs, marketing in relation to farm management, the study of successful and unsuccessful farms. Whenever possible, short field trips are taken. Students desiring to strengthen their work in this course or wishing to work out a home farm-management problem, may do so by taking laboratory work to accompany it, registering in Advanced Farm Management (Farm Management 7), for this purpose.

Elective; junior or senior year; second semester; 3 credits; 3 lectures. Fee \$1.00.

3. Semi-Arid Farm Management. A study of the farm-management problems of the dry farmer and irrigation farmer, and the preparation of management plans dealing with fertility, rotations, equipment, labor distribution, forms of production, marketing, etc., as adapted to semi-arid conditions. When circumstances permit, a field excursion into the dry farming and irrigated sections of Oregon for farm survey work, will be made.

Prerequisite: Farm Management 1. Elective; senior year; first semester; 1 credit; 1 lecture. Fee \$0.50.

5. Farm Management Field Course. A course for students specializing in Farm Management. The object of the course is two-fold: first, to increase the student's knowledge of the practical application of the principles of Farm Management, through direct study and analysis, in the field, of some of the most successful farms in the State; second, to give the student training in regular farm-management survey work.

In the summer of the junior year, following the close of the College in June, the group of students registered in this course, accompanied by the instructor, spends four or five weeks in the field in various representative sections of the State, devoting about one week to each section. All of the time during the day is spent in the company of the farm owner in the study of his individual farm and its methods, a complete record being taken, and in the evenings this record is analyzed.

In order to reduce expense and increase the efficiency of the work, camp equipment is provided and field camp maintained throughout the period, the student paying only his living and traveling expenses.

Prerequisite: Farm Management 1. Elective; junior year; 5 credits; field work.

7. Advanced Farm Management. In this course students in Agriculture who have taken or are taking the lecture work in Farm Management 1 are offered opportunity to do laboratory or field work, applying the principles of the subject in working out problems in which they are especially interested, such as those connected with the home farm or home region or a future farm under certain known conditions. Working out detailed re-organization plans for farms in different parts of the State, is a feature of the course.

Students specializing in Farm Management will register in this course for laboratory and field work as indicated above but on a more extensive scale and with wider range, including advanced reading in the literature of the subject.

Elective; junior year, second semester; or senior year, either semester; 1 to 5 credits. Fee \$0.50.

8. Seminar. A course for all junior, senior, and graduate students majoring in Farm Management. Discussion of investigational methods, analysis of data, new literature, special problems, etc., with programs of outside speakers, successful farmers and the like. The class is organized and conducted by the students as their technical association in Farm Management.

Required of all majors in Farm Management; junior year; second semester; 1 credit; fortnightly meetings.

9. Seminar. Same as Farm Management 8.

Required of all majors in Farm Management; senior or graduate year; second semester; 1 credit; fortnightly meetings.

11. Accredited Farm Work. The object of this course is to offer opportunity for the furtherance of the student's training in Farm Management through a period of actual experience obtained on a highly developed farm where the practical application of the principles of good management are in successful operation. Advanced or graduate students who have taken the regular four-years course in Farm Management or its equivalent and who have previous good records of practical experience in farming and the necessary personal qualifications as to character, industry, etc.,

may register in this course. Such students will be assisted to secure places as workmen on "accredited" farms — farms operated by progressive and successful farmers — known to the College as following the best practices in production and management. In addition to gaining actual experience, the student will be required to study the organization, management, methods, costs of production, methods of solution of special problems, etc., on this farm, and make written report upon the same and where advisable, prepare re-organization plans. He will be visited and his work inspected by the instructor and reported upon by the farm owner. The College credit given the student for a year on such a farm will depend upon the quality of his practical work and the extent and quality of his study of organization and management as evidenced in his written reports.

Senior or graduate year; 8 to 16 credits. Fee \$1.00.

13. Graduate Work. Under this head all graduate work in Farm Management is registered. Graduate work in this field divides itself into the two phases indicated below. Selection should be made according to the work the student desires to prepare himself for.

a. Research. For the student who wishes to prepare himself for investigational and instructional or extension work in Farm Management. With the development of Farm Management throughout the country as a distinct science or branch of agriculture, opportunities are opening up for men in either instructional or investigational or extension work in both state and federal service. Problems of wide diversity are available for thesis subjects, ranging from the reorganization and preparation of management plans for unsuccessful farms to the study of efficiency factors in special regions, such as on dry-land or irrigated areas, on marsh or diked lands, on drainage reclamation areas, on distinct soil types, etc. Field studies in cost of production; farm management surveys in selected areas or on special types of farming, etc. The minor courses required in connection with research problems are taken in residence one or both semesters and the major work in residence or in the field.

b. Practical Management. For the student who wishes to prepare himself more thoroughly as a farm manager, one year registered in the course Accredited Farm Work (Farm Management 11) combined with one semester's work in residence graduate work, is suggested.

Elective; graduate year; either semester; credits to be arranged.

14. Graduate Work. Continuation of course 13 through the second semester's work.

Elective; graduate year; either semester; credits to be arranged.

A. Practical Farm Management. The chief factors bearing on successful farming, such as the type of farming, size of business, use of capital, handling of labor, proper equipment, cropping systems, marketing, etc., are given consideration from the practical standpoint. The laboratory work deals with the solution of the home-farm problems.

Vocational course; first semester; 2 credits; 2 recitations; 1-hour laboratory period. Fee \$0.50.

B. Farm Planning and Organization. The practical application of the principles learned in the preceding course, to the planning or re-planning of the student's home farm or an assigned farm. These organization plans include not only the selection of the most profitable industries and the laying out of the farm and farmstead to give maximum efficiency in operation, but also provide in detail the development programs of the farm as to improvements, equipment, live-stock production, cropping plan, fertility, labor and financial programs, etc.

Vocational course; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

FARM MECHANICS

WILLIAM JAMES GILMORE, Professor
Instructor

The purpose and scope of the work in Farm Mechanics is indicated fully in the description of courses given below.

Equipment. The Farm Mechanics building is complete for Farm Mechanics work. It is an attractive, well-lighted, brick building, having a large operating floor, a class room, locker room, shop and tool rooms on the first floor. The operating room is used for displaying the heavier farm machines and for indoor operation of tractors and automobiles. A gallery surrounds this operating floor and provides space for the lighter farm machines, such as tillage, haying, and harvesting machines, and manure spreaders, many of which are operated from a line shaft.

A very large equipment of the most up-to-date farm machinery is loaned the institution by the leading implement dealers of the Northwest, so that the student has constantly before him and is working with and studying the very best farm machines of all types. Plows, harrows, pulverizers, rollers, cultivators, corn planters, potato planters and diggers, grain and grass seeders, mowers, rakes, hay loaders, corn and grain binders, sprayers and manure spreaders, ensilage cutters, hay balers, and threshing machines, are representative machines found in the laboratory. The large, well-lighted gas-engine laboratory contains many different makes of gas engines and accessories, such as sectional carburetors, magnetos, and lubricators. In addition to this equipment is the large selection of grain-cleaning and crushing machines, farm-lighting plants, pumps, rams, and water-supply equipment.

The laboratory is also equipped with two large brakes for the testing of tractors; dynamometers for determining the draft of the field machines and the draw-bar horse power of tractors, and also a gas and steam indicator for determining the efficiency of farm engines and tractors; and an electric motor and watt meter, so that the student may become familiar with the power requirements of belt-driven farm machines.

COURSES IN FARM MECHANICS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Junior Year	Semester	
		1st	2nd
Agricultural Economics (Com. 219).....		3	
Drill (Military 5, 6).....		1	1
Military Science (Theo. Inst. 1, 2).....		1	1
* Electives		12	15
		—	—
	Senior Year	17	17
National Government (Com. 320).....		3	
State and Municipal Government (Com. 322).....			3
*Electives		13	13
		—	—
		16	16

The following courses are offered:

1. **General Farm Mechanics.** Concrete construction on the farm, farm water supply, detailed and comparative study of field machines, assembling and adjusting field machines, crushing and cleaning machinery, threshing machinery, heating farm homes, power requirements of belt-driven machines, field tests showing draft and effects of mis-adjustments in field machines, farm fences, selection and care and adjustments of farm machines, demonstrations of tractor for field operations, farm gas and electric lighting.

Optional; sophomore year; either semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.50. Deposit \$1.00. Text: Equipment for Farm and Farmstead.

3. **Farm Power Machinery.** Principle, construction, operation, adjustment, and repair of farm power machines. Study of carburetors, ignition, governing, and cooling systems, lubricants, and lubrication. Testing, adjusting, and trouble hunting. Detail study and power requirements of belt-driven machines, such as crushers, ensilage cutters, etc. Pumping machinery and hydraulic ram. Pipe fitting, babbitting, soldering, belt lacing, and valve grinding.

Either semester; 1 or 3 credits; 1 recitation; 2 laboratory periods.

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

Fee \$2.00. Deposit \$1.00. Text: The Gasoline Automobile.

5. Farm Motors and Tractors. Detail study and operation of the gas, steam, and electric motor, including the stationary gas and steam engine, tractors, trucks, and automobile. Valve setting on steam engines; flue repair. Electricity in its adaptation to farm uses. Indicated, brake, and drawbar horse-power tests of tractors.

Prerequisite: Farm Mechanics 3. Either semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$2.00. Deposit \$1.00.

7. Dairy Mechanics. Concrete floors and sidewalks, concrete bases for machines, detailed study of gas engine operation; trouble hunting and tests of gas engine; gas engine accessories; study of pumps, steam boilers, and steam engines; firing and operating steam engines; lubricators; injectors; magnetos; flue repair.

Elective; junior or senior year; either semester; 3 credits; 1 lecture; 2 laboratory periods. Fee \$1.00. Deposit \$1.00.

9. Orchard Machinery. Given to Horticultural students from the mechanical standpoint, and includes study of construction, operation, and efficiency of orchard machinery, such as gas engines, pumps, tillage, and seeding implements. Orchard plowing and cultivation. Demonstration of tractor for orchard work. This course is intended only for students who cannot take the regular courses in Farm Mechanics.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods. Fee \$1.50. Deposit \$1.00.

13. Advanced Farm Mechanics. For students who have inclinations toward mechanics and who feel that more work is needed than was obtained in courses 1, 3, and 5. This course includes efficiency tests of gas and steam tractors (indicated, brake, and drawbar), plowing with tractors, power requirement tests of belt-driven machines with electric motor and watt meter, automobile study and operation, magnetos, self-starters, farm lighting, concrete construction, binder adjustments, dynamometer tests of various field machines.

Prerequisites: Farm Mechanics 1, 3, and 5. Elective; senior or graduate year; either semester; 1 or 2 credits. Fee \$2.00. Deposit \$1.00.

14. Advanced Farm Mechanics. Continuation of course 13 for students who wish to take the second semester of this advanced work.

Elective; senior or graduate year; either semester; 1 or 2 credits.

15. Concrete Construction and Farm Machines. A special course designed to meet the requirements of the Industrial Arts students who expect to teach Farm Mechanics, Farm and Ornamental Concrete Construction; detail study, operation, trouble hunting, and testing, gas engines; gas and steam engine accessories; exercises with the common farm machines and such exercises as babbitting, belt lacing, and rope tying and splicing will be given.

Elective; junior or senior year, Industrial Arts; one semester; three credits. Fee \$2.00.

A. Farm Machines and Engines. A general course in Farm Mechanics. The more important field machines and gasoline engines are studied. Farm buildings, concrete work, rope work, etc., are also given attention.

Vocational course; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.50. Deposit \$1.00.

HORTICULTURE

CLAUDE ISAAC LEWIS, Professor
VICTOR RAY GARDNER, Professor of Pomology
EZRA JACOB KRAUS, Professor of Research
ARTHUR LEE PECK, Professor of Landscape Gardening
ARTHUR GEORGE BOUQUET, Professor of Olericulture
WALTER SHELDON BROWN, Assistant Professor (Ext.)
LESTER LINGLE, Assistant Professor of Horticultural Products
FRANK EARL DENNY, Research Assistant
ALDEN FORREST BARSS, Instructor
* HARRY DUANE LOCKLIN, Instructor
LEWIS TAYLOR BUCHMAN, Teaching Fellow
OLIVER HAMM, Gardener

The scope of the work in Horticulture is very broad, giving instruction in Pomology, Olericulture, Floriculture, Landscape Gardening, School Gardening. In these courses the student is first thoroughly grounded in the fundamentals, and is then allowed to specialize as he may desire. He may thus fit himself for station or government work, or prepare for the many lines in horticultural business, such as fruit growing, truck gardening, floriculture, or landscape gardening.

The required work for students electing horticulture covers a wide range, giving the student a thorough training, not only in plant propagation and the general principles of orchard management and vegetable growing, but in floriculture and landscape gardening as well, thus broadening his views and interesting him in the aesthetic and all that pertains to more beautiful surroundings.

The courses consist of lectures, reference reading, field exercises, and laboratory work. Much stress is placed upon the practical phases of all the work. In all courses horticultural truths are illustrated by practice, whenever possible. Students are given field and laboratory exercises in all such operations as planting, seeding, budding, grafting, cultivating, thinning, pruning, harvesting, and spraying.

The Horticultural Building contains modern laboratories for spraying, plant propagation, fruit packing, systematic pomology, and vegetable preparation. There are special class rooms, large draughting rooms, museum, and greenhouses. The department is also establishing young orchards and vegetable gardens, and has at its disposal a large campus upon which are planted many species of trees and shrubs. The student is materially assisted in all of his

* On leave of absence.

work, and the research work especially, by the excellent horticultural library.

Equipment. The Horticultural wing of the Agricultural building contains many spacious rooms, and thoroughly modern equipment for teaching the various subjects. In the basement will be found a large spray laboratory furnished with gas and water and all the equipment, chemicals, and apparatus which are necessary to teach students the proper mixing and testing of the different sprays; accommodations are offered also for the testing of nozzles and spraying apparatus. The department has a large number of hand and power spraying outfits that are placed at the disposal of students.

A large, well-lighted plant-propagation laboratory offers unexcelled opportunities for the study of plant propagation. Specially equipped cabinets, tables, and incubators have been constructed; so that the students can study to advantage such topics as seedage, layerage, making of cuttings, and budding and grafting.

A laboratory has been especially fitted for the use of students in gardening. It contains large cement-set tubs, where students are taught the proper methods of preparing vegetables for market. This room also contains a demonstration earth bed for use during the winter, to show how the various tools for planting seed and for cultivation are used. The demonstration bed also allows the instructor to demonstrate the proper method of interplanting and transplanting of plants.

In the basement is also located a very large fruit-packing laboratory, equipped with box presses, grading machinery, and packing tables. The large storage rooms are also located in the basement and include a suite of rooms which are chilled by mechanical refrigeration.

On the first floor a systematic pomology laboratory is especially equipped for the study of nuts, fruits, etc. A special research laboratory, located on this floor, is used for research assistants in the department, and is also at the disposal of advanced students. This room is completely equipped with ovens, microscopes, and other apparatus necessary for extensive research work.

On the top floor, in the horticultural museum, are exhibited all sorts of equipment used in Horticulture, such as pruning shears, budding and grafting utensils, prune-drying apparatus, fruit graders, etc. On this floor a large draughting room extends along the entire south end of the building, fully supplied with tables,

cabinets, etc., for the use of students studying Floriculture, Landscape Gardening, Greenhouse Construction, Orchard Planting, and Packing House Construction. In addition to these rooms, the department has four large lecture rooms. A balopticon with a good collection of lantern slides, and a large library, add materially to the equipment.

The department is also well provided with tools and apparatus necessary for conducting field exercises in Truck Gardening, Floriculture, Landscape Gardening, and Pomology.

COURSES IN HORTICULTURE

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

(a) Pomology		Semester	
Junior Year		1st	2nd
Agricultural Economics (Com. 219).....	3		
Floriculture (Hort. 401).....	2		
Landscape Gardening (Hort. 301).....			2
Plant Propagation (Hort. 105).....			2
Practical Pomology (Hort. 102).....	2		
Orchard Practice (Hort. 103, 104).....	2		2
Plant Physiology (Bot. 50).....			3
Drill (Military 5, 6).....	1		1
Military Science (Theo. Inst. 1, 2).....	1		1
Approved Electives	6		6
		—	—
Senior Year		17	17
National Government (Com. 320).....	3		
State and Municipal Government (Com. 322).....			3
Systematic Pomology (Hort. 115).....	4		
Commercial Pomology (Hort. 117).....			3
Introductory Entomology (Ento. 301).....	2		
Entomology of Orchard and Small Fruits (Ento. 302).....			2
History and Literature of Horticulture (Hort. 125).....			2
Seminar (Hort. 123, 124).....	1		1
Principles of Plant Pathology (Bot. 101).....	2		
Diseases of Orchards and Small Fruits (Bot. 102).....			2
Approved Electives	5		4
		—	—
		17	17

(b) Olericulture

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Plant Propagation (Hort. 105).....		2
Practical Vegetable Gardening (Hort. 203, 204).....	3	3
Floriculture (Hort. 401).....	2	
Landscape Gardening (Hort. 301).....		2
Introductory Entomology (Ento. 301).....	2	
Entomology of Truck and Field Crops (Ento. 303).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	5	5
	—	—
	17	17

Senior Year

National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Commercial Truck Gardening (Hort. 209, 210).....	3	3
Forcing Vegetables (Hort. 205, 206).....	2	2
Systematic Olericulture (Hort. 207).....	1	
Seminar (Hort. 123, 124).....	1	1
Principles of Plant Pathology (Bot. 101).....	2	
Diseases of Vegetable Crops (Bot. 104).....		2
Approved Electives	4	5
	—	—
	16	16

(c) Floriculture

Junior Year		
Agricultural Economics (Com. 219).....	3	
Floriculture (Hort. 401).....	2	
Landscape Gardening (Hort. 301).....		2
Plant Materials (Hort. 305, 306).....	3	3
Greenhouse Construction (Hort. 403).....		3
Introductory Entomology (Ento. 301).....	2	
Entomology of Truck and Field Crops (Ento. 303).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	4	4
	—	—
	17	17

HORTICULTURE

141

	Semester	
	1st	2nd
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Forcing Flowers (Hort. 405, 406).....	3	3
Agricultural Bacteriology (Bact. 501).....	3	
Forcing Vegetables (Hort. 205, 206).....	2	2
Advanced Plant Breeding (Hort. 127, 128).....	3	3
Diseases of Vegetable Crops (Bot. 104).....		2
Approved Electives	2	3
	<hr/>	<hr/>
(d) Landscape Gardening	16	16
Freshman Year		
Modern English Prose (Eng. 81, 82).....	3	3
Plane Surveying (C. E. 222).....		5
Modern Language (French, German, or Spanish, first Yr.)	3	3
Agricultural Botany (Bot. 41, 42).....	3	3
Trigonometry (Math. 11).....	3	
Architectural Drawing (Arch. 601).....	3	
Drill (Military 1, 2).....	1	1
Library Practice (Libr. 1).....		$\frac{1}{2}$
Hygiene (Phys. Ed. 10).....		$\frac{1}{2}$
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Approved Elective	1	1
	<hr/>	<hr/>
Sophomore Year	17 $\frac{1}{2}$	17 $\frac{1}{2}$
American Literature (Eng. 71, 72).....	3	3
Modern Language (French, German, or Spanish, second Yr.)	3	3
Topographic Surveying (C. E. 223).....	5	
Railroad and Canal Surveying (C. E. 272).....		5
Principles of Fruit Growing (Hort. 101-a).....	2	
Fundamentals of Land. Gard. (Hort. 101-b).....	1 $\frac{1}{2}$	
Landscape Gardening (Hort. 301).....		2
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Approved Electives	3	4
	<hr/>	<hr/>
	18 $\frac{1}{2}$	18 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Composition of Addresses (Eng. 103, 104).....	2	2
Water Color Rendering (Arch. 505, 506).....	2	2
Floriculture (Hort. 401).....	2	
Plant Materials (Hort. 305, 306).....	3	3
Hist. and Lit. of Landscape Architecture (Hort. 311).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives	3	6
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Theory and Design (Hort. 307, 308).....	2	3
Town Planning (Hort. 313).....	3	
Field Practice (Hort. 309, 310).....	3	3
Approved Electives	5	7
	—	—
	16	16

It is suggested that four of the elective credits in sophomore year be taken in Architectural drawing and Perspective, such as Arch. 602, Arch. 518.

The following courses are offered:

101-a. Principles of Fruit Growing. This includes the problems incident to the establishing of an orchard. It embraces a consideration of such questions as locations, site, soils, windbreaks, variety selection, selection of nursery stock, and planting. Some attention is also given to problems incident to maintenance, especially the maintenance of the home orchard. It is designed especially for general agricultural students, who are interested mainly in the orchard as an accessory of the general farm. At the same time, it is a fundamental course for students desiring to pursue other horticultural studies.

Required of all Agricultural students; sophomore year; 2 credits; 3 recitations; 1 laboratory period. Fee \$1.50. Text: Sears, Productive Orchardng.

101-b. Fundamentals of Landscape Gardening. This course consists of a series of lectures and practicums dealing with the beautifying of the farm home and rural public buildings. It begins

after the Christmas holidays and extends to the end of the second week in March. Registration for the course should be arranged in September.

Required of all Agricultural students; sophomore year; $1\frac{1}{2}$ credits; for the remainder of the first semester, 3 recitations and 1 laboratory period; for the first part of the second semester, 1 lecture and 1 laboratory period. Text: Sears, *Productive Orchard-ing*.

Pomology

102. Practical Pomology. A continuation of course 101-a. It deals especially with the problems incident to the maintenance of the commercial orchard, including a study of such questions as cover crops, fertilization, irrigation, frost occurrence and prevention, pollination, pruning, thinning, spraying, and spray injury.

Required of students majoring in Pomology; junior year; first semester 2 credits; 3 recitations. Text: Bailey, *The Pruning Book*.

103. Orchard Practice. A laboratory course in which the student obtains actual practice in regular orchard and packing-house operations. The work includes tree planting, pruning, the preparation of spray solutions, a study of spray machinery, orchard spraying, orchard heating, and the picking, grading, packing, and judging of fruits.

This course is open only to those who have taken or are taking course 102.

Required of juniors majoring in Pomology; junior year; first semester; $1\frac{1}{2}$ credits; 1 laboratory period of four hours scheduled for Saturday forenoons. Fee \$1.00.

104. Orchard Practice. A continuation of course 103.

Required of juniors majoring in Pomology; junior year; second semester; $1\frac{1}{2}$ credits; 1 laboratory period of four hours scheduled for Saturday forenoons. Fee \$1.00.

105. Plant Propagation. A study of the propagation of plants by means of seeds, separation, division, layerage, cuttage, and graftage. Sufficient attention is given the subject of nursery management to acquaint the student with its more important features.

Required of juniors majoring in Pomology; junior year; second semester; 2 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

109. Viticulture. A study of the problems pertaining to the growing, harvesting, and marketing of both the American and European types of grapes. Soils, locations, pruning, training,

harvesting, grading, packing, storage, etc., are some of the questions receiving attention.

Elective; open to juniors and seniors; second semester; alternate years; (not given in 1918); 2 credits; 2 recitations.

111. Small Fruit Culture. A study is made of the problems connected with the growing, harvesting, and marketing of such fruits as the strawberry, currant, gooseberry, raspberry, blackberry, Loganberry, and cranberry.

Elective; open to juniors and seniors; second semester; 2 credits; 2 recitations.

113. Nut Culture. A study of the methods of growing, harvesting, curing, and marketing of such nut crops as the walnut, filbert, almond, and pecan. In the laboratory a detailed study is made of the leading varieties of these different nuts.

Elective; open to juniors and seniors; second semester; alternate years (to be given in 1918); 2 credits; 1 recitation; 1 laboratory period.

115. Systematic Pomology. A study of the principles underlying pomological nomenclature and variety description, classification, and adaptation. A critical study is made of many varieties of fruits, of the influence of environment upon behavior of fruit trees and the development of their products. The student becomes acquainted with the more important fruit groups and their interrelationships.

Required of seniors majoring in Pomology; senior year; first semester; 4 credits; 2 recitations; 3 laboratory periods. Fee \$3.00.

117. Commercial Pomology. The problems of handling fruit, including the picking and grading and packing of fruits; a study of the problems of transportation, storage, distribution, and marketing. Considerable attention will also be given to the planning of buildings for the packing and storing of fruit.

Required of seniors electing Pomology as a major; senior year; second semester; 3 credits; 3 recitations.

119. Sub-Tropical Pomology. This course takes up in detail the problems concerned with the growing and marketing of such sub-tropical fruits as oranges, figs, olives, pineapples, etc.

Elective; senior year; first semester; 2 credits; 2 recitations.

121. Advanced Pomology. A finishing course in pomology. The students will first be given a general review to determine their knowledge of pomology. The course is designed especially to fit students for Civil Service examinations. The latter part of the

course will be devoted to the study of some advanced problems in pomology, and will also include a study of orchard costs and economics, the cost of production, and marketing.

Elective; senior year; second semester; 3 credits; 3 recitations.

123. Seminar. A course especially arranged for senior and graduate students in Horticulture. A study is made of some of the advanced problems. Articles from the leading magazines on horticultural subjects, as well as station and Government publications, are reviewed.

Elective for Agricultural seniors; required for advanced students having their major in Horticulture; senior year; first semester; 1 credit; 1 two-hours recitation.

124. Seminar. Continuation of course 123.

Prerequisite: Course 123; elective for seniors electing Horticulture as a major; senior year; second semester; 1 credit; 1 two-hours recitation.

125. History and Literature of Horticulture. A study is made of the literature and history of Horticulture from the time of the Egyptians to modern times.

Required of seniors electing Pomology as a major; senior year; second semester; 2 credits; 2 recitations.

126. Advanced Orchard Practice. This course will deal with problems of pruning, spraying, budding, and grafting. It will consist entirely of field work or laboratory exercises. Work will be conducted not only at Corvallis, but in various other sections of the State. The course is especially offered for those students who have had regular orchard-practice work, and who have the qualifications to enable them to secure benefit from the course.

Students can only be registered by appointment with the head of the department. Schedule by arrangement in four-hour periods on Saturdays. Work will commence January 1, and extend to May 1.

2 credits; 1 laboratory period.

127. Plant Breeding. The principles of breeding. A study of some of the facts pertaining to variation, classification of variations, causes of variation, and the theories that have been advanced to explain the inheritance of characters. The class-room work will consist of lectures, reference readings, and recitations; the laboratory work will acquaint the student with statistical methods of studying variation; and through greenhouse experiments

he will become acquainted with some of the ways in which environment influences plant growth.

Elective; open to seniors and graduate students (and to juniors by special permission); first semester; 3 credits; 3 recitations; 1 laboratory period. Fee \$1.00. Text: Davenport, Principles of Breeding.

128. Plant Breeding. A continuation of course 127. A study of breeding systems and recent breeding work. For the laboratory work, each student will be assigned to some problem that will give him a knowledge of the technique involved in plant breeding studies, and of the methods that are employed in plant breeding investigations.

Elective; open to seniors and graduate students (or to juniors by special permission); second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Davenport, Principles of Breeding.

Vegetable Gardening

Students taking their major in this course are required to take Horticulture 301 and 401.

201. Vegetable Growing. This course is offered for the purpose of teaching the student the value of a well-conducted farm or home vegetable garden, serving especially those students who cannot further pursue a horticultural course. At the same time, the work will be fundamental in the instruction of higher courses in commercial vegetable growing and marketing, for those students who desire to pursue work in this branch of Horticulture.

Required; sophomore year; second semester; 1½ credits; 1 lecture; 1 laboratory period. Work begins the third week in March. Registration should be arranged at opening of second semester. Fee \$0.50. Text: Lloyd, Productive Vegetable Gardening.

203. Practical Vegetable Gardening. This course is offered to those students wishing to learn the fundamentals of the business of vegetable gardening. The practices of the leading commercial growers in all phases of field management will be studied, including such problems as vegetable soils, locations, production of plants, distribution of crops, successions, rotations, manures and fertilizers, irrigation, implements, capital, labor, and other vital factors in the management of a commercial vegetable farm.

Required of juniors electing Vegetable Gardening as a major; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period.

204. Practical Vegetable Gardening. A continuation of the above course, designed especially for those who are specializing in vegetable growing. Course 204 offers work dealing with the methods used in the commercial production of vegetables for market, consisting largely of practicums in field and greenhouse so as thoroughly to acquaint the student with proper methods and management. The commercial testing grounds, trips to vegetable farms, and the College greenhouses give ample opportunities for the student to fit himself for later commercial work.

Required of juniors electing Vegetable Gardening as a major; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Text: Corbett, Garden Farming.

205. Forcing Vegetables. The problems connected with the forcing of such vegetables as lettuce, cucumbers, tomatoes, rhubarb, and melons, in cold frames, hotbeds, and greenhouses. Lectures and exercises in the greenhouses.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 2 credits; 1 lecture; 1 laboratory period.

206. Forcing Vegetables. Continuation of course 205.

Prerequisite: Horticulture 205. Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

207. Systematic Olericulture. Description, nomenclature, and classification of vegetables. Exercises are given in displaying and judging vegetables.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 1 credit; 1 laboratory period.

209. Commercial Truck Gardening. Only the purely commercial aspects of market gardening and trucking are offered in this course. Problems of growers in the production of vegetables on an extensive scale for market and cannery will be considered. Students will be fitted by this course for extensive or intensive operations, and for managerial positions. Particular attention will be paid to modern methods of marketing vegetables; and the economics of producing vegetable crops will be treated in lectures and discussions.

Required of seniors electing Vegetable Gardening as a major; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

210. Commercial Truck Gardening. A continuation of course 209.

Prerequisite: Horticulture 209. Required of seniors electing Vegetable Gardening as a major; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period.

Landscape Gardening

(For the first course in Landscape Gardening, see Pomology 101-b.)

301. Landscape Gardening. All students should be interested in everything that pertains to the decoration of the home, the improvement of school grounds, the beautifying of streets, and the establishment of recreation grounds and parks. In the course in Landscape Gardening the general principles of this are so treated as to apply to the up-building of the aesthetic in everyday life.

Required of Agricultural juniors electing Horticulture as a major; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period.

303. Tree Surgery. The principles of tree surgery are presented and put into execution in the laboratory. All the varying cuts, cavities, fillings, bracing, and cultivating will be worked out in a practical manner.

Elective; junior year; first semester; 1 credit; 1 laboratory period.

304. Tree Surgery. A continuation of course 303.

Elective; junior year; second semester; 1 credit; 1 laboratory period.

305. Plant Materials. To create satisfactory landscape effects, one must have a broad knowledge of the materials with which landscape architects must work. A thorough study is given to trees, both evergreen and deciduous, shrubs, vines, perennial herbaceous plants, biennials and annuals, with a view to bringing out their characteristics, such as foliage, color, form, adaptation, hardiness, and artistic effect.

Prerequisite: Horticulture 301. Elective; junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

306. Plant Materials. A continuation of course 305.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

307. Theory and Design. A study of the best works of prominent landscape architects, together with a wide range of collateral reading bearing upon the various problems. Private estates, public parks and play grounds, boulevards, and cemeteries will be

carefully studied. Reports, such as those of park boards and landscape architects, will also be studied.

Prerequisites: Horticulture 301, 305, 306. Elective; senior year; first semester; 2 credits; 2 laboratory periods.

308. Theory and Design. A continuation of course 307, in which a large portion of the time will be devoted to the preparation of planting plans. Outside time will be required for collateral reading.

Prerequisites: Horticulture 301, 305, 306, 307. Elective; senior year; second semester; 3 credits; 3 laboratory periods.

309. Field Practice. A course in practical problems brought in from the field of practice. The student is required to make the surveys, do the engineering work incidental to the solving of the problem, make general plans, planting plans, grading plans, details, and, in short, perform all the duties ordinarily met with in the landscape architect's office.

Prerequisites: Horticulture 301, 305, 306. Civil Engineering required in freshman and sophomore year. Elective; senior year; first semester; 3 credits; 3 laboratory periods.

310. Field Practice. A continuation of course 309.

Prerequisites: Horticulture 301, 305, 306, 309. Civil Engineering required in freshman and sophomore year. Elective; senior year; second semester; 3 credits; 3 laboratory periods.

311. History and Literature of Landscape Architecture. Designed to give the student a good idea of the development of the art, and to bring him into close touch with the literature, past and current, that is related to the subject.

Elective; senior year; second semester; 2 credits; 2 recitations.

313. Town Planning. This course is offered in order that the student may understand, in a general way, the underlying ideas of municipal, town, and village improvement. Literature and reports are studied, town problems discussed, and methods of procedure in town improvement worked out.

Elective; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

Floriculture

Students taking their major in Floriculture are required to take Horticulture 301 and 401.

401. Floriculture. An elementary course in the cultivation of greenhouse and home plants and of the common annuals and perennials used in outdoor work. The course is designed to broaden

the views of those students who are unable to take advanced courses in Floriculture, and to make them more useful citizens.

Required of Agricultural juniors electing Horticulture as a major; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$0.50.

403. Greenhouse Construction. A course particularly adapted for students specializing in Floriculture and Truck Gardening. The problems connected with the building of greenhouses, hotbeds, and cold frames are dealt with; also the selection of materials; the various systems of heating and ventilating, and the value of the various types of buildings. Lectures and laboratory exercises in greenhouse and draughting room are conducted.

Elective; junior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

405. Forcing Flowers. The propagation and problems of culture; such as soils, ventilation, and heat, connected with the forcing of plants used in the florist's trade.

Prerequisite: Horticulture 401. Elective; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

406. Forcing Flowers. A continuation of Horticulture 405. Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods.

501. Floriculture. As related to the cultivation of the common household and dooryard flowers, instruction is given in various subjects; namely, proper soils, planting of seed, transplanting, making of cuttings, cultivation, principles of heating and ventilating, and control of insect pests and diseases. In addition, such problems as the grouping and arranging of flowers, so as to obtain the best color harmonies and most pleasing effects while growing, as well as for decoration purposes, are included. The lectures are supplemented by reference reading and laboratory periods in the greenhouse and garden.

Course in Home Economics; junior year; first semester; 2 credits; 1 recitation; 1 laboratory period.

503. Landscape Gardening. The general principles of Landscape Gardening are taught, the aim being to give the student sufficient foundation to understand landscape gardening as applied to home decoration; to interest the student in the home beautiful; and the improvement of our public school grounds, and city and village streets. A study is made of photographs, and of famous landscape paintings, showing good taste and design in various

phases of Landscape Gardening. Lectures and reference readings are supplemented by field exercises.

Course in Home Economics; second semester; 2 credits; 1 recitation; 1 laboratory period.

505. Vegetable Gardening and Small Fruit Culture. Care of soil, seeding, rotation, fertilizing, and the selection of the best varieties of vegetables and small fruits for use in the home garden. Lectures, laboratory, and field exercises.

Course in Home Economics; second semester; 3 credits; 2 recitations; 1 laboratory period.

HORTICULTURAL PRODUCTS

Horticultural products work consists of four courses; namely, courses 601, 602, 603, and 604, each course to be a continuation of the preceding one. These courses will include training in canning, evaporation, vinegar manufacture, Loganberry juice manufacture, and the preparation of special products, such as butter, jams, jellies, glace', Maraschino, and crushed fruits. The work which will be conducted on a factory basis, will be handled according to the available products of each season. Instruction in canning will embrace grading, blanching, exhausting, capping, sterilization (both open and in retort), the manufacture of sirups and brines, labeling and storage. Both fruits and vegetables will be handled. In evaporation, instruction will be given with prunes, peaches, apricots, apples, pears, and vegetables, both kiln and tunnel driers being used. Special emphasis will be placed on grading the products, processing, packing, and general preparation for marketing. With juices, special work will be offered with Loganberry and grape juice, unfermented cider, and vinegars. With special products, instruction will be offered in the manufacture of butter, jellies, glace', Maraschino, and crushed fruit. Junior year; 3 credits; 1 lecture; 2 laboratory periods.

601. Horticultural Products. Junior year; first semester; 3 credits; 1 lecture; 3 laboratory periods.

602. Horticultural Products. Junior year; second semester; 3 credits; 1 lecture; 3 laboratory periods.

603. Horticultural Products. Senior year; first semester; 3 credits; 1 lecture; 3 laboratory periods.

604. Horticultural Products. Senior year; second semester; 3 credits; 1 lecture; 3 laboratory periods.

Research

The department of Horticulture is unusually well equipped for offering research work. In addition to the laboratory facilities, there are the greenhouses, experimental plots, and a splendid research library, well supplied with scientific books and periodicals, all combining to give the student unsurpassed facilities.

701. Research Work for Seniors. This course is offered for those seniors who are contemplating following college, experiment station, or Government work as a life career, or for those students who desire to have some special training in research technique. Problems will be assigned to the students which will give them experience in the laboratory, greenhouse, field, and library.

Elective; senior year; first semester; 3 credits.

702. Research Work for Seniors. A continuation of course 701.

Elective; senior year; second semester; 3 credits.

703. Advanced Thesis and Research Work. A course offered only for graduate students. Such students will be allowed to select problems in pomology, vegetable gardening, landscape gardening, floriculture, plant breeding, and the like.

Elective; for graduate students only; first semester; from 10 to 20 credits.

704. Advanced Thesis and Research Work. A continuation of course 703.

Elective; for graduate students only; second semester; from 10 to 20 credits.

705. Methods of Research. This course is offered to graduate or senior students interested in research work. It will be conducted as a research round table. Special drill will be given in the making of briefs and outlines of research problems, in methods of procedure in conducting investigative work, and in the preparation of bulletins and reports. The study of research problems conducted by the department of Horticulture will be taken up, and a close study made of the research work which is presented in bulletins from other institutions.

Elective; senior or graduate students; first semester; 1 credit.

706. Methods of Research. Continuation of course 705.

Elective; senior or graduate students; second semester; 1 or 2 credits.

The work in Pomology, designated as 101-a, is given the first semester, extending only to the Christmas holidays, for which 2 credits will be allowed.

The work in Landscape Gardening, designated as 101-b, begins after the Christmas holidays, and extends to the end of the second week in March, for which 1½ credits will be allowed. Registration for this course should be arranged with the first semester registration in September.

The work in Vegetable Gardening, designated as 201, begins with the third week in March and extends to the end of the second semester, for which 1½ credits will be allowed. Registration for this course should be arranged with the second semester's registration in February.

Any student completing a single third of the course will be allowed separate credits.

ONE-YEAR VOCATIONAL COURSE IN HORTICULTURE

	Semester	
	1st	2nd
General Farm Crops II (Farm Crops B).....		3
Farm Machines and Engines (Farm Mech. A).....	3	
Business English (Eng. N).....		3
Animal Husbandry (A. H. F).....		2
Practical Farm Drainage (Soils C).....		2
Farm Management (Farm Mgt. A).....	2	
Farm Soils (Soils A).....	3	
Breeding, Feeding, and Mgt. Dairy Cattle (D. H. J).....	3	
Gymnasium (Phys. Ed. 11, 12).....	½	½
Drill (Military A, B).....	1	1
Orchard Management I, II (Hort A, B).....	8	9
	<hr/> 20½	<hr/> 20½

A. Home Orchard and Garden. This course is provided for Vocational students in General Agriculture. It will deal primarily with the horticultural work of the home, the establishment and maintenance of the home orchard and home vegetable garden. It will also deal with some of the problems of beautifying of grounds.

Vocational course; second semester; 2 credits; 1 lecture; 1 laboratory period.

B. Productive Orcharding. This course is offered only for Vocational students majoring in Horticulture and takes the place in the schedule of Horticulture A, the Home Orchard and Garden. This is a lecture course, dealing with some of the main problems of orchard maintenance, such as pruning, spraying, harvesting, and packing of fruits, the building of storage houses, etc.

Vocational course; second semester; 3 credits; 1 lecture; 2 laboratory periods.

C. Orchard Management I. This is strictly a laboratory and field course dealing with the various phases of orcharding, such as harvesting, grading, and packing of fruits, spraying and pruning, and similar problems.

Vocational course; first semester; 8 credits; 3 full afternoons a week.

D. Orchard Management II. A continuation of Horticulture C. This course will deal with setting, staking, pruning, spraying, budding, grafting, and similar orchard problems.

Vocational course; second semester; 9 credits; 3 afternoons a week.

POULTRY HUSBANDRY

JAMES DRYDEN, Professor
CHARLES STOCKTON BREWSTER, Instructor

In recognition of the importance of the poultry industry, and to meet the demands of students who aim to give special attention to this industry after leaving college, the department of Poultry Husbandry was established. Poultry keeping is a part of every well-regulated system of diversified farming, and at the same time offers opportunity for profit-making as a special business under special conditions. The two poultry plants at the College offer opportunities for study of the practical as well as the theoretical side of the poultry industry.

Equipment. The equipment of this department consists of a number of poultry houses of different types; about 1,000 fowls of several breeds and varieties; twenty incubators of several different makes; brooders of different types; hatching, brooding, and colony coops; bone and clover cutters; fattening batteries; trap-nests; and various other appliances necessary for practical poultry keeping. A recent valuable addition is forty standard exhibition coops mounted on movable tables. These are used in judging poultry from the utility standpoint. There are also sets of charts, lantern slides, motion pictures and photographs, illustrating breeds of fowls, poultry farms, and houses.

COURSE IN POULTRY HUSBANDRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Poultry Husbandry (P. H. 1, 2).....	4	4
Embryology and Histology (Zool. 104, 105).....	3	3
Anatomy of the Fowl (Vet. Med. 12).....	2	
Poultry Diseases (Vet. Med. 12).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Ins. 1, 2).....	1	1
Approved Electives	3	6
	17	17

Senior Year	Semester	
	1st	2nd
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Poultry Husbandry (P. H. 3, 4).....	5	5
Genetics (Zool. 120).....	3	
Farm Management (Agron. 505).....		3
Approved Electives	6	4
	16	16

The following courses are offered:

1. Poultry Husbandry. Includes a study of breeds of domestic poultry, their history and classification; principles and methods of breeding for different purposes, emphasizing the laying and market qualities of the breeds; principles and methods of poultry-house construction. Laboratory work consists of practise in judging from fancy and utility standpoints; planning, estimating, and building poultry houses and appliances. Current poultry literature dealing with these subjects will be considered.

Required of all juniors in Poultry Husbandry; junior year; first semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

2. Poultry Husbandry. A continuation of course 1. Includes a study of the principles and practises involved in natural and artificial incubation and brooding; study of the egg and its development. Experimental work dealing with incubation problems will be carefully studied. Laboratory work consists of a detailed study of different makes of incubators and brooders and actual practise in running incubators and brooders. An opportunity will be given wherever possible for the student to work out some definite problem.

Prerequisite: Poultry Husbandry 1. Required of all juniors in Poultry Husbandry; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00.

3. Advanced Poultry Husbandry. A continuation of Poultry Husbandry 2. Includes a study of feeds suitable for poultry; the principles and practices of feeding for egg production and fattening; feeding young and growing chicks; feeding appliances. Laboratory work in feeding fowls for egg production and fattening under practical or experimental conditions; planning the work, and

compiling and writing up the data; the compounding of rations; study of feeds. Current poultry literature and experimental work on feeding will be studied.

Prerequisites: Poultry Husbandry 1, 2. Required of all seniors in Poultry Husbandry; senior year; first semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00.

4. Advanced Poultry Husbandry. A continuation of Poultry Husbandry 3. Includes a study of the general care and management of poultry and its products; marketing eggs and poultry; methods of grading, packing, shipping, and storing eggs and poultry. Study of farm records. As a final problem each student will work out complete plans for the layout and management of a commercial poultry enterprise. Laboratory work will consist in killing, picking, packing, and grading poultry and judging, grading, testing, and packing eggs.

Prerequisites: Poultry Husbandry 1, 2, 3. Required of all seniors in Poultry Husbandry; senior year; second semester; 5 credits; 3 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$1.00.

Note. Each student specializing in Poultry Husbandry will be required to plan and conduct some original investigational work and prepare a thesis covering it.

6. Practical Poultry Keeping. A course arranged to meet the demands of students who desire a knowledge of practical poultry keeping as it applies to general farm conditions, but who do not wish to specialize in the work. Includes a brief study of breeds and types of poultry; selection and breeding of farm poultry; poultry-house construction and equipment; hatching and rearing; feeds and feeding; marketing and management.

Required of sophomores in Agriculture; second semester; 2 credits; 2 lectures or recitations; 1 laboratory period. Fee \$1.00. Text: Lippincott, Poultry Production.

8. Poultry Breeding. Includes a study of the origin and history of the breeds and varieties of poultry; the principles of breeding as they apply to poultry with special reference to the inheritance of egg production; systems and methods of breeding as they affect production. Laboratory work will consist in judging fowls for egg production and utility qualities; practise in selecting and culling fowls.

Elective; first semester; 2 credits; 1 lecture or recitation; 1 laboratory period.

9. Marketing Poultry Products. This course is given primarily for students in Home Economics but is open to others who have had satisfactory preparation for the work. Includes a study of types of market poultry and eggs; improving the quality of poultry products by feeding, etc.; principles involved in buying poultry and eggs; a study of the changes that take place in poultry and eggs while being held; the use of, and comparative value of, different grades of eggs; methods of preserving eggs. Laboratory work will consist of judging, candling, grading, and packing eggs; judging dressed poultry; drawing, trussing, deboning, carving; comparative study of different grades of poultry flesh and eggs.

Elective; junior and senior years in Home Economics; first semester; 1 credit; 1 lecture; 1 laboratory period. Fee \$1.00.

*** Poultry Diseases.** (Vet. Med. 12) Elective; required of all seniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 2 laboratory periods; second semester.

***Anatomy of the Fowl.** (Vet. Med. 11.) Elective; required of all juniors in Poultry Husbandry; 2 credits; 1 lecture or recitation; 1 laboratory period; first semester.

A. Farm Poultry. Arranged to meet demands of students unable to take the degree course. Students will be given practice in judging poultry, feeding laying and fattening birds, caponizing, operating incubators, feeding and rearing chicks, etc., as well as assisting in general work about the department. Practical work supplemented with lectures and recitations in class room.

Vocational course in Agriculture; second semester; 2 credits. Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

B. A continuation of course A, but may be taken separately.

Second semester; 3 credits Fee \$1.00. Deposit \$1.00. Text: Dryden, Poultry Breeding and Management.

* These two courses are given as Vet. Med. 11 and 12.

SOILS

WILBUR LOUIS POWERS, Professor
CHARLES VLADIS RUZEK, Associate Professor
_____, Assistant Professor (Ext.)
_____, Instructor
JOHN ELIJAH PITMAN, Fellow

The soil is the foundation of all agriculture and no student in agriculture is well prepared for his work who is not fully versed in his knowledge of it. The work in soils includes a thorough treatment of the pure and applied branches of the subject, including two main groups of subjects; namely, (a) the soil moisture group and (b) soil fertility group. Soil physics, soil drainage, irrigation farming, and dry farming operations are primarily related to the former group, while soil fertility, the effect of crop rotations, and soil management ultimately deal more with the second group. Soil surveying contemplates both groups of subjects, all of which have their inter-relations.

Degree courses extending over four years are offered in (a) Soils and (b) Drainage and Irrigation.

The purpose of the courses in Soils is to give the student a thorough training in this important phase of agriculture, making him competent for his work on the farm or preparing him for positions in state or federal service.

Courses in Drainage and Irrigation hitherto have dealt with these subjects largely from the engineer's standpoint; and the disposal of water from soil or distribution of water within the farm unit has been considered of such small concern as to require nothing but a brief and more or less superficial treatment. Reclamation development has progressed so far, however, that haphazard and loose practices are no longer considered profitable. If the reclamation projects are to pay for costly development, great care must be given to the location of tile or the distribution of water on the farm. The adoption of scientific methods of handling soils and crops under irrigation and drainage projects, is coming to be regarded as of paramount importance. With the further extension of state and federal aid to reclamation, there will be a greater demand for men who have a knowledge of how most successfully and economically to use water which the engineer's canals and reservoirs provide. These men must know the best time, amount, and method of irrigation, and the effects of irrigation upon soils and crops. They should also know the relations between

soils, soil waters, and drainage, and understand how to locate and construct drains and treat the soil so as to secure the highest possible efficiency for each unit of tile employed.

In this course students combine practical and theoretical training received through lectures, laboratory exercises, and field experiments. The course offers opportunity for electing courses in general agriculture, economics, and other electives to give the student a broad training for modern dry farming, irrigation farming, irrigation investigations, or the work of a drainage contractor or drainage specialist.

Equipment. A large soil laboratory is equipped with the necessary apparatus for the complete study of the physical properties of soil and problems of soil management. Ample desk room, supplied with running water, gas, compressed air, and electricity, is available. Electric centrifuges and shakers, electric bridge for alkali testing, electric air baths, analytic and torsion balances, microscopes, blast lamps, aspirators, percolators, capillary tubes, mulch cylinders, soil sieves, scales, solution balance, compression filters, soil-sampling tubes, etc., form part of the equipment for the work in Soils. Soil surveying and mapping outfits, soil survey charts of the United States, and a collection of samples of the chief soil types of Oregon and the United States, are available.

A Soil Preparation room equipped with benches, soil-grinding and sifting machinery, and ample space for the drying, preparation, and storage of large quantities of the different soil types used in the laboratories, is available.

For the class of field work in Drainage and Irrigation, surveying instruments, tile, and ditching tools, weirs, flumes, hook gauges, water-stage register, electric pumping plant, etc., are available. Weather-recording instruments of different kinds supply equipment for the course in Climatology. Laboratories fitted with desks, ovens, etc., afford opportunity for studies of the movement and retention of irrigation water in soil, the effects of irrigation upon soils and crops, the effect of the tile drainage upon soils of different types, their rate of drainage, etc. The experimental plots and field work in this course offer exceptional opportunity to study drainage and irrigation under practical field conditions. On the College farm the students build weirs, measure water, lay out distribution systems, make cement pipe for laterals, and test pumping machinery. On the drainage plots, the rate of discharge is measured and the effect of drains and soil conditions on water

table is studied. Students are required to lay out, level, set grade stakes, and lay tile in some part of a drainage system on the College land.

An Exhibit Room has been provided and equipped with exhibit cases and racks for displays of the soil sample collections, sub-soils, hardpans, soil analyses, soil colors, soil drainage and irrigation exhibits, etc.

A well-stocked reference library is available. The Experiment Station farms at Corvallis and in other parts of the State, together with the cooperative trials in different counties, offer opportunity for field study of soil problems.

COURSES IN SOILS

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

(a) General Soils

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Forage Crops (Farm Crops 9).....	2	
Cereal Crop Lectures (Farm Crops 7).....	2	
Agricultural Bacteriology (Bact. 501, 502).....	3	3
Land Drainage (Soils 103).....		3
Soil Chemistry (Chem. 503).....	3	
Soil Physics (Soils 3).....		4
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives.....	2	5
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Agricultural Geology (Min. 171).....	3	
Soil Fertility (Soils 7).....	4	
Crop Improvement (Farm Crops 15).....		3
Farm Management (Farm Mgt. 1).....		3
Soil Surveying (Soils 13).....		2
Approved Electives.....	6	5
	16	16

(b) Drainage and Irrigation

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Irrigation Farming (Soils 105).....	3	
Climatology (Soils 107).....		2
Topographical Surveying (C. E. 243).....	2	
Agricultural Bacteriology (Bact. 501).....	3	
Principles of Plant Pathology (Bot. 101).....	2	
Introduct. Entomology (Ento. 301).....	2	
Land Drainage (Soils 103).....		3
Elements of Dairying (D. H. 1).....		3
Crop Improvement (Farm Crops 15).....		3
Farm Power Machinery (Farm Mech. 3).....		3
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
Approved Elective		1
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Hydraulics (I. E. 101).....	2	
Hydraulic Lab. (Exp. E. 265).....	1	
Irrigation Institutions (Soils 111).....	2	
Soil Fertility (Soils 7).....	4	
Advanced Irrigation (Soils 117).....	2	
Farm Management (Farm Mgt. 1).....		3
Irrigation Management (Soils 119).....		1
Feeds and Feeding (A. H. 23).....		3
Dairy Herd Management (D. H. 40).....		3
Extempore Speaking (Eng. 104).....		2
Approved Electives	2	
	16	15

The following courses are offered:

1. **Soils.** The origin, formation, and classification of soils; a study of the physical properties of soil moisture, heat, and air; the effects of tillage, drainage, and irrigation. The plant foods and soil fertility, fertilizers, crop rotations, and manures. Acid and alkali soils.

Prerequisites: Chemistry 100 and 101. Course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Lyon, Flippin and Buckman, Soils.

2. Soils. Continuation of the course outlined under "Soils 1."

Course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Lyon, Flippin and Buckman, Soils.

3. Soil Physics. Advanced study of the geology of soils, with their origin, formation, physical composition, and classification. Soil moisture and moisture movements and conservation. The various physical processes of the soil—surface, tension, osmosis, capillarity, diffusion, etc. The effects of the various crops and the different methods of culture upon the texture, aeration, temperature, and moisture of the soil, and the resulting alteration in crop-producing power. The influence of washing, drainage, and irrigation upon soils. Work in the laboratory will consist of the determination and comparison of such physical properties in the various soil types as, specific gravity, water retention, capillarity, organic content, etc.; the physical effect of mulches, rotations, and cropping; soil sampling and judging; the mechanical analysis of soils.

Elective; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Deposit \$2.00. Text: Mosier and Gustafson, Laboratory Manual.

5. Soil Physics, Elective. Similar to course No. 3, but shorter, dealing with the more important phases of the subject. Designed as an elective for agricultural students unable to take the regular course in Soil Physics, and for students in Irrigation Engineering.

Elective; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Mosier and Gustafson, Laboratory Manual.

7. Soil Fertility. Advanced work in the composition and values of fertilizers and barnyard and green manures, and the maintenance and improvement of fertility by the use of the same. The effect of the various crops and different systems of farming upon the fertility of the soil. Crop rotations and fertility in different sections of the State and the United States. The productivity and best use of the different types of Oregon soils, their

plant food requirements and comparative values, and methods of improvement of each. Field plot and pot culture investigations. Where necessary, the laboratory work may be omitted and the lecture work only taken (see Soils 9).

Elective; senior year; first semester; 4 credits; 3 recitations; 1 laboratory period. Fee \$1.00. Deposit \$2.00.

9. Soil Fertility Lectures. Same as Soils 7 except no laboratory work.

Elective; senior year; first semester; 3 credits; 3 recitations. Fee \$0.50.

11. Dry Farming. One of the special courses given in Dry Farming, another of which is described under Farm Management as Semi-Arid Farm Management. This course takes up the advanced study of the subject of moisture conservation, special tillage methods and machinery, soil and climatic conditions, etc., in dry-farming regions, with particular reference to Oregon and the Northwestern states. Given 1920 and alternate years thereafter.

Prerequisite: Soils 3 or 5. Elective; junior or senior year; second semester; 1 credit; 1 recitation.

13. Soil Surveying. For the advanced student who wishes to specialize in Soils for service in the state experiment stations or the Government Bureau of Soils. The course includes some advanced study of the classification of soils and soil areas of the United States, of Oregon, and of the Northwest, but most of the time is devoted to work in the field, making regular and completed soil surveys of assigned areas, with a report thereon.

Prerequisite: Soils 3 or 5. Elective; senior year; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

15. Advanced Soil Work. The advanced student specializing in Soils may study the various soil types of Oregon through mechanical analysis, and other physical tests; may undertake field work in soil surveying and mapping; or, through wire-basket, pot-culture, and field-plot tests, may determine the effects of various systems of cropping, or fertilizing, or of soil bacteria, upon soil fertility.

Prerequisites: Soils 3 and 7. Elective; senior or graduate year; either semester; 2 to 5 credits. Fee \$1.00. Deposit \$2.00.

16. Advanced Soil Work. Continuation of course 15.

Elective; senior or graduate year; either semester; 2 to 5 credits. Fee \$1.00. Deposit \$2.00.

101. Drainage and Irrigation. Principles of drainage and of irrigation; use of chain and level as applied to location and installation of tile drains or irrigation laterals. Design of tile systems; their effects upon soils and crops; costs and benefits.

Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$0.50. Deposit \$1.00.

103. Land Drainage. The history of drainage; road, field, and sanitary drainage on the farm; the different systems of drainage; methods of locating, installing, operating, and maintaining drainage conduits, cost, efficiency, and profits; drainage districts, their organization; laws governing. Lectures, notes, readings, and field work.

Elective; junior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00.

105. Irrigation Farming. Methods of obtaining, distributing, and conserving irrigation waters. Handling of different crops under irrigation. Cost and profits thereof, and duty of water in various districts of Oregon. Water rights and irrigation codes. Field and laboratory studies of irrigable qualities of different soils, laying out of irrigation systems.

Elective; junior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Widtsoe.

107. Climatology. Practical meteorology; observing and recording local weather and forecasting; a study of the climate of Oregon and the effect of climate upon agriculture. Class room and laboratory work. Given alternate years.

Elective; junior or senior year; second semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$0.50. Deposit \$1.00.

109. Advanced Land Drainage. A study of drainage problems and conditions in the field. The actual surveying, laying out, draughting of plans, estimation of cost, and installation of drainage systems at different points in the State, is required of students taking this course. A complete report of the organization of a drainage district is prepared by each class.

Prerequisite: Drainage and Irrigation 1. Elective; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods (week end). Fee \$0.50. Deposit \$1.00.

111. Irrigation Institutions. A brief history of the development of water laws. Water rights and irrigation codes in the different states, particularly in the Northwest and Oregon. Appro-

priation, adjudication, and administration of water. Reclamation and other government and state land acts affecting irrigation development. Organization and administration of irrigation districts and projects, water users' associations, etc. Discussion of public questions relating to irrigation.

Elective; senior year; first semester; 2 credits; 2 recitations.
Text: Chandler.

113. Irrigation Farming Elective. Special course for Irrigation Engineering students or other students who cannot take the regular course in Irrigation Farming the first semester. This course deals with the handling of irrigation water after it reaches the farm, and of the different crops under irrigation. The irrigable quality of different soils, the duty of water in various districts of Oregon, and water rights and irrigation codes from the standpoint of the farmer, are important features of the course.

Elective; junior or senior year; second semester; 2 credits; 2 recitations.

115. Irrigation Field Practice. This course is planned to add interest to irrigation farming and develop a practical knowledge of irrigation farming conditions. Careful records are to be kept of water used on different soils and crops and of the field obtained from definite areas. This work may be done during the summer months in connection with duties as ditch rider or other field agent. A report is required and work is to be outlined with the instructor in advance.

Prerequisite: Drainage and Irrigation 3. Following second or third college year's work; 1 to 3 credits.

117. Advanced Irrigation. Irrigation literature and methods of irrigation investigation. Field and laboratory studies of irrigation experiments and calculation of depth of water applied and of the most economical production thereby secured. Costs and profits connected with irrigation are determined. Analysis of data and preparation of a report is required in this course. Field examinations will be made, where possible, of some of the largest projects in the State.

Senior year; first semester; 3 credits. Fee \$0.50. Deposit \$1.00.

119. Irrigation Management. A study of the operation and maintenance of irrigation systems. Methods and records for water masters. Control of agencies destructive to ditches. Cost and dura-

bility of materials used in distribution of water on the farm. Water rotations for different types of farming.

Required of seniors and advanced students specializing in Drainage and Irrigation. Senior or graduate year; second semester; 1 credit. Given in 1919 and alternate years.

121. Advanced Drainage or Irrigation Work. Under this head the student who has completed the courses offered may take up further study of special problems in either subject, such as the drainage of alkali lands, drainage against seepage, study of water-table fluctuations, runoff, etc.; or field studies of the duty of water for a certain district, conservation of irrigation waters, effect of irrigation on soil moisture conditions, etc.

Elective; senior year; either semester; 2 to 5 credits. Fee \$0.50. Deposit \$1.00.

123. Advanced Drainage or Irrigation Work. Continuation of course 19 for students who wish to elect two semesters of the advanced work.

Elective; senior year; either semester; 2 to 5 credits. Fee \$0.50. Deposit \$1.00.

RESEARCH

The department of Soils is well equipped for offering research work, the experiment fields, soil tanks, laboratories and library, and plans and methods used in soil, irrigation, and drainage investigations are accessible to the graduate students.

501. Advanced Thesis and Research Work. A course for graduate students either as a major or minor. Students will be allowed to select problems in soil physics, analysis, surveying, fertility, irrigation, drainage, soil management, dry farming, or related subjects.

Elective; graduate students; first semester; 5 to 20 credits.

502. Advanced Thesis and Research Work. A continuation of course 501.

Elective; graduate students; second semester; from 5 to 20 credits.

A. Farm Soils. A brief history of the origin of soils; the fertility of soils; the most valuable chemical constituents; their exhaustion and replenishment; the most important physical factors; their deterioration or improvement. The physical components; their relative value and amounts in soil mixtures. Practice in

judging the chief soil types of Oregon. The effects upon soils of tillage, manuring, crop rotation, drainage, and irrigation.

Vocational course; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Deposit \$1.00. Text: Whitson and Walster, *The Soil*.

C. Practical Farm Drainage. The value of drainage, and the methods and cost of installing drainage systems under different soil and land conditions, district drainage, etc.

Vocational course; second semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.00.

E. Irrigation Farming Practices. The most effective methods of handling irrigation waters, the different crops under irrigation, and the cost and profits thereof. Organization as affecting water use and control in irrigated districts.

Elective; Vocational course; first semester; 2 credits; 2 recitations. Fee \$0.50. Text: Fortier, *Use of Water in Irrigation*.

G. Dry Farming Practices. Methods of handling soils under dry farming conditions, tillage, seeding, moisture control, usable water capacity of dry farming soils; root systems of dry-land plants, etc.

Elective Vocational course; second semester; 2 credits; 2 recitations. Fee \$0.50.

VETERINARY MEDICINE

BENNETT THOMAS SIMMS, Professor
Instructor

The object of the courses in veterinary medicine is to help fit the students for the successful handling of live stock. Comparative anatomy and comparative physiology familiarize the student with the normal structures and functions of the animal body, thus laying a foundation for courses in judging, breeding, feeds and feeding, nutrition, and diseases of animals.

The work with diseases is taken up from the standpoint of the live-stock owner. The students learn to recognize diseases, to care for sick animals and to prevent disease through proper methods of sanitation and management. The importance of quarantine, the different methods of control and eradication of disease, and the role of the stock owners in maintaining this work are considered.

Equipment. This department has its office, physiological laboratory, and lecture room on the second floor of the Dairy Building. Dissections, autopsies, and clinics are conducted in the Veterinary Clinic Building. This building has an amphitheater for clinics, dissecting room, drug and instrument room, dressing room with hot and cold water and shower bath, sufficient stable room for stabling animals used for clinical and experimental purposes, and sufficient storage room for keeping feed for the stock. Laboratory equipment includes mounted skeletons of the horse and cow, complete sets of loose bones, dissected specimens preserved in museum jars, rotary microtome with accessories, microscope, electric oven, electric thermostat, steam and hot air sterilizers, the necessary glassware for physiological laboratory work, and the necessary instruments and drugs for clinical work.

The following courses are offered:

1. **Comparative Anatomy.** Anatomy is taught in the most practical manner possible. Special attention is paid to the digestive systems of the horse and cow; to the foot, the muscles of locomotion, and the teeth of the horse. The laboratory work includes complete dissection of the digestive, urinary, genital, and respiratory systems, and partial dissection of the circulatory, muscular, and nervous systems.

Prerequisites: Zoology 108, 109. Chemistry 500, 501. Junior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$2.00.

2. Comparative Physiology. The study of the functions of the body. Special attention is paid to the digestive system. The physiological processes of all the domestic animals are studied, with special emphasis on the horse and cow. The laboratory work consists of practical experiments which are correlated with the lectures.

Prerequisite: Veterinary Medicine 1. Junior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$1.00.

3. Diseases of Live Stock. The parasitic, infectious, and non-infectious diseases of domestic animals are considered in this course. Special attention is given to the prevention and control of parasitic and infectious diseases. The laboratory work consists of a free clinic, which provides an abundance of both medical and surgical work. The students assist in handling and diagnosing the medical cases, and in operating on the surgical cases. They also observe the results of treatment of all animals in the hospital.

Prerequisites: Veterinary Medicine 1 and 2. Senior year; first semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

4. Diseases of Live Stock. A continuation of course 3.

Senior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

5. Veterinary Histology. The histology of the domestic animals.

Elective; junior or senior year; first semester; credits to be arranged. Fee \$1.00.

6. Veterinary Histology. A continuation of course 5.

Elective; junior or senior year; second semester; credits to be arranged. Fee \$1.00.

11. Anatomy of the Fowl. A study of the structure of the body of the fowl. The laboratory work consists principally of dissection.

Fee \$0.50.

12. Poultry Diseases. The parasitic, infectious, and non-infectious diseases are considered. Special emphasis is placed upon methods of prevention and control of parasitic and infectious diseases. Students observe autopsies, methods of diagnosis, and treatment of fowls.

Junior or senior year; second semester; 2 credits; 1 lecture; 1 laboratory period.

14. Diseases of Live Stock. A one-semester course for Agronomy students. The more common diseases, with the methods of

prevention and control, are considered. The laboratory work consists of a free clinic, which provides an abundance of animals for both surgical and medical treatment.

Prerequisites Zoology 108, 109. Chemistry 500, 501. Junior or senior year; second semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

A. Diseases of Dairy Cattle. A practical course given to the Dairy Husbandry students who are taking the vocational course. Vocational students; first semester; 2 credits; 2 recitations.

B. Diseases of Dairy Cattle. A continuation of course A. The laboratory work consists of a free clinic. The students observe methods of diagnosis and treatment of both medical and surgical cases.

Vocational students; second semester; 2 credits; 1 lecture; 1 laboratory period. Fee \$0.50.

C. Diseases of Domestic Animals. A practical course given to Animal Husbandry students who are taking the vocational course. The laboratory work consists of a free clinic, which provides an abundance of animals for treatment.

Vocational students; first semester; 3 credits; 2 lectures; 1 laboratory period. Fee \$0.50. Text: P. B. Hadley, *The Horse in Health and Disease*.

ZOOLOGY AND PHYSIOLOGY

GEORGE FRANCIS SYKES, Professor
ASA CHANDLER, Instructor
CHARLOTTE NEVIL HURD, Instructor
* HOWARD MARSHALL WIGHT, Instructor

The interests of human life are so intimately bound up in the facts of animal life that today, at least, a general knowledge of the science of Zoology is considered a personal asset few students can afford to omit from their college course. The instruction in this department, therefore, is designed not only to awaken interest in the study of native birds, insects, and other animals in order to afford a basic knowledge of the structure and functions of the animal body, but particularly to develop the faculty for determining the dynamic value of an animal, or a group of animals, in the solution of the problems of everyday life.

By means of lectures, laboratory work, and field observations, the student becomes familiar with the form and habits of various representatives of the animal kingdom, learning something of the mechanism of living things, of their importance as active forces in nature, and of the biological laws according to which their development is regulated. The work is adapted, so far as possible, to the particular needs of students in Agriculture, Forestry, Pharmacy, and Home Economics.

Opportunity is offered, moreover, to those who desire it, to receive training for teaching zoology, physiology, or nature study in the public schools; for development of the game and food resources of the State; or for the pursuance of studies in the field of research. In connection with the course in Pharmacy, the required work forms a valuable pre-medical course.

Equipment. The laboratories of the department occupy the following rooms on the third floor of Agricultural Hall; offices, physiological laboratory, laboratory for embryology and histology, general laboratory for zoology, lecture room, vault, and photographic dark room. The general laboratory is equipped with desks with individual drawers to accommodate 280 students; each desk is provided with compound microscopes, dissecting microscopes, and various minor pieces of apparatus. The physiological laboratory is similarly equipped for 225 students and in addition is provided with an articulated skeleton, a dissectible human skull, a

* On leave of absence.

complete Azoux model of the human body, greatly enlarged Azoux models of the brain, eye, ear, and other organs, a set of the celebrated Leuckart zoological charts, and a good supply of specimens and dissections for illustrating the work in physiology. The laboratories are provided with high-grade compound and dissecting microscopes, a Minot rotating microtome, paraffin bath, eye piece and stage micrometers, and an abundant supply of minor instruments.

As an adjunct to the laboratory facilities a set of nursery troughs for fish cultural purposes has been erected on the campus adjacent to the zoological laboratory.

The museum contains, in addition to a beautiful collection of native birds, a small collection of mounted mammals, the Ladd collection of bird skins, a large collection of eggs of native birds, a small collection of fishes and reptiles, a considerable number of marine invertebrates, including a small but beautiful collection of Philippine shells, and numerous specimens of a miscellaneous nature.

COURSE IN ZOOLOGY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
* Electives	12	15
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
* Electives	13	13
	16	16

* Not less than five credits each semester must be taken in the Major department. Other subjects must be elected with the approval of the head of the department in which the Major is taken.

The following courses are offered:

101. General Zoology. A general introduction to advanced courses in the department; designed also for students who, without

intending to pursue the subject further, desire a general view of zoological work and its problems; lectures and laboratory work supplemented by collateral reading and field investigation, gives general knowledge of different animal forms; distribution; habits; mechanism and functions of body; introduction to laboratory methods of dissection and experiment; outline of biological theories of selection, adaptation, and evolution. Runs throughout the year.

The courses in Pharmacy, Physical Education, and for Pre-medical students; freshman year; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

102. General Zoology. A continuation of 101.

Prerequisite: Zoology 101. The courses in Pharmacy and Physical Education; freshman year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

103. Functional Zoology. A brief course designed to give students in Home Economics some conception of the structure and physiological activities of animals, as a basis for the work in Physiology. The work consists of a general survey of the forms and activities of living organisms, with general reference to the human organism.

The course in Home Economics; freshman year; first or second semester; 3 credits; 2 lectures; 1 laboratory period of three hours.

104. Embryology and Histology. The origin and development of the animal body; the elementary structure of the adult organs and tissues; a study of the chick and pig with reference to other animals and man; practice in micro-technique, killing, fixing, imbedding, sectioning; adapted to the requirements of the general student as well as to those intending to study Veterinary medicine.

Prerequisites: Zoology 101, 102; or 108, 109; or the equivalent. For students in Agriculture, Pharmacy, Physical Education, and other courses; junior or senior year; first semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each. Fee \$2.00. Deposit \$3.00.

105. Embryology and Histology. A continuation of course 104.

Prerequisite: 104. For students in Agriculture, Pharmacy, Physical Education, and other courses; junior or senior year; second semester; 3 credits; 1 lecture; 2 laboratory periods of three hours each. Fee \$2.00. Deposit \$3.00.

106. Game Propagation. A laboratory and reading course, supplemented by field work in the propagation of food animals of the field and forest; the breeding and protection of game birds and mammals; methods of conducting game reservations; and a comparative study of game laws.

Elective for students in Agriculture and Forestry; first semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged. Fee \$0.25.

107. Ornithology. A lecture course and field study of the common birds of Oregon; the course aims to develop an interest in the native birds, their habits, and haunts, with particular reference to their usefulness.

Elective; second semester; 1 credit; 1 lecture; 1 laboratory period; hours to be arranged. Fee \$0.25.

108. Principles of Economic Zoology. Designed for both students in Agriculture and in Forestry; the facts and conditions that render animal life an important factor in the economic problems of life; prefaced by a study of animal forms, distribution, and habits. The physiological functions of the body. Lectures, laboratory work, and collateral reading.

Required of Agricultural and Forestry sophomores; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

109. Principles of Economic Zoology. Continuation of course 108. A dynamic interpretation of life; contact in the field with vital economic problems, agricultural or sylvan. An outline of the different biological theories, natural-selection, adaptation, evolution; acquaintance with their fundamental principles leading to an insight into the more far-reaching significance of every-day problems.

Prerequisite: 108. Required of Agricultural and Forestry sophomores; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

110. Animal Parasites. An advanced course for the study of such parasitic forms as flukes, tapeworms, nematodes, fish "lice," cattle ticks, etc., that affect the health of man, and of domestic and food animals; the study will be primarily ecological, the object being to obtain a more exact knowledge of the conditions which produce parasitism, to the end that by intelligent control,

diseases and economic losses may be rendered less liable, and preventive measures made productive of more permanent results.

Prerequisites: Zoology 101, 108, or the equivalent.

Elective to students in Agriculture, Forestry and Pharmacy, Veterinary Bacteriology; junior or senior year; first semester; 2 credits; hours to be arranged. Fee \$1.00. Deposit \$1.00.

111. Protozoology. An advanced course for the study of microscopic animals with a view to their relation, beneficially or injuriously, to man, particular attention being paid to such pathogenic forms as blood spores and enteric parasites, with some reference to soil protozoans and water animalcules.

Prerequisites: Zoology 101; or 108, or the equivalent. Elective for students in Agriculture, Pharmacy, Aquiculture, and Bacteriology; second semester; 2 credits; hours to be arranged. Fee \$1.00. Deposit \$1.00.

112. Research and Thesis. Opportunity will be given students who desire to specialize in Zoology and Physiology to take up work not given in the regular courses, or to undertake the investigation of special problems. Work for the master's degree, either as a major or as a minor in this department, may be selected. It is the policy of the department to allow the student to develop his own initiative in the selection of a problem, and in outlining and conducting his investigations, but with the cooperation of the head, or other member, of the department.

Elective for seniors and graduates; first semester; credits to be arranged.

113. Research and Thesis. A continuation of course 112.

Elective for seniors and graduates; credits to be arranged. Deposit \$3.00.

114. Aquiculture. Lecture, laboratory, and field course dealing with the problems and methods of sea-farming and fish culture; the hatching and rearing of fish and other aquatic food animals, the planting and care of oyster and clam beds, and a study of the various methods of production and preparation for market.

Prerequisite: Zoology 108, or the equivalent. Elective for Agriculture and Forestry students; first semester; 3 credits; hours to be arranged. Fee \$1.50. Deposit \$1.00.

115. Aquiculture. A continuation of 114, dealing primarily with fresh water problems.

Elective for Agriculture and Forestry students; second semester; 3 credits; hours to be arranged. Fee \$1.50. Deposit \$1.00.

116. Taxidermy and Zoological Collecting. Lecture, laboratory, and field course in the methods involved in the preparation of skins, the preservation of museum specimens, and a study and practice of the methods involved in field survey work.

Prerequisite: Zool. 108, or the equivalent. Elective for Agriculture and Forestry students; second semester; credits to be determined; hours to be arranged. Fee \$1.50. Deposit \$1.00.

120. Genetics. A lecture course dealing with the general principles of heredity, and the factors involved in variation and inheritance; the fundamental principles of breeding. The course will be prefaced by lectures on the phenomena of reproduction; and will be followed by an explanation of the mechanism of heredity, involving a discussion of problems of inheritance of acquired characters, segregation, dominance, and sex determination, with respect to their application both to the human and to the domestic forms. Experimental problems may be outlined for practical investigation for those who may desire to carry on such work.

Elective for juniors in Agriculture and others; first semester; 3 credits; 3 lectures; 1 laboratory period of 1 hour. Fee \$0.25.

122. Racial Biology. Designed not only for the general student but also for students particularly interested in the modern biological background of sociological, psychological, and ethical theory; a study of the biological organization of the human species; our anatomical heritage; evolution and man; heredity in relation to eugenics; dynamic factors and the biological progress of the human race in war and peace; the physiological basis of human behavior; present tendencies in the human species.

Elective for students in Sociology, Education, and others; second semester; 2 credits; 2 lectures. Fee \$0.25.

201. Physiology and Anatomy. Intended not only for the general student, but also for students particularly interested in this branch of Zoology, and for those who expect to study medicine; a study of the structure, significance, and function of the human body, with reference to the animal body in general; the laboratory course includes some work upon the gross anatomy and the histology of the various tissues and organs of a typical mammal; also includes experiments and demonstrations with foods, the study of blood, nerve, muscle, reactions, etc.

Prerequisites: Zoology, 101, 102, or the equivalent. Physical Education freshman, Pharmacy sophomores; elective for other students; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

202. Physiology and Anatomy. A continuation of course 201.

Prerequisites: Zoology 101, 102, 201. Pharmacy sophomores; elective for other students; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

205. Nutritional Physiology. An advanced course dealing particularly with the process of digestion, absorption, nutrition, secretion and excretion.

Prerequisite: 207, or the equivalent. Elective for students in Home Economics and others; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Deposit \$3.00.

207. General Physiology. The object of this course is to give to the Home Economics student the knowledge of life processes and anatomical relationships which will be most useful in maintaining the highest efficiency of the human mechanism; the chief functions of the human body and the laws of health falling naturally within the province of the physiologist, including such experimental, histological, and anatomical work as will best serve the object of the course.

Home Economics; junior year; first semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

208. General Physiology. A continuation of 207.

Home Economics; junior year; second semester; 3 credits; 2 lectures; 1 laboratory period of three hours. Fee \$1.50. Deposit \$1.00.

209. Neuro-Physiology. An advanced course dealing with the special processes and anatomical relationships of the nervous system; an examination of the physiological bases of mental states; experimentation in neuro-muscular reactions; studies in animal behavior. **Prerequisites:** 101, 102, 201, 202, or the equivalent. Elective; Pharmacy and other students; first semester; 2 credits; 1 lecture; 1 laboratory period of three hours. Deposit \$3.00.

A. Elementary Physiology. For the women of the Home-makers' course; an elementary study of the process and organs of digestion, circulation, excretion, reproduction, etc. The physiological basis of the laws of hygiene.

Required of women in the Home-makers' course; first semester; 2 credits; 2 lectures; 1 laboratory period of two hours. Fee \$1.50. Deposit \$1.00.

SCHOOL OF COMMERCE

JOHN ANDREW BEXELL, Dean

The School of Commerce offers two distinct courses of study; namely, (1) a four-years course leading to the degree of Bachelor of Science in Commerce; (2) a two-years vocational course leading to a Certificate. The practical side of every subject is especially emphasized, the constant aim being to train the student for service and efficiency.

The Degree Course. In the degree course freshmen may choose as a major either accounting or secretarial studies, the latter including stenography and office practice. In the junior year, the student may further select a major course from one of the following: (1) Accounting and Business Management, (2) Economics and Sociology, (3) Government and Business Law, (4) Secretarial Studies. Instead of the above options, a liberal range of general electives is offered, so that in the junior or senior year the men may elect courses in Agriculture, Forestry, or Industrial Arts, while the women may elect courses in Home Economics.

The Vocational Course. This course has been arranged primarily for the benefit of persons who have been unable to finish a high-school course. The only entrance requirements are that the applicant must have had an eighth-grade education, or its equivalent, and must be at least eighteen years of age. The student may emphasize bookkeeping and business methods, or stenography and typewriting; or he may have an opportunity to take both courses.

Departments. For administrative purposes, the School of Commerce is organized into four distinct departments: (1) Accounting and Business Management, (2) Economics and Sociology, (3) Government and Business Law, and (4) Stenography and Office Training.

REQUIREMENTS FOR GRADUATION IN THE SCHOOL OF COMMERCE

For graduation in the school of Commerce a total of 136 college credits must be completed by men, and 132 credits by women. It is expected that the suggested schedule as listed elsewhere for

this school will be closely followed. Before graduation a student must complete credits as indicated in the following groups:

General group, such as English, Modern Language, etc., at least 22 credits.

Natural Science group at least 6 credits.

Commerce group at least 66 credits, as follows: Accounting and Business Management 21; or Office Training 21; Economics 21; Government and Business Law 18; Business English 6.

Mathematics group at least 3 credits.

Gymnasium 2 credits for men; 6 credits for women.

Military Science 2 credits for men.

Military Drill 6 credits for men.

Free Electives 29 credits.

DEGREE COURSE IN COMMERCE

Accounting and Business Management

	Semester	
	1st	2nd
Freshman Year		
Accounting (Com. 100, 101)*.....	4	4
Typewriting (Com. 410, 411).....	2	2
Advanced Commercial Correspondence (Eng. 143) or Modern Language	3	
Technical Business English (Eng. 142) or Modern Language		3
Commercial Geography (Com. 200).....	3	
Economic History of Europe (Com. 208).....		3
Commercial Mathematics (Math. 8).....	3	
Contemporary American History (Hist. 62).....		3
Library Practice (Libr. 1).....		$\frac{1}{2}$
Hygiene (Phys. Ed. 10 for Women, 19 for Men).....	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16) for Men.....	$\frac{1}{2}$	$\frac{1}{2}$
Gymnasium (Phys. Ed. 5, 6) for Women.....	(1)	(1)
Drill (Military 3, 4).....	1	1
	<hr/> 17	<hr/> 17

* Students who have not had at least one year of bookkeeping should register for Com. 107 the first semester and Com. 100 the second semester.

	Semester	
	1st	2nd
Sophomore Year		
Accounting (Com. 102, 103).....	3	3
Modern Eng. Prose (Eng. 81, 82) or Modern Language....	3	3
Economic History of the United States (Com. 206).....	3	
Principles of Economics (Com. 210).....		3
Advanced Business Law (Com. 309, 310).....	3	3
History of Oregon (Hist. 70)*.....	3	
Modern European History (Hist. 40)*.....		3
Business Men's Lecture Course (Com. 140, 141).....	1	1
Gymnasium (Phys. Ed. 17, 18) for Men.....	½	½
Gymnasium (Phys. Ed. 7, 8) for Women.....	(1)	(1)
Drill (Military 3, 4).....	1	1
	<hr/> 17½	<hr/> 17½

* Optional with Science: Six credits in sciences are required for graduation. The following are recommended: Chemistry 100, 101; Physics 1, 2; Bact. 101; Zoology 204; or Botany 20. Students who plan to minor in Home Economics are urged to register for the required chemistry in their freshman or sophomore year. (Household Chemistry 12 and 13, 6 credits.)

Stenography and Office Training

	Semester	
	1st	2nd
Freshman Year		
Stenography (Com. 400, 401).....	3	3
Typewriting (Com. 410, 411).....	2	2
Accounting (Com. 100, 101)*.....	4	4
Advanced Commercial Correspondence (Eng. 143) or Modern Language	3	
Technical Business English (142) or Modern Language....		3
Commercial Geography (Com. 200).....	3	
Contemporary American History (Hist. 62).....		3
Library Practice (Libr. 1).....		½
Gymnasium (Phys. Ed. 5, 6) for Women.....	(1)	(1)
Hygiene (Phys. Ed. 10 for Women, 19 for Men).....	½	
Gymnasium (Phys. Ed. 15, 16) for Men.....	½	½
Drill (Military 3, 4).....	1	1
	<hr/> 17	<hr/> 17

* Students who have not had at least one year of bookkeeping, should register for Com. 107 (3 credits) the first semester, and Com. 100 the second semester.

	Semester	
	1st	2nd
Sophomore Year		
Stenography (Com. 402, 403).....	3	3
Modern English Prose (Eng. 81, 82) or Modern Language.....	3	3
Economic History of U. S. (Com. 206).....	3	
Principles of Economics (Com. 210).....		3
Advanced Business Law (Com. 309, 310).....	3	3
History of Oregon (Hist. 70)*.....	3	
Modern European History (Hist. 40)*.....		3
Gymnasium (Phys. Ed. 17, 18) for Men.....	1½	1½
Gymnasium (Phys. Ed. 7, 8) for Women.....	(1)	(1)
Drill (Military 3, 4).....	1	1
Business Men's Lecture Course (Com. 140, 141).....	1	1
	<hr/> 17½	<hr/> 17½

*Optional with Science (see requirements for graduation), or with second year in Accounting.

Freshman Year, Second Semester Registration

	Semester	
	1st	2nd
Bookkeeping (Com. 107).....		3
Modern English Prose (Eng. 81).....		3
Advanced Commercial Correspondence (Eng. 143).....		3
Economic History of Europe (Com. 208).....		3
Principles of Economics (Com. 210)*.....		3
Typewriting (Com. 410).....		2
Gymnasium (Phys. Ed. 16) for Men.....		1½
Drill (Military 4).....		1
		<hr/> 18½

* Optional with Stenography (Com. 400).

	Semester	
	1st	2nd
Junior Year*		
Money and Banking (Com. 230).....	3	
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Business Organization and Management (Com. 110).....	3	
Advertising and Selling (Com. 112).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Practical Sociology (Com. 250).....		3
Free Electives (6-6) (See groups).....	6	6
	17	17
Senior Year*		
Public Finance (Com. 233).....	3	
Transportation (Com. 240).....		3
Comparative Study of Governments (Com. 325).....	3	
International Relations (Com. 302).....		3
Free Electives (10-10) (See groups).....	10	10
	16	16

* The junior and senior schedules may be modified to suit the individual student, provided, that the entire course shall contain not less than 66 nor more than 75 credits in professional subjects, and not less than 39 nor more than 61 credits in non-professional subjects.

VOCATIONAL COURSE IN COMMERCE

	Semester	
	1st	2nd
First Year		
Vocational English (Eng. G, H).....	3	3
U. S. History (Hist. D).....	3	
Civics (Com. N).....		3
Penmanship (Com. U, V).....	2	2
Commercial Arithmetic (Math. M, N)*.....	3	3
Bookkeeping (Com. 107)	3	
Principles of Accounting (Com. 100).....		4
Typewriting (Com. 410-411).....	2	2
Gymnasium (Phys. Ed. 11, 12) for Men.....	½	½
Gymnasium (Phys. Ed. 5, 6).....	(1)	(1)
Drill (Military A, B).....	1	1
	17½	18½

* Optional with Stenography (Com. 400, 401).

Second Year	Semester	
	1st	2nd
Advanced Vocational English (Eng. I, J)*	3	3
Business English (Eng. M, N).....	3	3
Principles of Accounting (Com. 101, 102).....	4	3
Elementary Commercial Geography (Com. H).....	2	
Elementary Industrial History (Com. K).....		2
Business Law (Com. P).....		3
Elementary Industrial Problems (Com. J).....	3	
Penmanship (Com. W, X).....	1	1
Gymnasium (Phys. Ed. 13, 14) for Men.....	$\frac{1}{2}$	$\frac{1}{2}$
Gymnasium (Phys. Ed. 5, 6) for Women.....	(1)	(2)
Drill (Military C, D).....	1	1
	<hr/>	<hr/>
	17 $\frac{1}{2}$	16 $\frac{1}{2}$

* Optional with Stenography (Com. 402, 403).

CIVIL SERVICE COURSE

To meet the urgent demand for stenographic and clerical help during the war, an intensive course in Stenography and Office Training has been arranged. The course may be begun either semester. The entrance requirements are the same as for the Vocational Course.

Beginning Civil Service	Either Semester
Elementary Stenography (Com. 406).....	6
Elementary Typewriting (Com. 415).....	4
Business English (Eng. 143).....	3
Accounting (Com. 107 or 100).....	4
Gymnasium (Phys. Ed. 5) for Women.....	(1)
Gymnasium (Phys. Ed. 15) for Men.....	$\frac{1}{2}$
Drill (Military A).....	1
	<hr/>
	18 $\frac{1}{2}$

Advanced Civil Service

Either Semester

Advance Civil Service Stenography and Typewriting (Com. 407)	6
Technical Business English (Eng. 142).....	3
Penmanship (Com. U).....	2
Accounting (Com. 100 or 101).....	4
Gymnasium (Phys. Ed. 6) for Women.....	(1)
Gymnasium (Phys. Ed. 16) for Men.....	$\frac{1}{2}$
Drill (Military B).....	1
	<hr/>
	16 $\frac{1}{2}$

SUGGESTED ELECTIVE GROUPS

While the student may choose other subjects than those enumerated below, he is strongly urged to adopt one of the suggested groups.

Group 1. Accounting and Business Management

	Semester	
	1st	2nd
Junior Year		
Commercial Pharmacy (Phar. 160).....	3	
Labor Problems (Com. 213).....		3
Practical Public Speaking (Eng. 105, 106).....	3	3
	<hr/>	<hr/>
	6	6
Senior Year		
Accountancy Problems (Com. 105).....		3
Public Accounting and Auditing (Com. 106).....	3	
General Psychology (Ind. Ed. 101).....	3	
History of Education (Ind. Ed. 120).....		3
Economic Organization of Agriculture (Com. 264).....	3	
Insurance (Com. 235).....		3
Thesis (Com. 111).....	1	1
	<hr/>	<hr/>
	10	10

Group 2. Economics and Sociology

Junior Year		
American Literature (Eng. 71, 72) or.....	3	3
Modern Language		
Cooperation (Com. 260).....		3
Science	3	
	<hr/>	<hr/>
	6	6

	Semester	
	1st	2nd
Senior Year		
Accountancy Problems (Com. 105).....		3
Public Accounting and Auditing (Com. 106).....	3	
Insurance (Com. 235)		3
Practical Public Speaking (Eng. 105).....	3	
General Psychology (Ind. Ed. 101).....	3	
History of Education (Ind. Ed. 120).....		3
Thesis (Com. 111).....	1	1
	—	—
	10	10

Group 3. Government and Business Law

Junior Year		
History of English Literature (Eng. 61, 62).....	3	3
Economic Organization of Agriculture (Com. 264).....	3	
Insurance (Com. 235).....		3
	—	—
	6	6

Senior Year		
Advanced American Government (Com. 304).....	3	
Practical Legislation (Com. 328).....		3
History of the British Empire (Hist. 52).....	3	
American Diplomatic History (Hist. 80).....		3
Accountancy Problems (Com. 105).....		3
Public Accounting and Auditing (Com. 106).....	3	
Thesis (Com. 111)	1	1
	—	—
	10	10

Group 4. Teachers' Course

Junior Year		
General Psychology (Ind. Ed. 101).....	3	
Educational Psychology (Ind. Ed. 102).....		2
Principles of Education (Ind. Ed. 131).....	3	
History of Education (Ind. Ed. 120).....		3
Thesis (Com. 111).....	1	1
	—	—
	6	6

SCHOOL OF COMMERCE

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	Semester	
	1st	2nd
Senior Year		
Special Methods (Ind. Ed. 180, 181).....	2	2
Business Organization and Management (Com. 110).....	3	
Labor Problems (Com. 213).....		3
Approved Electives	5	5
	—	—
	10	10

Group 5. Minor in Agriculture

Junior Year		
Soils (Soils 1).....	3	
Crop Production (Farm Crops 1).....		3
Approved Electives	3	3
	—	—
	6	6
Senior Year		
Stock Judging (A. H. 1).....	2	
Live Stock Management (A. H. 2).....		3
Plant Propagation (Hort. 105).....		2
Orchard and Garden Practice (Hort. 103).....	2	
Approved Electives	6	5
	—	—
	10	10

Group 6. Minor in Home Economics

Junior Year		
Food Preparation (H. S. 106)*.....	4	
Food Preparation (H. S. 107).....		4
Approved Electives	2	2
	—	—
	6	6
Senior Year		
Textiles and Clothing (H. A. 104).....	4	
Textiles and Clothing (H. A. 105).....		4
Approved Electives	6	6
	—	—
	10	10

*Students who plan to minor in Home Economics are urged to register for the required Chemistry in their freshman or sophomore years. (Household Chemistry 12 and 13, 6 credits.)

Group 7. Office Training

	Semester	
	1st	2nd
Junior Year		
Office Training for Stenographers (Com. 412).....	3	
Secretarial Training for Stenographers (Com. 413).....		3
Approved Electives	3	3
	<hr/>	<hr/>
	6	6
Senior Year		
Reporters' Course (Com. 404).....	2	
Reporters' Course (Com. 405).....		2
Approved Electives	8	8
	<hr/>	<hr/>
	10	10

Group 8. Minor in Physical Education for Women *

Junior Year		
Theory of Gymnastics (Phys. Ed 41, 42).....	2	2
Massage (Phys. Ed. 47, 48).....	1	1
Physical Exam. and Prescription (Phys. Ed. 49, 50).....	1	1
Physical Education—Practice.....	2	2
	<hr/>	<hr/>
	6	6
Senior Year		
Methods and Practice Teaching (Phys. Ed. 51, 52).....	2	2
Playground (Phys. Ed. 53).....		2
Home Nursing (H. S. 511).....		3
General Psychology (Ind. Ed. 101).....	3	
Basketry (H. A. 402).....	2	
Story Telling (Eng. 192, 193).....	1	1
Physical Education—Practice.....	2	2
	<hr/>	<hr/>
	10	10

* Note: Prerequisites for this course are Zoology, Physiology and Anatomy (201, 202).

COURSE IN FARM BUSINESS AND RURAL LEADERSHIP

For the prescribed group courses for the freshman and sophomore years see Degree Courses in Agriculture, Group I, General Catalogue, pages 79-80.

	Semester	
	1st	2nd
Junior Year		
Economic History of the U. S. (Com. 206).....	3	
Rural Finance (Com. 265).....		3
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Genetics (Zool. 120).....	3	
Practical Sociology (Com. 250).....		3
Cooperative Accounting and Management (Com. 130).....	3	
Dairy Herd Management (D. H. 40).....		3
Soil Fertility (Soils 7).....	4	
Feeds and Feeding (A. H. 23).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	—	—
Senior Year		
	18	17
Public Finance (Com. 233).....	3	
Comparative Governments (Com. 325).....	3	
Economic Organizations of Agriculture (Com. 264).....	3	
Rural Sociology (Com. 252).....		3
Literature and Exposition of the Rural Life (Com. 255).....	3	
Farm Management (Farm Mgt. 1).....		3
Forage Crops (Farm Crops 9).....	2	
Elementary Laboratory Bacteriology (Bact. 102).....		2
Practical Pomology (Hort. 102).....	2	
Approved Electives		8
	16	16

COURSE IN MARKETING AND RURAL ORGANIZATION

	Semester	
	1st	2nd
Freshman Year		
Business English (Eng. 143, 142).....	3	3
Modern Language	3	3
Commercial Geography (Com. 200).....	3	
Economic History of Europe (Com. 208).....		3
Science	3	3
Commercial Mathematics (Math. 8).....	3	
Accounting (Com. 107).....		3
Library Practice (Libr. 1).....	½	
Hygiene (Phys. Ed. 19).....	½	
Gymnasium (Phys. Ed. 15, 16).....	½	½
Drill (Military 3, 4).....	1	1
	<hr/>	<hr/>
Sophomore Year		
	17½	16½
Advanced Business Law (Com. 309, 310).....	3	3
Modern Language (Continuation).....	3	3
Economic History of United States (Com. 206).....	3	
Principles of Economics (Com. 210).....		3
Soils (Soils 1, 2).....	3	3
Accounting (Com. 103).....	4	
Office Training (Com. 410).....		4
Gymnasium (Phys. Ed. 17, 18).....	½	½
Drill (Military 5, 6).....	1	1
	<hr/>	<hr/>
Junior Year		
	17½	17½
Business Management (Com. 110).....	3	
Farm Crops (Farm Crops 1).....		3
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Practical Public Speaking (Eng. 105, 106).....	3	3
Farm Management (Farm Mgt. 1).....	3	
Elements of Dairying (D. H. 1).....		3
Animal Husbandry, Stock Judging (A. H. 1).....	2	
Live Stock Management (A. H. 2).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/>	<hr/>
	16	17

SCHOOL OF COMMERCE

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Senior Year	Semester	
	1st	2nd
Markets and Marketing (Com. 283, 284).....	3	3
Economic Organization of Agriculture (Com. 264).....	3	
Rural Finance (Com. 265).....		3
Transportation (Com. 240).....		3
Insurance (Com. 235).....		3
Electives	11	5
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	17	17

ACCOUNTING AND BUSINESS MANAGEMENT

JOHN ANDREW BEXELL, Professor
JOHN B. HORNER, Professor of History
ERWIN BERTRAN LEMON, Assistant Professor
RUSSEL MARION HOWARD, Instructor

The distinctive work of the department of Accounting and Business Management in the School of Commerce is to train men and women for efficient business management. This includes thorough courses in the various phases of Accounting, Auditing, Business Organization, Scientific Management, Advertising, and Salesmanship.

While the courses in Accounting and Business Management are primarily designed to fit students for the countinghouse and business office, including banking, it is found that such positions are generally only stepping stones to more advanced positions of trust and responsibility. A large percentage of the commercial students eventually engage in business of their own.

The School of Commerce has taken a leading part in developing courses in business methods especially adapted to the farm, the home, and cooperative enterprises. Such courses are given not only in residence but also by correspondence.

When it is remembered that every vocation has its business side, and that this phase of all pursuits is receiving increasing attention, it is apparent that the avenues of employment and the chances for promotion by the really competent business expert are almost unlimited. As a preparation for law or public accounting, this course, combined with economics and political science, is especially attractive. A large proportion of the graduates in Commerce find employment as teachers of commercial subjects in state and private schools; to them the courses in business management are very important.

Equipment. The department of Accounting and Business Management occupies the top floor of the east wing of Agricultural Hall. It is completely equipped for thorough and efficient work in modern business courses. Each room is specially designed and furnished for the work to be conducted in it. The furniture of the department consists of individual desks and counters, a complete set of modern banking fixtures, a wholesale house, a retail house, a commission house, freight, real estate, and insurance offices. Permanent blank books, letter files, rubber stamps, copying presses,

blanks and similar material are provided by the College. A Burroughs Adding Machine is in constant use in the department. The room for typewriting contains fifty-five standard machines, each provided with approved conveniences for the operator. The office training laboratories are furnished with desks designed for convenience in practical work, and contains a variety of equipment for illustrating various systems of filing.

COURSES IN ACCOUNTING AND BUSINESS MANAGEMENT

For outline of courses in Accounting and Business Management consult pages 180-181.

The following courses are offered:

100. Principles of Accounting. Modern accounting as practiced in the best business establishments of the country, forms the basis of the course. The use of special columns, controlling accounts, and their adaptations, is carefully studied. Labor-saving devices of all kinds are studied with a constant view to secure greater accuracy and to diminish work. A great deal of practice in retail, wholesale, and commission accounting, and the preparation and interpretation of financial statements is required. In connection with partnership accounts, a careful study is made of opening and closing entries; adjustments of profits and losses; consolidation of firms; changing from partnership to single proprietorship, and vice versa. The practical side of every phase of the course is emphasized by various sets of books which the student prepares under the supervision of the instructor.

Prerequisite: Course 107 or equivalent. Commerce; *freshman year; Vocational Course, first year; either semester; 4 credits; 3 recitations; 3 laboratory periods. Fee \$1.00. Text: 20th Century Bookkeeping and Accountancy.

101. Practical Accounting. (a) **Corporation Accounts.** A presentation of the theory of manufacturing bookkeeping and the preparation of a set of books illustrating corporation bookkeeping as applied to manufacturing business. (b) **Bank Accounting.** A thorough course in modern bank accounting. The organization of private, state, and national banks, trust companies, and other financial institutions. (c) **Short Accounting Systems.** A further

* Freshmen who have not had one year of bookkeeping should register for course 107.

study of the use of special column books and filing devices, with reference to the saving of time and labor in bookkeeping, as applied to modern business houses. The practical work also consists of the preparation of sets of books illustrating the principles involved.

Commerce; freshman year; Vocational Course; second year; either semester; 4 credits; 3 recitations; 3 laboratory periods. Prerequisite: Course 100 or equivalent. Fee \$1.00. Text: A large number of practical problems and exercises selected from various sources.

102. Accounting and Business Practice (a) **Theory of Accounting** including depreciation, reserves, and investment accounting; advanced form of final statements; the statement of affairs and deficiency account; realization and liquidation. (b) **Business Practice**. The business practice course is designed to supplement all the theoretical courses and to develop initiative and originality. The offices are thoroughly equipped with modern labor-saving appliances, such as filing devices, loose-leaf books, adding machines, duplicating devices, etc. U. S. Office of Markets, Elevator Accounting and Organization of Cooperative Enterprises.

Prerequisite: Course 101. Commerce; sophomore year; Vocational; second year; either semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Texts: Klein, Elements of Accounting. U. S. D. A. Bulletins.

103. Cost Accounting. This course covers the broader economic phases of accounting. Emphasis is laid on accounts as a means of administrative control and economy of production. (a) **Theory of Cost Accounting**. The elements of costs; cost and stock records; relation of cost accounts to the financial records; distribution of overhead; cost statements; graphical representation of costs. (b) **Factory Costs**. A laboratory course especially adapted to a manufacturing business with a considerable pay-roll. (c) **Farm Costs Accounts**. A system of cost accounts adapted to the farm or any productive enterprise.

Prerequisite: Course 102. Commerce; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Wildman, Principles of Cost Accounting. Rowe, Cost Accounting.

105. Accounting Problems. In the efficient administration of a business of some magnitude, the accounting department is of first importance. In it, difficult problems arise, which require not

only accounting skill, but judgment and executive ability. This course covers a large variety of practical problems viewed from the standpoint of the manager rather than the accountant. The material is drawn from certified public accountancy examinations and other sources. The student does not follow any prescribed form of treatment or solution, but is expected to develop analytical initiative, resourcefulness, and originality.

Prerequisite: Course 103. Elective; senior year; second semester; 3 credits; 3 recitations; 1 laboratory period. Text: Cox, C. P. A. Problems. Original Exercises.

106. Public Accounting and Auditing. (a) **Public Accounting.** This course embraces a study of accountancy as a vocation; the C. P. A. laws of the various states are studied and compared; an analysis and interpretation of accounts and financial statements; terminology and procedure in public systems form an important part of this course. (b) **Auditing.** The duties and responsibility of the auditor; his function in the executive staff; his relation to the accounting department; different classes of audits; investigation in the conduct of utility corporations, municipalities, and public institutions. Typical audits will be studied and compared.

Prerequisite: Course 105. Elective; senior year; first semester; 3 credits; 3 recitations; 1 laboratory period. Text: Montgomery, Auditing in Principle and Practice. Harvard Bulletins.

107. Bookkeeping. A thorough but rapid study of the general principles of bookkeeping. The aim of this course is twofold; first, to prepare the student for the study of an advanced set of books adapted to his particular vocation; second, to afford those students entering the Vocational or Degree Courses in Commerce who have not had a year of bookkeeping an opportunity to secure additional instruction which will enable them to carry Course 100.

Commerce; freshman year; Vocational course; first year; either semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: 20th Century Bookkeeping and Accountancy.

108. Special Accounting. In this course the student is given an opportunity to apply the principles of accounting to his special needs, the course being designed primarily for engineering students. Cost accounting, and corporation accounts and statements receive special attention.

Prerequisite: Course 107 or equivalent. Electrical Engineering Course (elective to others); freshman year; second semester; 1 recitation; 2 laboratory periods.

109. Farm Accounting and Business Methods. (a) **Farm Accounting.** This part of the course consists of a thorough discussion of a system of accounts suited to the farm. Cost accounting is especially emphasized, with a view to determining the results of different enterprises. (b) **Business Organization.** Individual proprietorship, partnership, joint-stock companies, and corporations are carefully studied and their adaptations discussed from the standpoint of efficiency; the status of stockholders; the rights and obligations of bondholders; and the functions of officers and directors are treated in detail.

Agriculture; freshman year; first semester; 2 credits; 2 recitations. Texts: Bexell and Nichols, Principles of Bookkeeping and Farm Accounts. Robinson, Organizing a Business.

110. Business Organization and Management. (a) **Business Organization.** General nature of business organization; evolution and forms; structure and life-history of typical corporations; the corporation and trust problem; public utility corporations; reorganization and receivership; blue sky laws and state control. (b) **Parliamentary Practice.** A brief discussion of parliamentary practice and procedure as applied to corporate business. (c) **Business Management.** This part of the course emphasizes internal organization for the purpose of securing efficiency; departmental organization and coordination; various systems of scientific management are studied and compared.

Commerce; junior year; first semester; 3 credits; 3 recitations. Texts: Haney, Business Organization. Gowin, The Executive and His Control of Men. Babson's Reports.

111. Thesis. A research course and treatise on the organization and management of a business in which the student is especially interested. The subject of the thesis must be chosen at the time of registration, and a complete outline approved by the professor in charge not later than November 1. When the thesis is approved, a bound (either printed or typewritten) copy must be deposited in the College library.

Prerequisite: All College courses in Accounting and Business Management. Open only to seniors; both semesters; 1 credit each semester.

112. Purchasing and Selling. (a) **Purchasing.** Principles of purchasing; relations of buying to successful merchandising and manufacturing; ethics of buying; the purchasing organization; records of purchasing; stores, their function and operation; mar-

kets; agents; brokers; jobbers; wholesalers; transportation; reports and statistics. (b) **Advertising.** A study of the fundamental principles of modern advertising. Special emphasis is given to the peculiarities of composition in newspaper and circular advertising, proof reading, effectiveness of design, illustration and display, follow-up systems, etc. (c) **General Principles of Salesmanship.** Business ethics; wholesaling and retailing; brokerage and commission; specialty selling; the sale of service; planning a selling campaign; special sales; prices; correct buying.

Commerce; junior year; second semester; 3 credits; 3 recitations. Texts: Twyford, Purchasing. Neystrom, Retail Selling. Babson's Reports.

120. Household Accounts. A course dealing with the business side of the household. The family income and its distribution; the planning of the annual budget; a simple but complete system of household accounts based on the budget; private accounts as a basis for encouraging thrift among members of the family; bank accounts and their relation to household finance; savings and how they grow.

Home Economics; sophomore year; first semester; 1 credit; 1 recitation. Not given in 1918-19.

122. Business Management for Women. The aim of this course is to treat in a practical way the ordinary rules and methods of conducting business affairs. Two distinct phases are emphasized as follows: (a) **Finance.** Value of money, how savings grow, banking and credit, general principles of investment, loan associations, bonds, stocks, and insurance. (b) **Fundamentals of Business Law.** The principles of the law of contracts, of negotiable paper, mortgages, real property, and wills.

Home Economics; elective to juniors and seniors; second semester; 2 recitations. Text: Cromwell, American Business Woman.

130. Accounting and Management of Cooperative Enterprises. This course covers the business management of cooperative societies. It includes such subjects as the organization of the employees; structure of buildings; office arrangement and equipment; correspondence and filing; bookkeeping and cost accounting especially adapted to different types of cooperative associations in the United States, such as creamery associations, cow-testing associations; auditing, banking, and finance; purchasing, advertising, selling; depreciation of assets; conduct of membership meetings; annual reports and audits; statistical analysis of operations.

Farm Management; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Texts: Robinson, Organizing a Business. U. S. Bureau of Markets Bulletins.

140. Business Men's Lectures and Reading. (a) **Lectures.** A series of lectures on practical business subjects will be given during the year by prominent business men of the State. (b) **Reading.** An assignment of reading will be made at the beginning of the semester covering such phases of the lectures as are best suited to the needs of individual students. (c) **Parliamentary Practice.** A thorough study of parliamentary law and procedure with much practice in organizing and conducting deliberative assemblies.

Commerce and Elective; sophomore year; first semester; 1 credit; 1 recitation. Text: Gregg, Parliamentary Law.

141. Business Men's Lectures and Reading. A continuation of course 140. Second semester; 1 credit.

150. Forestry Accounting. (a) A brief, intensive study of the fundamental principles of double-entry accounting. The theory of debit and credit, labor-saving features, controlling accounts and their adaptations. The purpose of this course is to give the student the necessary foundation for the second part of the course, which deals with the lumber industry.

(b) This part of the course will consider especially those systems of accounts, forms, and records, which are adapted to the lumber industries. Cost accounting and statements receive especial attention. It is not intended to make of the student a professional accountant, but rather to teach him accounting as a means of control and the proper methods of analyzing the different operations connected with the business.

Logging Engineering; freshman year; elective second semester; three credits; 2 recitations; 1 laboratory period.

160. Military Business Practice. A study of the business methods and accounting in the United States Army as represented by its blanks and forms, and the regulations governing the use of the same. The business methods of the Supply and Adjutant General Department will be analyzed and compared with those used in civil life. Considerable outside reading will be required to obtain credit in this course.

Open to all juniors and seniors; second semester; 2 credits; 2 recitations.

D. Dairy Accounting. The same general course as E, except that in the last third of the course special attention will be given

to the development of a system of accounts suited to the dairy business.

Dairy Vocational Course; second semester; 3 credits; 2 recitations; 1 laboratory period. Texts: Bexell and Nichols, *Principles of Bookkeeping and Farm Accounts*. I. C. S., *Cost Accounting*. Robinson, *Organizing a Business*.

E. Farm Accounting and Business Methods. (a) **Accounting.** Students who are not acquainted with the elements of double-entry bookkeeping will be required to work out several practice sets and master the theory of accounts before taking up farm accounting. (b) **Business Methods.** A thorough course in the essentials of business methods required on a well-managed farm. Financial accounts and statements, cost accounts and special records, business methods, business organization, business correspondence and forms; household and personal accounts.

This course may also be taken by correspondence.

Agriculture; Vocational Course; second semester; 3 credits; 3 recitations. Texts: Bexell and Nichols, *Principles of Bookkeeping and Farm Accounts*. Robinson, *Organizing a Business*.

F. Shop Accounting. A course in the theory and practice of accounting especially adapted to the shop. Sufficient time is devoted to the fundamental principles of bookkeeping to familiarize the student with the use of special columns and various labor-saving devices. A special set of books adapted to the shop is then studied and prepared, making the course exceptionally practical.

Mechanic Arts; third year; second semester; 2 credits; 2 recitations. Text: Miners, *Bookkeeping*. Original exercises.

U. Penmanship. Students entering the first year are expected to have acquired a good hand in the grades, but considerable time is devoted during the first year to mastering the best form of business writing and lettering.

Vocational Course; first year; either semester; 2 credits; 2 recitations.

V. Penmanship. A continuation of Course U.

Vocational Course; first year; second semester; 2 credits; 2 recitations.

W. Advanced Penmanship. Special emphasis is laid on rapid business writing, correct forms of business papers, lettering, and designing.

Vocational Course; second year; first semester; 1 credit; 1 recitation.

X. Advanced Penmanship. A continuation of Course W. Second semester; 1 credit; 1 recitation.

ECONOMICS AND SOCIOLOGY

Markets and Rural Organization

HECTOR MACPHERSON, Professor
NEWEL HOWLAND COMISH, Associate Professor

Instructor

The work of this department of the School of Commerce serves a three-fold purpose:

(1) **To train both men and women for citizenship.** Every citizen has business relations requiring a knowledge of the fundamental principles of political economy. Then, too, the necessity of such knowledge is especially felt in a democracy where every man and woman has the right to vote, and is called upon to mold legislation directly. The basis for intelligently exercising this paramount duty of citizenship can only be supplied by a training in economics and sociology the problems of which form the subject matter of all legislation.

(2) **To provide courses supplementary to the various branches of applied science.** To the agricultural college belongs the special task of developing the field of Agricultural Economics and Rural Sociology. It is the aim of this department to provide the necessary training for teachers in these subjects, to prepare specialists for research work in economic and social surveys of rural communities, and to equip those who will make a life work of organizing farmers' associations for the more economical conduct of the business side of farming.

(3) **To do field work.** The Bureau of Organization and Markets. At its meeting October 9, 1914, the Board of Regents established the Bureau of Organization and Markets for the purpose of assisting farmers in the marketing of their products.

The work of the bureau is, in the first place, investigational. It aims to find out the conditions fundamental to successful marketing, and to place the results of its investigation at the disposal of all who are interested.

In the second place, it is at the service of any group of farmers contemplating the establishment of any sort of business organization. It has worked out model constitutions and by-laws and standardized systems of accounting; it has lists of equipment and can guide the farmers to where such equipment can be most

cheaply obtained. It will also assist organizations in planning the kind of plants necessary to carry on their business.

Equipment. The department has for some years been developing a commercial museum for use in the various courses in economic and social science. The museum has now grown to such an extent that it is a very important factor in making the work of the department practical and successful. The Bureau of Organization and Markets also has a collection of bulletins, pamphlets, lantern slides, and documents illustrating the farmers' marketing and organization movement in all parts of the world.

GRADUATE COURSES IN AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

Courses will be outlined leading to the degree of Master of Science in Agricultural Economics and Rural Sociology. It is strongly recommended that students wishing to pursue this work, take the Agricultural course during their first two years in College, and that they follow the work outlined in the course in Farm Business and Rural Leadership on page 189, during their junior and senior years.

Students taking the regular Commercial course, who contemplate studying for a Master's degree in Agricultural Economics and Rural Sociology, should commence with their sophomore year to take certain courses in Agriculture which will be chosen in consultation with the deans of the schools of Agriculture and Commerce.

Our aim is to make the graduate work in this course fit students for County Agriculturists, positions in the U. S. Department of Agriculture, especially in the office of Markets and Rural Organization, teachers in rural high schools, and for Rural Leadership in general. Students will also be prepared for Civil Service examinations in this general field.

For outline of courses in Economics and Sociology in the School of Commerce consult pages 185-186.

The following courses are offered:

200. Commercial Geography. The fundamental conditions underlying all industry and all commerce are taken up in detail. First of all basic elements as climate and topography are investigated, as they mold transportation and commerce and the production of animal and vegetable products. Then the natural resources

of the different countries of the world are treated with especial emphasis upon those of the United States.

Specimens from the Commercial Museum will be used by the students in making reports on the production and manufacture of the principal raw materials and their relation to the development of the countries from which they come. The course presupposes a fair knowledge of physical and political geography and of general history.

Freshman Commerce, freshman Industrial Engineers, sophomore Mechanical Engineers; first semester; 3 credits; 3 recitations. Text: Smith, Commerce and Industry.

205. Economic History of the United States. This course follows and develops out of the previous work in Commercial Geography and the History of Commerce. On the basis of a knowledge of our natural resources and of the previous commercial and economic development of the world, we attempt to outline and interpret the economic progress along many lines which has been made by the United States. The development of agriculture, the growth of manufacturing, the improvement of transportation, the history of labor organization and legislation, the evolution of our monetary and credit systems, changes in the protective tariff, etc., are traced from Colonial times onward.

Prerequisites: Commerce 200, 205. Sophomore year; first semester; 3 credits; 3 recitations. Text: Bogart, Economic History of United States. Callender, Economic History of United States.

208. Economic History of Europe. The development of commerce from the time of the Phoenicians. The commercial achievements of some of the early nations. The industrial development of Great Britain, as a basis for the study of the United States, in course 206, including the rise and breaking down of feudalism, important changes in agriculture, Guild system, rise of the factory system, and its results, the market system, and England's present industrial position.

Freshman year; second semester; 3 credits; 3 recitations. Texts: De Gibbins, Industry in England. Bland, Brown and Lawney, Select Documents in English Economic History.

210. Principles of Economics. A general course covering the elementary problems of our industrial and commercial organization, including the nature of wealth, its production and consumption, and the different forms in which it is found; the conditions under-

lying its success in agriculture and manufacturing; the localization of industry and the relation of raw material to manufacturing; the law of diminishing returns; division of labor and efficiency in production; exchange and distribution and their dependence upon the price-making process, the factors determining prices, wages, interest, and rent; the problems of taxation; public expenditures; protection and free trade; money and banking; labor problems and transportation.

Textbook, lectures, and reports on assigned readings.

Prerequisites: 200 and 206. Forestry; junior year; first semester; Commerce and Engineers, sophomore year; second semester; 3 credits; 3 recitations. Text: Ely, Outline of Economics. Brown, Questionnaire and Syllabus.

211. Principles of Economics. A course especially adapted for students in Home Economics. Not open to Commerce students.

Home Economics; junior year; first semester; 2 credits; 3 recitations. Texts: Ely, Outline of Economics. Brown, Questionnaire and Syllabus.

213. Labor Problems. Begins with a brief historical review of the rise of a labor class. The influence of occupation upon the laborer; and the different types of labor and the problems involved in the occupations represented by the several technical departments of the College, will be studied. Then follows the beginnings of organization; the structure, aims, methods of offence and defence, and achievements of associations of labor. The trade agreement, the strike, the boycott, the lockout, methods of conciliation and arbitration, the application of the injunction in labor disputes, the political activity of labor organizations, employers' liability, legislation, workingmen's insurance, profit sharing and cooperation in relation to labor problems, will be taken up with the aid of a textbook, lecture, and assigned readings. Studies will be made of typical historical and current labor disputes and embodied in term papers and class discussion.

Prerequisite: Commerce 210. Commerce and Forestry; junior year; second semester; 3 credits; 3 recitations. Text: Groat, Organized Labor in America.

219. Agricultural Economics. The fundamental principles of production, distribution, and consumption are taken up with especial reference to agriculture. The aim of the course is to acquaint the student with the laws of supply and demand and the influences determining them. A brief history of agricultural production is

taken up, showing the growing complexity of the economic problems of taxation, transportation, marketing, etc., as the transition is made from self-sufficing, general farming to localized, commercial agriculture.

Agriculture; junior year; first semester; 3 credits; 2 recitations and one lecture (of sections combined).

230. Money and Banking. (a) **Money.** The nature and functions of money, legal tender, Gresham's law, coinage; the factors affecting prices, and their relation to business conditions; a brief history of the various forms of paper currency; silver legislation; present problems and conditions.

(b) **Banking.** Procedure in organizing state and national banks; history of banking, including our National Banking System as modified by the Federal Reserve Bank Act of 1913; the functions of banks; the preparation and analysis of bank statements; loans and the granting of credit, securities required; rediscount; duties of the various bank officers; legal principles of banking; the principles underlying foreign exchange; a comparison of our banking system with that of foreign countries.

Prerequisite: Commerce 210. Commerce; junior year; first semester; 3 credits; 3 recitations. Text: Holdsworth, Money and Banking.

233. Public Finance. An examination will be made of public expenditures, local, state, and national. For this purpose, typical financial budgets and reports will be analyzed. A history of reforms calculated to secure efficiency in these expenditures will be sketched. The various forms of taxes, customs, and fees whereby revenues are raised, will be taken up in detail and their apportionment studied in relation to the budgets previously analyzed. Present systems of land taxation will be studied in the light of proposed reforms. An attempt will be made to give the student some laboratory practice through the study of local systems of assessment and the resulting apportionment of taxes.

Commerce; senior year; first semester; 3 credits; 3 recitations. Texts: Plehn, Introduction to Public Finance. Bullock, Selected Readings in Public Finance.

235. Insurance. A course designed to cover, in a general way, the whole field of insurance. The nature and statistical basis of different kinds of insurance will be first treated. Then the application of the principles discovered to different forms of insurance,

such as straight life, endowment, accident, industrial, old age, fire, live stock, hail, etc., will be taken up in detail.

Elective; junior and senior years; second semester; 3 credits; 3 recitations. Text: Assigned readings and lectures.

240. Transportation. The relation of transportation systems to industrial and commercial progress; a brief historical review of the development of systems of transportation; the organization and financing of different systems; the effects of competition in the railroad business; freight classification, and the making of rates and fares; the necessity of government control, and attempts at regulation by state and federal governments; government ownership in the light of European experience.

Senior year; second semester; 3 credits; 3 recitations. Texts: Ripley, Railroads; Rates and Regulations. Johnson and Huebner, Railroads; Rates and Traffic.

250. General Sociology. In this course, social theory will be subordinated to the study of practical social problems. The different social and political units, such as the family, school, church, club, city, state, and nation will be discussed in their relation to the general welfare. This will necessitate an examination of the organization, purpose, and methods of each of these functional groups, involving a discussion of the training of children, employment of women and children, marriage and divorce; the labor movement as a factor in the struggle for existence; overcrowding in city slums, and its amelioration; the causes of pauperism, immorality, and crime, with modern methods of their treatment, etc. A good general textbook will be studied and the whole field covered in class discussion and assigned readings.

Junior year; second semester; 3 credits; 3 recitations. Texts: Blackmar and Gillin, Outlines of Sociology. Carver, Sociology and Social Progress.

252. Rural Sociology. This course will deal with the special problems of the rural family, the rural school, the rural church, rural societies and associations, and the relation of the State to the general rural welfare. This will involve an inquiry into the prevailing ideals of the rural community regarding labor and leisure; art, literature, and music; and the necessity for recreation. Recent progress in adapting education to rural needs will be discussed. City over-crowding will be examined from the rural point of view, and the lessons which the rural community can learn from the progress made by cities in solving their problems, will be

emphasized. The social and educational effects of the telephone, free mail delivery, rural press, and improved methods of agricultural production and exchange, will be discussed in detail. The best textbooks in the field will be carefully studied, and the whole ground covered in class discussion and assigned readings.

Elective; junior and senior year; second semester; 3 credits; 3 recitations.

253. Applied Sociology. A problem course dealing with the application of the principles of sociology to social betterment. The juvenile court, the reform school, care of defectives, the application and effects of eugenics legislation, etc., will be investigated.

Open to students who have had either Commerce 250 or 252; first semester; 3 credits; 3 recitations.

254. National Vitality. A one-credit course, covering the general field of national vitality, its importance, the conditions underlying it and the means of maintaining such conditions. The economic and social waste due to disease, alcohol, and vice will be treated in a series of lectures by experts from different departments of the College. Outside specialists will also be secured to lecture upon particular phases of the subject. Besides taking notes on the lectures, each student will be required to make an abstract of not less than three hundred pages of assigned readings.

Elective for all students; first semester; 1 credit; 1 recitation.

Note: This course will not be given unless at least fifteen students register for it.

255. The Literature and Exposition of Rural Life. A critical study will be made of the general field of literature bearing upon rural life. Typical interpretations of rural life will be taken from the best poetry and prose. The rural press will be studied with a view to estimating its sociological and economic influence. Themes will be prepared upon current economic and sociological topics and the subject matter discussed in the class room to familiarize the student with the problems involved in the Rural Life movement.

Elective; junior and senior year; first semester; 3 credits; 3 recitations.

260. Cooperation. This course takes up the origin and development of the cooperative movement in Europe, and its introduction into the United States. It sets forth the general principles underlying the economic and social activities of cooperative associations. Then, following this, the different types of organization, the methods by which they are formed, their working plans in

different enterprises, and the factors which determine their success or failure, will be studied in detail. The store, the factory, the dairy and cow-testing association, the credit organization, etc., will be taken up systematically, and the advantages and difficulties of cooperation will in each case receive careful analysis.

Elective to juniors and seniors who cannot take Commerce 264 and 265, and who have had considerable training in Economics. First semester; 3 credits; 3 recitations.

264. The Economic Organization of Agriculture. This course, together with 265, is designed to give a more specialized training in the economic problems of agriculture than is possible in the general course outlined under 219.

In both courses, 264 and 265, economic problems are discussed from the standpoint of the efficiency to be attained through closer organization. Existing associations of farmers both in this country and in Europe will be carefully studied by means of sample constitutions and by-laws, and also by lantern-slide illustrations of the work actually being accomplished through cooperation in Europe and America. The aim is to turn out men trained to play their part in the revolution in agricultural business methods which is now sweeping over this country.

(a) **Economic Problems of Production and Marketing.** Old methods and their weakness are examined, and the possible savings through organized business are investigated.

(b) **The Purchase of Farm Supplies.** The purchasing end of the farm business is about as important as the selling of farm products. Present methods will be taken up in detail, and the possibility of eliminating waste and duplication thoroughly discussed and illustrated.

(c) **The Problems of Transportation as Affecting the Farmer.** The economic significance of the good roads movement will be dealt with; systems of rail and water transportation will be taken up, government control discussed, and the possibility of eliminating waste through precautions on the part of the shippers pointed out.

Open to all who have had 219 or its equivalent; elective for juniors and seniors; first semester; 3 credits; 3 recitations.

265. Rural Finance. (a) **Rural Credit.** The principles of money, credit, and banking will be sufficiently studied to lay the foundation for the examination of the credit needs of the rural

communities, and the most economical means of satisfying them. The reasons why farmers have been so poorly served by existing credit institutions will be investigated. The credit institutions of Europe will be compared with those of the United States; the development of cooperative credit in European countries will be carefully studied, and the present widespread movement to adapt cooperative credit institutions to American rural conditions will be closely followed; farm credit and land settlement; colonization policies.

(b) **Rural Insurance.** The basis of insurance of different kinds will be taken up, and applied to agricultural needs; old line, mutual, and fraternal organizations will be examined from the standpoint of efficiency and safety.

(c) **Rural Taxation.** The general principles of public finance will be taken up in so far as may be necessary to lay the foundation for an intelligent discussion of rural taxation; existing systems, as well as proposed reforms, will be examined.

Open to all who have had 219 or its equivalent; elective; junior and senior year; second semester; 3 credits; 3 recitations.

270. Problem Course. Students especially interested in Applied Economics may select some problem within the scope of the work characteristic of the College, and under the direction of the instructor in charge prepare a thesis embodying the results of an investigation made during the senior year.

Elective; senior year; both semesters; 1 credit (each semester); consultation by appointment.

280. The Economics of Distribution. A seminar covering the whole subject of the distribution of wealth, preparatory to graduate and thesis work in Agricultural Economics and Rural Sociology.

Open to graduate students who have had 219, 264, and 265 or an equivalent training.

281. The Economics of Distribution. Continuation of course 280. This course is required in order to receive credit for first semester's work.

Open to graduates who have had 219, 264, and 265 or equivalent training; both semesters; 3 credits; 3 recitations.

Note: This course will be given as a seminar by special arrangement.

283. Markets and Marketing. The development of marketing systems; the study of local, state, and national commercial programs and policies; commercial clubs, boards of trade, chambers of commerce, speculation organized and unorganized; foreign trade relations, the consular service, commercial treaties, tariffs, bounties, and foreign exchange.

Open to graduate students who have had Commerce 280. First semester; 3 credits; credit not given for one semester's work.

284. Markets and Marketing. Continuation of course 283. This course is required in order to receive credit for first semester's work.

Open to graduate students who have had Commerce 280, or equivalent work; both semesters; 3 credits; 3 recitations.

Note: This course will not be given in 1918-19 unless demand warrants it.

H. Elementary Commercial Geography. Especially adapted for Vocational students. A general survey will be made of the fundamental conditions affecting industrial and commercial development. This will be followed by a study of the natural resources, industries, products, and commerce of the United States, and each of the principal countries of the world. Emphasis will be laid upon the reasons for the organization of industry. Materials from the Commercial Museum will be used in connection with the course.

Vocational Mechanic Arts, second year; vocational Commerce, second year; first semester; 2 credits; 2 recitations.

I. Business and Social Organizations. A discussion of the principles of better business and better living that should accompany the general improvement in farm methods, which it is the purpose of this school to promote. The general application of the economic laws of consumption, distribution, and production to the business side of farming, and the social and economic results of agricultural organization will be studied by the aid of textbook, lectures, and assigned readings.

Vocational Agriculture; first semester; 3 credits; 3 recitations.

J. Elementary Industrial Problems. Especially designed for Vocational students in Industrial Arts and Commerce. It aims to give them some insight into the economic problems with which

they have to deal. A very condensed outline of the principal economic concepts will be followed by the discussion of industrial organization, labor problems, transportation, marketing, taxation, etc.

Vocational Mechanic Arts, third year; vocational Commerce, second year; first semester; 3 credits; 3 recitations.

K. Elementary Industrial History. A general but comprehensive review of the most important phases of the economic development of the United States. It will include a historical study of such topics as tariff, internal improvements, slavery, banking, industrial development, commerce and shipping, immigration and other similar topics, together with a study of present-day problems, as outlined in the press.

Vocational Mechanic Arts, second year; vocational Commerce, second year; first semester; 2 credits; 2 recitations.

GOVERNMENT AND BUSINESS LAW

ULYSSES GRANT DUBACH, Professor
CHESTER COLLINS MAXEY, Assistant Professor

In the courses in political science proper, the department seeks to instruct in the basic general principles of all government, the construction and operation of modern governments, with particular attention to that of the United States, the rules and principles which regulate the relations of governments with each other. The courses are planned with the purpose of equipping students for an intelligent participation in governmental affairs. The work culminates in the courses of Advanced American Government and Practical Legislation, designed to instruct in the fundamentals of law making. The work implies that as citizens, our students will take a dynamic part in the various activities of government, including law making.

The work of this department of the School of Commerce includes two divisions: business law, and government. In the business law courses, arranged to accommodate students of different preparation and needs, the department endeavors to train the students for practical business affairs, particularly to give the legal information necessary to prevent the common business errors. Special attention is given to industrial and rural problems.

In order to acquaint the student with the rudiments of court procedure, a practical case is tried by the class, the students performing all the parts.

For outline of courses in Government and Business Law in the School of Commerce consult pages 186-187.

The following courses are offered:

302. International Relations. Persons concerned, rights and duties of states; territorial jurisdiction; jurisdiction on the high seas; agents of the state treaties; settlements of disputes; war and its effects; military occupation; neutrality, contraband, blockades, etc. Lectures, reports, and discussions.

Senior year; second semester; 3 credits; 3 recitations. Text: Lawrence, Principles of Public International Law.

304. Advanced American Government. This course will supplement courses 320 and 322 giving chief attention to the interpretation of our federal and state constitutions, and the relation of

legislation to these constitutions. Court reports will be used liberally with a view to showing the interpretation of the rights of the people guaranteed in our constitutions and of the powers granted to the government by these instruments.

Prerequisite: Course 320. Elective; junior or senior year; first semester; 3 credits; 3 recitations. **Text:** Hall's Constitutional Law is used as a basis for the course. Case briefing is required as a large part of the work.

307. Rural Law. A special course supplementary to Commercial Law 300 and 301, elaborating on such questions as fixtures, fences and inclosures, roads, easements, location of land, titles, abstracts, mortgages, legal status of crops in case of termination of lease or sale of land, insurance, irrigation, drainage, and water rights in general.

Elective; junior or senior year; first semester; 1 credit; 1 recitation.

309. Advanced Business Law. (a) Contracts in General. Formation of contracts, offer, acceptance, form, and consideration; competence of parties, consent, and legality of subject matter; operation of contracts, including limit of obligations and assignments; interpretation, rules of evidence, and construction; discharge of contracts; the agreement, performance, breach of contract, etc.

(b) Sales of Personal Property. Subject matter, passage of title, rights of third parties, warranties and remedies.

Sophomore year; first semester; 3 recitations. **Text:** Spencer, Manual of Commercial Law. Bays, Cases on Commercial Law.

Note: Credit will not be given for Commerce 309 without Commerce 310 except on special permission of the department.

309-a. Class work same as 309, special research work required in addition. For graduate students only.

First semester; 3 credits; 3 recitations.

310. Advanced Business Law. Continuation of course 309.

(c) Negotiable Instruments. Maker's, acceptor's, drawer's and indorser's contracts; proceedings before, upon, and after dishonor; proceedings in protesting; accommodation paper; grantor and surety; holder's position, defense, equities, etc.

(d) Partnership and Corporation Law. Comparison of methods of formation, powers, liabilities of members, and dissolution.

(e) Property. Classes, methods of acquiring and transferring titles, mortgages, and leases, landlord and tenant.

The case method is used throughout the entire course. Lectures, reports, and discussions.

Sophomore year; second semester; 3 credits; 3 recitations. Text: Spencer, Manual of Commercial Law. Bays, Cases on Commercial Law.

310-a. Class work same as 310, special research work required in addition. For graduate students only.

Second semester; 3 credits; 3 recitations.

311. Business Law. A short course in the laws of business. Recitations and discussions.

Pharmacy and Farm Management students; second semester; 3 credits; 3 recitations. Text: Huffcut, Elements of Business Law.

320. National Government. (a) **National Government.** The Constitution; rise of the American Union; distribution and powers of the Government; powers of Congress; powers of the executive; the judicial departments; checks and balances of governments; governments of territories and colonies; admission of new states; amendments to the Constitution; civil rights and their guarantees; protection of persons accused of crimes; protection of contracts and property, etc. Lectures, readings, reports, and discussions.

(b) **American Politics.** Origin of political parties in the United States; changes, growth, and development; party platforms.

Junior or senior year; first semester; 3 credits; 3 recitations. Text: Beard, American Government and Politics. Young, New American Government.

322. State and Municipal Government. A study of the functions of state government; the machinery of state government; political parties in state government; special study of the government of the state of Oregon; municipal government, including county, town, and city government.

Lectures, readings, reports, and discussions. Junior or senior year; second semester; 3 credits; 3 recitations. Text: Beard, American Government and Politics. Young, New American Government.

325. Comparative Governments. A critical study of the governments of the principal countries of the world, with special emphasis on modern movements and features of government, that are problems in the United States at present.

Lectures, reports, and discussions. Senior year; first semester; 3 credits; 3 recitations. Text: Ogg, European Governments.

326. Practical Legislation. The work in Advanced American Government would serve as a preparation for this course which will instruct in practical bill drafting. Attention will be given to the correct form, and the correct expression of the desired content of bills. Emphasis will be placed on the necessity of preparing laws with reference to prior legislation and court decisions. In addition, an attempt will be made to show the necessity of studying conditions, and the possibility of guiding legislation to meet the demands of the times. Special emphasis will be placed on rural and industrial legislation.

Prerequisite: Course 304. Elective; junior or senior year; second semester; 3 credits; 3 recitations. Text: Jones, Statute Law Making in the United States.

P. Business Law. Adapted to students of limited training. A course covering the general principles of contracts, and particular contracts including sales of goods, bailment, insurance, credits, loans, negotiable instruments, agency, partnership, corporations, and property.

Vocational course; second year; and Mechanical Arts; third year; second semester; 3 credits; 3 recitations. Text: Huffcut, Elements of Business Law.

N. Civil Government and Administration. (a) **Civil Government.** Our European ancestors; origin of states and state institutions. English and American governments compared; federal and state constitutions; state and foreign service; the executive departments; federal and state power; political parties and issues.

(b) **Federal and State Administration.** A survey of the administrative activities of federal, state, and municipal governments; governments from the sociological point of view. The financial operations, preparation of budgets and reports, will be considered.

Vocational course; first year; second semester; 3 credits; 3 recitations. Text: Ashley, American Federal State.

STENOGRAPHY AND OFFICE TRAINING

ELMER WALKER HILLS, Professor
ETHA MABEL MAGINNIS, Instructor
_____, Instructor
_____, Instructor

The courses offered by this department of the School of Commerce are for four classes of students: (a) those desiring a thorough training as stenographers and typists; (b) those desiring to go still further into the field of court reporting and secretarial training; (c) those desiring to enter the teaching profession; and (d) those commercial teachers desiring advanced training.

The ground covered by the special subjects offered by this department is as follows: Stenography and Typewriting, two years; Convention and Court Reporting, one year; Secretarial Training, one year; and Methods of Teaching Commerce, one year.

Equipment. The Office Training department is well equipped with the latest appliances and fixtures, including the standard types of typewriters, duplicators, mimeographs, dictaphones, mimeoscope, and filing cabinets.

Each student is given access to equipment upon payment of a fee required for the course in which he is registered. All equipment and apparatus is kept in constant repair, and students are taught, under the direction of the instructors, how to keep the apparatus they use in proper order.

The following courses are offered:

400. Elementary Stenography. Gregg Shorthand. Theory of manual, first twelve lessons, covered thoroughly. Shorthand penmanship given special attention. Primary and Intermediate Certificates granted. Typing course 410 must be taken concurrently with this course, unless student has had an equivalent course.

Degree course, freshman year, and Vocational course, first year; either semester; 3 credits; 4 recitations. Texts: Gregg Shorthand Manual. Gregg Writer.

401. Elementary Stenography. A continuation of course 400. Theory of manual completed. Special attention given to phrase writing. Beginning dictation. Complete Theory Certificate granted. Typing course 411 must be taken concurrently with this course, unless student has had an equivalent course.

Degree course, freshman year, and Vocational course, first year; either semester; 3 credits; 4 recitations. Texts: Gregg Shorthand Manual. Gregg Speed Studies. Gregg Writer.

402. Advanced Stenography and Typewriting. Dictation covering vocabularies of representative businesses, such as real estate, law and collections, banking and finance, life and fraternal insurance, publishing, railway, manufacturing, and a drill in matter qualifying one to pass the United States Civil Service examination.

The typewriting periods will be utilized in transcribing matter which has been taken in dictation. The use of the dictaphone will be introduced as an aid to increasing speed both in stenography and typewriting. 80-, 100-, and 120-word speed certificates granted.

Degree course, sophomore year, and Vocational course, second year; first semester; 3 credits; 3 recitations; 4 laboratory periods of one hour each. Fee \$2.00. Text: Eldridge Dictation Exercises. Gregg Writer.

403. Advanced Stenography and Typewriting. A continuation of course 402. Court and convention reporting introduced. Dictaphone and Mimeograph work.

Degree course, sophomore year, and Vocational course, second year; second semester; 3 credits; 3 recitations; 4 laboratory periods of one hour each. Fee \$2.00. Text: Eldridge Dictation Exercises. Gregg Writer.

404. Reporters' Course. Designed for those having finished course 403 and desiring to specialize in court or convention reporting.

Elective; senior year; second semester; 2 credits; 2 lectures; 2 laboratory periods of one hour each. Fee \$1.00. Text: Expert Shorthand Speed Course. Gregg Writer.

405. Reporters' Course. A continuation of course 404.

Elective; senior year; second semester; 2 credits; 2 lectures; 2 laboratory periods of one hour each. Fee \$1.00. Text: Gregg Reporter.

406. Elementary Civil Service Stenography. Designed for those who wish to take courses 400 and 401 in one semester, in order to prepare rapidly for civil service examination. Course will probably be discontinued after the war. Typing course 415 must be taken concurrently with this course, unless student has had the equivalent.

Elective; all courses; either semester; 6 credits; 7 recitations. Texts: Gregg Shorthand Manual. Gregg Speed Studies. Gregg Writer.

407. Advanced Civil Service Stenography and Typewriting. A continuation of course 406. Equivalent to courses 402 and 403 combined in one semester.

Elective; all courses; either semester; 6 credits; 6 recitations; 8 laboratory periods of one hour each. Fee \$3.00. Texts: Eldridge Dictation Exercises. Gregg Writer. McDaniel, Civil Service Course.

410. Elementary Typewriting. Rational Touch Typing. Theory and practice of touch typing, covering mastery of the alphabet and numerals. Finger gymnastics, rhythm drills, dictation exercises. Punctuation and mechanical arrangement of business correspondence.

Elective; all courses; either semester; 2 credits; 5 laboratory periods of one hour each. Fee \$2.00. Text: Rational Typewriting.

411. Elementary Typewriting. Continuation of course 410. Legal forms, tabulating, centering, manifolding, and speed practice. Special attention given to the mechanics of the typewriter. Speed certificates granted.

Elective; all courses; either semester; 2 credits; 5 laboratory periods of one hour each. Fee \$2.00. Text: Rational Typewriting.

412. Office Training and Management. Designed to give such knowledge and training as is called by employers "experience." Advanced typewriting, dictaphone, stencil and mimeograph work. Topics covered: attractive arrangement of business letters; applying for a position; office routine; inclosures, remittances, and banking; filing systems; office appliances; shipping information; business ethics; printing and proof reading; a day's work coordinated into an organized whole; office efficiency problems.

Prerequisite: Commerce 411, or equivalent; junior year; first semester; 3 credits; 2 lectures; 4 laboratory periods of one hour each. Required of all Stenography and Office Training students. Fee \$2.00.

413. Secretarial Training for Stenographers. Continuation of course 412. Actual service in the College administrative offices required. Topics covered: private secretary defined; learning the position; managing callers; handling correspondence; filing; outlines and reports; sources of information; editing and proof reading; appointments, diaries, and accounts; ethics; systematizing the office.

Junior year; second semester; 3 credits; 3 lectures; 3 laboratory periods of one hour each. Fee \$1.00.

414. Bibliography. Advanced library training for secretaries and others, in order that they may know where and how to find quickly all information regarding any important field of knowledge. Method of indexing books and general filing. Twelve lectures and problems will be given by experts in the various fields, covering the main principles, chief authorities, and the source of material.

Dewey Decimal Classification: 3 lectures and problems by the College Librarian. Subject Headings: 3 lectures and problems by the College Cataloguer. Elective; junior year; second semester; 1 credit; 1 lecture.

415. Elementary Civil Service Typewriting. Rational Touch Typing. Same as courses 410 and 411 combined in one semester. Designed for students taking shorthand course 406, and for those desiring to prepare for civil service examination in typing. Course will probably be discontinued after the war.

Elective; all courses; either semester; 4 credits; 10 laboratory periods of one hour each. Fee \$3.00. Text: Rational Typewriting.

416. Expert Typists' Course. Designed to give expert finger training. Special emphasis on rapid tabulating, billing, and manifold. Speed and endurance drills. Certificates of proficiency and awards for speed and accuracy will be issued.

Prerequisite: Commerce 412. Either semester; 1 credit; 3 laboratory periods of one hour each. Fee \$1.00. Text: Rational Typewriting.

417. Expert Typists' Course. Continuation of course 416. Artistic typewriting based upon the following points: even touch, absolute accuracy, and judicious display. Endurance speed tests.

Prerequisite: Commerce 416. Elective; either semester; 1 credit; 3 laboratory periods of one hour each. Fee \$1.00. Text: Rational Typewriting.

SCHOOL OF ENGINEERING AND MECHANIC ARTS

GRANT ADELBERT COVELL, Dean

The School of Engineering offers courses leading to the advanced professional degrees, the degree of Bachelor of Science, and the vocational certificate in Mechanic Arts.

Advanced Degrees. The professional degree of Civil Engineer, Electrical Engineer, or Mechanical Engineer, is offered to graduates of this College, or other colleges of equal rank, who have attained the degree of Bachelor of Science in the corresponding engineering course, and met the further requirements for graduate study laid down on pages 74-75 of this catalogue. These requirements specify one full year of resident work amounting to 32 college credits, including an acceptable thesis.

Baccalaureate Degrees. Four-years courses leading to the degree of Bachelor of Science are offered in the School of Engineering as follows:

A course in Civil Engineering, with majors in Highway Engineering, Irrigation Engineering, and Structural Engineering.

A course in Electrical Engineering.

A course in Industrial Arts.

A course in Mechanical Engineering.

Vocational Course. A three-years vocational course in Mechanic Arts is also offered. While this course does not lead to a degree, a certificate or diploma will be awarded to those students who complete it.

The Requirement for Graduation in each of the four degree courses offered in the School of Engineering is 136 college credits. These credits are mostly in the form of required subjects in the individual courses, but they may be classified in groups as follows:

GROUP	Civil Eng.	Elec. Eng.	Indus. Arts	Mech. Eng.
Professional Group	80	72	51	66
Pure Mathematics	19	18	3	18
General Science	14	18	12	14
Shop Work		8	16	13
General Subjects, including electives..	13	10	44	15
Military Science	2	2	2	2
Military Drill	6	6	6	6
Gymnasium	2	2	2	2
	136	136	136	136

It is expected that the student will closely follow the outline of the course specified in the department in which he is registered.

CIVIL, HIGHWAY, AND IRRIGATION ENGINEERING

EXECUTIVE COMMITTEE

GORDON VERNON SKELTON, Chairman
Professor of Highway Engineering
THOMAS ANDERSON HENDRICKS TEETER,
Professor of Irrigation Engineering and Hydraulics
CONDE BALCOM McCULLOUGH,
Professor of Civil Engineering

Since the Board of Higher Curricula has restored the degree course in Civil Engineering to the College, it seems best to discontinue the degree of Bachelor of Science in Highway Engineering, and in Irrigation Engineering. Hereafter students who have met all of the requirements for graduation in either of these courses will receive the degree of Bachelor of Science in Civil Engineering also naming the major subject, as B. S. in Civil Engineering, majoring in Highway Engineering, etc. The work of this entire division of Civil Engineering is organized under three department heads, each responsible for the administration of his particular department.

The Executive Committee composed of the three heads of departments, decides matters of general policy, secures coordination, and promotes general efficiency.

Equipment. In addition to joint use with the other engineering departments of the testing laboratories described elsewhere, this division has a suite of well-lighted rooms, suitably arranged on the second floor of Mechanical Hall. This suite includes offices, recitation, and lecture rooms; an instrument room, and draughting and designing rooms, together with a well-equipped blue-print room with a cylindrical electrical blue-print machine, sun frames, and washing pans.

The draughting and designing rooms are well lighted and fully equipped with thoroughly modern and convenient drawing tables, supplied with individual lockers for instruments and other apparatus. The instrument room is conveniently arranged, having an individual glass-front case for each instrument and its accompanying equipment, which includes marking pins, tape, range-poles, notebook, etc. The instrument equipment includes the following: twelve transits, four of which are provided with solar attachment; nine levels, four plane-tables, one compass and two current meters, all high-class instruments of various standard makes and styles; a sufficient supply of level and stadia rods, range-poles, tapes, chains, plain and prismatic compasses, aneroid barometers, clinometers, planimeters, plumb-bobs, hand levels, etc., together with a well-selected assortment of specifications and blue-print plans of engineering structures for illustrative purposes.

CIVIL ENGINEERING

CONDE BALCOM McCULLOUGH, Professor
SAMUEL MICHAEL PATRICK DOLAN, Assistant Professor
DEXTER RALPH SMITH, Instructor

The purpose of the course in Civil Engineering is to give the student thorough theoretical instruction, accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, and Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department. The student has the opportunity, during the senior year, to select his work along lines that he is most interested in.

Recognizing the value of drawing to the professional engineer, not only as a means of expressing his ideas and of carrying out his plans, but also as a means by which the young graduate may enter some of the most desirable positions, the department lays special emphasis upon this subject. Much drawing is also required in connection with the preparation of plans and working drawings, as part of the office work of the higher technical courses.

The work in Surveying begins with the freshman year and continues through the sophomore year, with from six to nine hours of field practice a week. The student serves in subordinate positions at first, and gradually advances as a knowledge of the instruments is acquired. After having served his term as an apprentice, he is placed in charge of field parties and is held responsible for the results accomplished. During the freshman year he is given practice in land surveying and leveling, and during the sophomore year in topographic and railroad surveying. At all times, conscientious attention to duty, accuracy, and speed will be demanded. Every student keeps full and accurate notes of all work done in the field. These, after being criticised, are transcribed and filed with the instructor.

In addition to the specified required work a number of technical lectures will be given to freshmen by members of the engineering faculty. The purpose of these lectures is to acquaint the entering class with the general scope and purpose of the work which they have chosen as a profession.

DEGREE COURSE IN CIVIL, HIGHWAY, AND
IRRIGATION ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Spherical Trigonometry (Math. 15).....	1	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100, 101).....	3	3
Mechanical Drawing (C. E. 107).....	3	
Engineering Drawing (C. E. 111).....		3
Descriptive Geometry (M. E. 152).....	3	
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 10).....	$\frac{1}{2}$	
Plane Surveying (C. E. 222).....		5
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2).....	1	1
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Sophomore Year

Differential Calculus, Integral Calculus (Math. 51, 52)....	4	4
Engineering Physics (Phys. 101, 102).....	4	4
Topographic Surveying (C. E. 223).....	5	
Railroad and Canal Surveying (C. E. 272).....		5
Gymnasium (Phys. Ed 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 3, 4).....	1	1
Electives (Restricted)	3	3
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year *		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
* Roads and Pavements (H. E. 405).....	3	
Graphic Statics (C. E. 511).....	2	
Hydraulics (I. E. 102).....		3
Cement and Highway Laboratory (Exp. E. 231).....	2	
* Structural Materials Laboratory (Exp. E. 232).....		3
Military Science (Theo. Inst. 1, 2).....	1	1
Masonry and Foundations (C. E. 552).....		3
Drill (Military 5, 6).....	1	1
** Electives (Restricted)	3	3
	17	17

* Irrigation students in the junior year will take Irrigation Farming (Drainage and Irr. 3) instead of Roads and Pavements; and Soil Physics (Soils 5) instead of Structural Materials Laboratory.

** Approved Electives: English, Modern Language, Economics, National Government, State and Municipal Government, Geology, Differential Equations, Least Squares.

Senior Year

Engineering Seminar (C. E. 605, 606).....	1	1
Roofs and Bridges (C. E. 513, 514).....	4	4
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (H. E. 607).....		2
Municipal Water Supply (I. E. 305).....	3	
Sanitary Engineering (I. E. 702).....		3
Engineering Electives	5	6
	16	16

Senior Year

Structural Option

Roofs and Bridges (C. E. 513, 514).....	4	4
Engineering Seminar (C. E. 605, 606).....	1	1
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (C. E. 607).....		2
Advanced Structural Engineering (C. E. 515, 516).....	3	3
Design of Highway Structures (H. E. 415).....	2	
Advanced Materials Laboratory (Exp. E. 235).....		2
Engineering Electives	3	4

The following courses are offered:

107. Mechanical Drawing. The use of instruments and the elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, geometric constructions, principles of orthographic projection, shading, and finally, the complete development of a working blue print of some simple device from sketches. Particular attention is given to free-hand lettering, general neatness, and accuracy.

Civil, Highway, Irrigation, and Mining Engineering; first semester; 3 credits; 3 laboratory periods. Fee \$0.50. Text: French, Engineering Drawing.

111. Engineering Drawing. A continuation and extension of the previous work in drawing, with special reference to application in Highway and Irrigation Engineering. Practice in tracing and in blue and black line process printing will be given.

Prerequisite: C. E. 107. The course in Civil, Highway, and Irrigation Engineering; freshman year; second semester; 3 credits; 3 laboratory periods. Fee \$0.50. Text: French, Engineering Drawing.

222. Plane Surveying. This course includes recitations, lectures, field and office work in the theory and practice of plane surveying. The theory and construction of the different surveying instruments are studied, and practice will be given in making their tests and adjustments. The United States public land surveys and land laws are studied. Forms of field notes, methods of balancing and plotting surveys, computing areas and like work, will have due consideration. Proper emphasis will be placed upon chain surveying. Surveys will be made of assigned plots, and descriptions prepared. Resurveys will be made where more than ordinary difficulty is encountered in the interpretation of the descriptions and existing evidence.

Prerequisite: Math. 11 and C. E. 107. The courses in Civil, Highway, and Irrigation Engineering, and Landscape Gardening; freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

223. Topographic Surveying. This course will include the execution of a complete topographic survey of an assigned tract, including the base line measurement, transit, stadia, and plane table work, plotting, and finishing the map.

Prerequisites: C. E. 222 and 107. The courses in Civil, Highway, and Irrigation Engineering, and Landscape Gardening; sophomore year; first semester; 5 credits; 1 recitation; 4 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

225. City Surveying. (Elective.) A study of the necessary precision; a survey of a portion of the city; also a new addition, including the preparation of plots, establishment of grades, etc.; survey and office work for preparation of plans for street improvement; preparation of estimates, etc.

Senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

232. Plane Surveying. In this course substantially the same ground will be covered as in course 222, except that there will be but two-thirds as much field practice.

Prerequisites: Math. 11, 21, 31, and Mechanical Drawing. The courses in Mining; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

234. Plane Surveying. An abridgment of course 222 designed to meet the requirements of students in Forestry and Logging Engineering. As much time as possible will be given to the study and use of the type of instruments used in the Forestry service. Some time will be given to the retracing of lines from original descriptions and field notes and to different methods of determining the meridian.

Prerequisites: Math. 11, and Mech. Draw. The courses in Forestry and Logging Engineering; freshman year; second semester; three credits; one recitation; 2 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

235. Topographic Surveying. A condensation of course 223. This course is designed for students in Forestry and Logging Engineering.

Prerequisite: C. E. 232 or 222. The courses in Forestry and Logging Engineering; sophomore year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

242. Farm Surveying and Leveling. This course is designed for Agricultural students, and consists of problems of chaining, elementary transit work, and in leveling. Most emphasis will be put upon leveling and its application to drainage and general irri-

gation work. Problems will be given in profile and contour work as applied to farm drainage, road construction, and irrigation.

Agricultural course; freshman year; first semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.00. Text: Pence and Ketchum, Surveyor's Manual.

243. Topographic Surveying. This course is designed especially for those taking the Irrigation Farming course, and is an enlargement on C. E. 242. A complete topographic survey and map of an assigned area will be made. Special emphasis will be put on the study of the relation of surface topography to methods of water distribution, drainage, etc., all illustrated by an assigned survey and map. Methods of locating ditches and of making estimates on grading for the same will be studied from the contour map.

Prerequisite: C. E. 242. Irrigation Farming course; junior year; first semester; 2 credits; 2 laboratory periods with assigned lectures where required. Fee \$1.00. Text: Breed and Hosmer, Plane Surveying.

252. Precise Surveying and Geodesy. A study of the precise methods of surveying and leveling, base line measurements, precise triangulation, determination of true meridian and latitude.

Prerequisite: C. E. 222, 223, 272. Elective; senior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00.

254. Plane Surveying. A brief course in surveying for those who do not find time to take C. E. 222, 232, or 234. Lectures, field and office practice in the care and use of surveying instruments. Transit and traverse work. Leveling and topography.

The course in Electrical Engineering; junior year; second semester; 2 credits; 2 laboratory periods. Fee \$1.00.

256. Plane Surveying. This course includes recitations, lectures, field and office work in the theory and practice of plane surveying. The theory and construction of the different instruments. Tests and adjustments of instruments. Transit and traverse work. Leveling and topography. Computation of earthwork. Computation of reservoirs, etc..

Elective; junior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00.

272. Railroad and Canal Surveying. This course will include a study of the simple, compound, transition, and vertical curves, and of earthwork. Students will solve many problems both in the class room and in the field, and will make a survey of a canal, highway, or

railroad, including a reconnaissance, preliminary survey, location survey, and estimates of earthwork. Emphasis will be placed on yardage estimates, cross-sectioning and earthwork computations, and details of construction.

Prerequisites: C. E. 222 and 223. Civil, Highway, and Irrigation Engineering, and Landscape Gardening; sophomore year; second semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$1.00. Text: Allen, Railroad Curves and Earthwork.

274. Railroad Surveying. This course is designed especially for the Logging Engineering course, and takes up the survey of a railroad line through rough wooded country, including a reconnaissance, preliminary, and location surveys of such a line. A complete estimate of the yardage, and also of the cost of the road is made. The course also includes the study of the simple, compound, vertical, and transition curves.

Prerequisites: C. E. 223 or 233. Course in Logging Engineering; sophomore year; second semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each. Fee \$1.00. Text: Allen, Railroad Curves and Earthwork.

281. Railway Engineering. Study of the methods of railway construction and maintenance, standard structures, trestles, tunnels, culverts, minor bridges, ballast, rails and rail supports and fastenings, yards and terminals. This course will be preceded by a brief review of the simple and compound curve and the railway spiral.

Prerequisite: C. E. 272. Elective; first semester; 3 credits; 2 recitations; 1 laboratory period. Text: Webb, Railway Construction.

282. Railway Engineering. Continuation of course 281.

Elective; second semester; 3 credits; 2 recitations; 1 laboratory period. Text: Webb, Railway Construction.

511. Graphic Statics. A study of graphic analysis as applied to the determination of stresses in cranes, derricks, roof and bridge trusses, and similar problems. A study is also made of the more recent methods of graphical analysis as applied to the evaluation of four dimensional expressions.

The courses in Civil, Highway, and Irrigation Engineering; first semester; 2 credits; one recitation and one three-hours laboratory period. Fee \$0.50.

513. Roofs and Bridges. A study of stress analysis and design as applied to simply supported structures, including the prepara-

tion of stress diagrams, general detail drawings, shop drawings, and material bills. Trusses of the Pratt, Howe, Warren, and similar types, curved chord and subpaneled trusses, plate girder, and beam spans will be treated in this course.

Prerequisites: M. E. 251, 252. Senior year; first semester; 4 credits; 2 recitations; 2 laboratory periods of three hours each. Fee \$1.00. Text: Kirkham, Structural Engineering.

514. Roofs and Bridges. A continuation of course 513. Advanced work in highway bridge design including a treatment of "higher bridge structures." Draw spans, continuous girder and truss spans, cantilever, suspension, and arch spans of the various types are treated in this course.

Senior year; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$1.00. Text: Johnson, Bryan, and Turneaure, Modern Framed Structures, Part II.

515. Structural Engineering. Advanced draughting room work including the preparation of detail drawings, shop drawings, material bills, etc. Preparation of itemized estimates and analysis of cost will be treated in this connection. Plans and working drawings will be prepared for roof trusses, girder spans, pin-connected and riveted bridge trusses and similar construction.

Senior year; first semester; 3 credits; 3 laboratory periods. Fee \$1.00.

516. Structural Engineering. Continuation of course 515. Draughting room and class room treatment of advanced work in structural design, including a study of the theories of internal work, secondary stress calculation and allied problems, together with a discussion of the more recently developed methods for the solution of indeterminate structures.

Senior year; second semester; 3 credits; 3 laboratory periods. Fee \$1.00.

552. Masonry and Foundations. A study of the properties of stone, brick, lime, cement, mortars, and concretes, and methods of their adaptation for use in foundations, retaining walls, piers, dams, and similar construction. Recitations, lectures, and work in the draughting and computing room.

The courses in Civil, Highway, and Irrigation Engineering; junior year; second semester; 3 credits; 3 recitations.

557. Reinforced Concrete. A study of the fundamental principles of reinforced concrete design as applied to beams, girders, columns, walls, and arches. Designs for the beam, girder, and arch

types in bridge construction; also typical retaining wall and irrigation structures are worked out in the draughting room and detailed drawings made of the same. This course also includes the investigation of the elastic arch together with a study of the use of influence diagrams in arch analysis.

The courses in Civil, Highway, and Irrigation Engineering; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Text: Turneure and Maurer, Principles of Reinforced Concrete.

605. Engineering Seminar. The members of the senior class in the courses of Civil, Highway, and Irrigation Engineering, and the professors and instructors, constitute the Engineering Seminar, which meets once a week. The purpose of this seminar is to bring the student in touch with engineering literature and practice. To this end, a number of journal reviews and papers on engineering subjects will be presented and freely criticised each week. The work will follow a previously arranged program.

Senior year; first semester; 1 credit.

606. Engineering Seminar. See course 605.

Senior year; second semester; 1 credit.

621. Military Surveying and Mapping. This course is designed to give elementary instruction in the art of making military maps, surveys, and reconnaissance. The work consists of a series of lectures, amplified by work in the field. Instruction is given in the use of the military sketching case and clinometer, in the construction of topographical maps, road sketches, free-hand perspective, etc.

Offered both first and second semester to all students registering for special military work. One credit; 2 hours laboratory and field work each week as arranged. Fee \$1.00.

622. Military Structures. A study of the methods used in the construction of the simpler military structures, including revetments, brush work, obstacles, and the simpler military bridges. The course includes instruction in knot tying, rope lashings, and in the handling of heavy weights by means of shear poles, derricks, etc.; the construction of military obstacles and the weaving of brush work revetments are also included. A series of lectures amplified by actual work in the field.

Offered both first and second semesters to all students registering for special military work. One credit; 2 hours laboratory and field work each week as arranged. Fee \$1.00. Text: Engineer Field Manual, Leach.

.HIGHWAY ENGINEERING

GORDON VERNON SKELTON, Professor

There are few lines of public endeavor where more money is being spent, or where a higher degree of technical skill and training is required, than in the field of highway engineering. The purpose of this course is to meet the demand in this State and throughout the Northwest for men equipped to take charge of road and city street construction and maintenance work. Aside from the opportunity for useful and honorable service, no field, it is believed, offers greater encouragement in a financial way to the young man of ambition and ability.

Thorough theoretical instruction is accompanied by as much laboratory and field practice as possible. The course includes such basic studies as Mathematics, Chemistry, Physics, Drawing, Materials of Engineering, Applied Mechanics, and Hydraulics, in addition to the technical work given by this department.

The department of Experimental Engineering is equipped with complete and thoroughly up-to-date testing laboratories, including the very latest and best cement- and highway-testing machinery, thus affording students in Highway Engineering the opportunity of studying by direct observation and experiment the strength and properties of the various engineering materials.

In the study of highways, special reference is made to the conditions and needs of Oregon. Due consideration is given to the construction and maintenance of dirt, gravel, and broken-stone roads as well as to the higher types. In consequence of the vast area of the State, this class of roads must, of necessity, constitute the greater part of its highways for many years.

DEGREE COURSE IN HIGHWAY ENGINEERING

The prescribed courses of the freshman, sophomore, and junior years in Highway, Civil, and Irrigation Engineering are identical.

	Senior Year	Semester	
		1st	2nd
Roofs and Bridges (C. E. 513, 514).....		4	4
Engineering Seminar (C. E. 605, 606).....		1	1
Reinforced Concrete (C. E. 557).....		3	
Contracts and Specifications (H. E. 607).....			2
Highway Engineering (H. E. 407, 408).....		4	4
Economics of Highway Construction (H. E. 410).....			2
Advanced Highway Laboratory (Exp. E. 233).....		2	
Engineering Electives		2	3
		16	16

The following courses are offered:

405. Roads and Pavements. A study of the fundamental principles of location, construction, and maintenance of roads, as well as a thorough study of the materials used in road and street building. Asphalt, brick, wood block, stone, concrete, and other forms of street pavements are carefully studied. This course is given in connection with a laboratory course, Exp. E. 131.

The courses in Civil, Highway, and Irrigation Engineering, and Landscape Gardening; junior year; first semester; 3 credits; 3 recitations.

407. Highway Engineering. Economic grades and proper location for different soils and surfacing materials. Surface and sub-surface drainage. Culvert design and construction. Construction and maintenance of earth, sand-clay, gravel, macadam, concrete, brick, and other types of roads. Dust preventives and road binders. Preliminary surveys and estimates. Specifications.

Senior year; first semester; 4 credits; 3 lectures; 1 laboratory period.

408. Highway Engineering. Continuation of course 407.

Senior year; second semester; 4 credits; 2 lectures; 2 laboratory periods.

410. Economics of Highway Construction. Economic and social advantages of improved roads. The traffic census. Local and centralized systems of control. Highway laws of different states. Organization of construction and engineering forces. Cost

data. Methods of handling work. Forms of contract — lump sum, unit price, percentage and cost plus fixed sum.

Senior year; second semester; 2 credits; 2 recitations.

415. Design of Highway Structures. A draughting room course in the design of the various structures required in highway work. The various culvert types, short-span beam bridges, tunnels, retaining walls and similar construction, including a consideration of methods for preliminary waterway engineering, selection of type, and allied questions.

Elective; senior year; 2 credits; 2 laboratory periods. Fee \$1.00.

607. Contracts and Specifications. A study of the general principles and laws of contracts as applied to engineering, including the preparation and study of specifications and contracts based upon engineering structures designed by the individual student.

Senior year; second semester; 2 credits; 2 recitations.

GRADUATE COURSE IN HIGHWAY ENGINEERING

From Thursday, January 2, 1919, to end of first semester.

This short course in Highway Engineering is given by the department of Highway Engineering in cooperation with the departments of Civil, Experimental, and Irrigation Engineering and is intended for graduate engineers who wish to specialize in some line of highway work, or for others properly prepared. The purpose of the course is to review the principles and current practice of Highway Engineering.

The various courses are complete in themselves and any one course may be taken without the others if the applicant's preparation is suitable for that course.

Instruction will be given by means of lectures, assigned reading, and laboratory practice. Special lectures by non-resident engineers will be provided where possible. No classes will be formed unless a sufficient number of students apply. During the year 1918 classes will not be arranged for more than 16 credit hours a week.

Those intending to take the course should write Professor Skelton in advance.

The following courses are offered:

Road Design. Two times a week.

Construction of Roads. Three times a week.

Highway Bridges. Three times a week.

Cement and Highway Laboratory. Three laboratory periods a week.

Street Design and Construction. Three times a week.

Reinforced Concrete Highway Structures. Three times a week.

Contracts and Specifications. Two times a week.

The Hydraulics of Highway Drainage and Construction. One laboratory period a week.

IRRIGATION ENGINEERING

THOMAS ANDERSON HENDRICKS TEETER, Professor

Successful agriculture in the arid parts of Oregon is based on the science of irrigation. The widespread development of irrigation lands in this and other states of the arid west, by means of both gravity supplies and pumping systems, has extended the necessary qualifications of the engineer to include a knowledge of irrigation methods, pumping, and power machinery. The province of the engineer, therefore, comprises the development, conservation, and economical use of limited water supplies. The failure of our irrigation projects is too frequently caused by the employment of incompetent engineers and managers. In recognition of the need, in the Pacific Northwest, for engineers trained in hydraulics, irrigation, and water power, the course in Irrigation Engineering has been established.

Realizing, however, that the young engineer is frequently obliged to take charge of work which properly falls outside of the field in which he has specialized, the course in Hydraulics and Irrigation Engineering is arranged to cover as broad a field as practicable, in order that the graduate may experience little difficulty in accommodating himself to the available positions. The curriculum in the freshman and sophomore years is the same as in the general civil engineering courses. It has for its purpose the laying of a foundation on which to build the more specialized technical work of the junior and senior years. The last two years are intended to equip the student with a well-rounded knowledge of hydraulics and irrigation engineering — a knowledge which will enable the student to hold a responsible position in reclamation and power work.

The work of this department is designed to furnish a thorough course of theoretical instruction accompanied by practice in the various lines of irrigation, drainage, water-supply, and water-power engineering. The course, moreover, is made practical by a large proportion of laboratory and field practice in conjunction with the theoretical work. Special stress is laid on the solution of problems, and experiments in the laboratory. Emphasis is laid on skill in handling surveying and water-measuring instruments. The student is taught how to make stream measurements; design, lay out, and construct dams, canals, headworks, diversion weirs, flumes, pipe lines, and distributing systems.

Inspection trips are conducted in the junior and senior years to afford the students an opportunity to familiarize themselves with actual engineering work.

Electives. Ample opportunity is given the student to elect courses outside of the School of Engineering. This provision is made that the student may be encouraged to study Business Management, Economics, Political Science, Accounting, English, and Modern Languages, a knowledge of each of which is helpful, if not essential, in the engineering profession. In addition, the School of Agriculture offers to the student of irrigation engineering, special courses in irrigation farming, forage crops, climatology, farm drainage, and soil physics together with their relations to the growth of crops on irrigated lands.

Equipment. The excellent equipment of the Civil and Experimental departments, as described under these respective titles, is available for use by the students in Irrigation Engineering. Besides the draughting rooms and laboratories, the student has the use of transits, levels, plane-tables, current meters, and tapes, for practical work, as well as pumps, water meters, rams, and small water wheels of the Experimental Engineering laboratories for experimental work. Facilities for experiments with small weirs, orifices, and devices for measuring irrigation water are provided.

In addition to the above facilities, the proximity of the Willamette and Mary's rivers, Oak Creek, and the mill race of the Corvallis Flouring Mills, affords excellent opportunities for practice in stream gauging. For those students who desire to prepare themselves for positions as managers of irrigation projects, the courses in Drainage and Irrigation give access to the equipment of that department.

COURSE IN IRRIGATION ENGINEERING

The prescribed courses of the freshman and sophomore years of the courses in Irrigation, Civil, and Highway Engineering are identical.

	Semester	
	1st	2nd
Engineering Seminar (C. E. 605, 606).....	1	1
Reinforced Concrete (C. E. 557).....	3	
Contracts and Specifications (H. E. 607).....		2
Roofs and Bridges (C. E. 513).....	4	
Drainage Engineering (I. E. 502).....		3
Hydrology (I. E. 303).....	1	
Soil Surveying (Soils 13).....		3
Irrigation Engineering (I. E. 401).....	2	
Design of Irrigation Structures (I. E. 402).....		2
Hydraulics Laboratory (Exp. E. 262).....		2
Hydraulic Pumps and Motors (I. E. 201).....	2	
Electives (Approved)	3	3
	—	—
The following courses are offered:	16	16

101. Hydraulics. A practical application of the principles of hydraulics to irrigation farming, arranged especially for agricultural students. A study of the laws of water pressure in tanks, pipes, and flumes; the measurement of water by weirs, orifices, and current meters; the study of losses of head in pipes and the consequent effect on the discharge. The design of open channels; seepage losses; the operation of rams, pumps, and other lifting devices.

Elective for seniors in Agriculture; senior year; first semester; 2 credits; 2 lectures. This course can be taken only in conjunction with Experimental Engineering 265, a 1-credit laboratory course, covering the same field. Text: Merriman, Elements of Hydraulics.

102. Hydraulics. A technical course dealing with the elementary laws of liquids in motion and at rest; the weight and pressure of water on dams and gates, velocity and discharge through orifices, tubes, pipes, and flumes; stream-lines, fluid friction, losses of head; time of emptying reservoirs; and waterhammer.

Prerequisite: M. E. 251. Required of juniors in Civil, Highway, Irrigation, Electrical, and Mining Engineering; junior year; second semester; 3 credits; 3 lecture periods. Text: Daugherty, Elements of Hydraulics.

103. Hydraulics. A course similar in character to 102, dealing with the elements of hydraulics as applied to mechanical engineering. Students who have not completed Statics and Dynamics must register for M. E. 251 simultaneously with this course.

Prerequisites: Math. 52. Required of juniors in Mechanical Engineering; junior year; first semester; 2 credits; 2 recitations a week. Text: Daugherty, Elements of Hydraulics.

201. Hydraulic Pumps and Motors. The application of the principles of hydraulics to the design, construction, and operation of pumps and water wheels; the various forms of wheels and pumps, their adaptability, and efficiency.

Prerequisite: Hydraulics, I. E. 102. Required of seniors in Irrigation Engineering; elective for all other seniors in Engineering; senior year; first semester; 2 credits; 2 lecture periods. Texts: Daugherty, Hydraulic Turbines. Daugherty, Centrifugal Pumps.

203. Hydraulic Pumps and Motors. A study of the design, construction, and operating characteristics, and cost of hydraulic power and pumping machinery, together with the proper use and selection thereof.

Prerequisite: Hydraulics, I. E. 102 or 103. Elective for students in engineering courses who have completed Elementary Hydraulics; first semester; 3 credits; 3 lecture periods. Texts: Daugherty, Hydraulic Turbines. Daugherty, Centrifugal Pumps.

204. Water Power. A general study of the development of water power on streams; the effect of pondage, storage, and load factor on the capacity and efficiency of the plant and equipment; a detailed study of the characteristics of modern water turbines, together with an investigation of the speed regulation and manner of governing large plants. Practical problems in the design of plants will constitute a part of this course.

Prerequisite: Water Supply Engineering, I. E. 305 or Irrigation Engineering, I. E. 401. Elective for seniors or graduates in Engineering courses; senior year; second semester; 3 credits; 3 lecture periods. Fee \$1.00. Text: Meade, Water Power Engineering.

303. Hydrology. A recitation and problem course dealing with the character of drainage basins; relations between rainfall and runoff; estimating flow from watersheds; variations in seasonal discharges, a study of current meters, and other instruments and methods for determining stream flow; the hydrograph and its

use; the duration curve; the ripple curves and their relations to power and storage studies.

Prerequisite: I. E. 101 or 103. Required of seniors in Irrigation Engineering; elective for other Engineering students and Agricultural students; senior year; first semester; 1 credit; 1 recitation. Text: Hoyt and Grover, River Discharge. Fee \$1.00.

305. Municipal Water Supply. Preliminary investigations for determining the available supply of water for irrigation and domestic purposes; the use of the mass diagram in the study of storage; ground water resources; the source of water supplies; manner of conveying and storing water; requirements for fire protection; the economics of pumping and the proper installation of pumping plants. The solution of numerical problems is required of the student.

Prerequisites C. E. 511, I. E. 102. Elective for seniors in Engineering; senior year; first semester; 3 credits; 2 lecture periods; 1 laboratory period. Fee \$1.00. Text: Turneure and Russell, Water Supply Engineering.

401. Irrigation Engineering. Investigations and surveys; the operation and maintenance of large irrigation projects from the engineer's point of view; precipitation, run-off, underground flow, fluctuation of stream flow; storage; methods of determining losses due to evaporation and seepage; canal linings; the phenomena of water logging and alkali deposits; drainage; the duty of water; irrigation by pumps; the location and construction of irrigation systems; diversion weirs, headgates, flumes and drops; the theory and practice of water measurements, water records, methods practiced in other countries.

Prerequisite: I. E. 102. Required of seniors in Irrigation Engineering; senior year; first semester; 2 credits; 2 lecture periods. Text: Etcheverry, Conveyance of Water, Vol. II.

402. Irrigation Construction. This course deals with the storage and conveyance of water; the design of headworks and flumes; the selection of dam sites; investigations of the stability of dams in use; the design of a dam by Wegman's method; the design of pipe lines, earthen dams, and reservoirs; the design of flash boards and movable dams, hollow dams, and their application to storage and pondage. This course consists entirely of numerical problems with occasional lectures on the solution of the same.

Prerequisites: C. E. 511, I. E. 401, and I. E. 102. Required of seniors in Irrigation Engineering; senior year; second semester;

2 credits; 2 three-hour laboratory periods. Fee \$1.00. Text: Etcheverry, Irrigation Structures, Vol. III.

502. Drainage Engineering. Surveys for, and design of, large drainage systems; the study of run-off and drainage coefficients; open ditch construction, dredging, and cleaning of large drainage channels; methods of computing sizes of tile drains; plans, reports, and records; estimates of costs; preparation and enforcement of specifications; division of costs; inspection of drain tile.

Prerequisite: I. E. 102. Required of seniors in Irrigation Engineering; senior year; second semester; 3 credits; 2 lectures and 1 laboratory period. Fee \$1.00. Text: Parsons, Drainage Engineering.

602. Water Law. A study of riparian rights; the early development of the water laws of the arid regions; doctrine of appropriation; beneficial use; comparison of California and Colorado doctrines; rights of appropriations; law of storage and diversion; rights of way; relation of water law and land law; relation of water to land appurtenant; prescription; abandonment; federal water laws; state control; water laws of Oregon; adjudication; irrigation and drainage district law; duties of state engineer; a brief comparison of Canadian and foreign water laws.

Elective for seniors in Irrigation Engineering. Text: Davis, The Law of Irrigation.

702. Sanitary Engineering. Drainage systems of populous districts, including chemical and bacterial purification of sewerage; collection and disposal of garbage; street cleaning; separate and combined water carriage systems; surveys, plans, and specifications; law of flow and determination of size and capacity; brick, terracotta, cement, and concrete sewers.

Elective for seniors in Civil Engineering. Prerequisite: I. E. 102. Senior year; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00. Text: Merriman, Elements of Sanitary Engineering.

802. Hydrography and Navigation. This consists of a brief study of the figure of the earth and the celestial sphere, followed by methods of determining latitude, longitude, time, and azimuth from the sun and stars; the location of soundings, maritime charting and mapping; and the fundamentals of navigation. Numerical problems are assigned to supplement the field work.

Prerequisites: C. E. 222, 223, and Spherical Trigonometry. Elective for juniors and seniors; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.00.

ELECTRICAL ENGINEERING

RICHARD HAROLD DEARBORN, Professor
LAWRENCE FISHER WOOSTER, Assistant Professor
* WILLIS DHU AINE PEASLEE, Instructor
JOHN HOOPER, Instructor

Since the advent of steam as a motive power, it is probable that no agency has so deeply affected the course of history and the intimate life of a large proportion of the human race as has the electric current, whether used in the transmission of intelligence, to furnish light, or to provide power for transportation and the industries.

Already the electrical industries are counted among the greatest in the world; their employees number more than a hundred thousand in the United States alone; their business in this country doubles every five years; and their field is ever expanding.

Notwithstanding this fact, most of the business is controlled by comparatively few corporations. The competition for desirable positions is therefore keen; and since the field in Electrical Engineering for the independent engineer is limited, only men of exceptional ability and energy attain the higher and more desirable positions.

Accordingly, no man is advised to take Electrical Engineering who does not consider himself, by taste and ability, exceptionally fitted therefor.

The College course is designed especially to train the young engineer in the theory of his profession, such practical work as is given in shop and laboratory being subordinated to this end. Practical acquaintance with actual conditions can be acquired only in the field, during vacation and after graduation. For this reason, and in order to supplement his college education, the student is urged to spend at least a part of his vacation in some line of electrical industry.

Starting with the foundation subjects of mathematics, science, drawing and shopwork, the student proceeds through the study of form expression in descriptive geometry, mechanism, the laws of mechanics, strength of materials, stress in structures and machinery; through the study of electricity and its application to machinery; the characteristic performance of electrical apparatus, its design and operation; through the study of thermodynamics as

* On leave of absence for war service.

applied to various types of heat engines, and finally to the complete power system involving the steam or hydro-electric power plant and the systems for transmitting and distributing electrical energy.

Equipment. The laboratory of this department occupies a large part of the west half of the first floor of Mechanical Hall, and is divided into several rooms, one for high-voltage testing, one for instruments, and another for supplies. Besides the equipment therein, including generators, motors, and other apparatus, the machinery in the College power plant and sub-station, is available for study and testing purposes. Three-phase electrical energy is supplied by the long-distance transmission line or by the local generating unit as desired.

In the laboratory is a $6\frac{1}{2} \times 15$ foot switchboard, consisting of three asbestos wood panels on which are mounted a number of voltmeters and ammeters for direct and alternating current; a power factor meter; a frequency meter, and synchroscope; a set of synchronizing lamps; circuit breakers; switches; and a large number of plug terminals, the leads of which extend to the four machine platforms; two slate panels with instruments and switches for direct-current machines; and two arc light regulating panels. Immediately adjacent thereto is a controller, auto-transformer and rheostat rack, six feet high by sixteen feet in length.

The machine platforms just mentioned are four feet wide by fourteen feet long, and have upon them the following equipment: one five, one seven-and-a-half, one ten, and one fifteen horsepower, three-phase, induction motor; two five, two seven-and-one-half, two ten, and two twelve-and-one-half kilowatt, 125-volt direct-current generators; two seven-and-one-half kilowatt rotary converters for parallel operation and one two-kilowatt rotary converter; two two-and-one-half kilowatt induction motor generator sets; one two-and-one-half kilowatt synchronous motor generator set; three seven and-one-half kilowatt revolving field alternators with three additional rotors for parallel operation, and one seven-and-one-half kilowatt revolving field alternator, from all of which current of one-, two-, three-, four-, and six-phases may be taken; two five-arc light constant current, one ten-volt 1000-ampere welding, one five-kilowatt 15,000 volt wireless, three seven-and-one-half kilowatt, 2200-220-110-volt transformers with ten taps each in the secondary, giving nine different voltages from 24 to 220 volts, with 87 percent taps in both primary and secondary for transformation from three-

to two-phase or the reverse, three 110 to 440 volt, and a number of ordinary transformers and compensators.

In addition to these the department is particularly well equipped to handle high-voltage testing with one ten-kilowatt 110,000-volt transformer, and one 100-kilowatt 350,000-volt Thor-darsen transformer.

The instruments available comprise standard portable volt, ampere, and watt meters which are divided into two groups, one of which is used for routine laboratory work, the other reserved for thesis and other tests in which greater accuracy is desired. In addition to this equipment, the departments of Physics and Electrical Engineering maintain an instrument standardization laboratory equipped with two one-hundred ampere storage cells and a group of dry cells to furnish potentials up to one hundred and fifty volts. The precision instruments and apparatus consist of a Leeds and Northrup potentiometer with certified standard cells and a complete line of standard shunts from one one-thousandth to ten ohms, a Weston laboratory standard voltmeter with ranges of 1, 100, and 200 volts and Siemens and Halske laboratory standard ammeters with ranges from 2.5 to 50 amperes and a similar watt-meter with five and ten ampere range.

DEGREE COURSE IN ELECTRICAL ENGINEERING

Freshman Year	Semester	
	1st	2nd
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Elementary Analysis (Math. 31).....		5
General Physics (Phys. 1, 2).....	3	3
Mechanical Drawing (M. E. 151).....	2	
Descriptive Drawing (M. E. 152).....		3
Foundry (Ind. Arts 173).....		2
Patternmaking (Ind. Arts 131).....	2	
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....	$\frac{1}{2}$	
Modern English Prose (Eng. 81, 82) or Adv. German or Adv. French (Mod. Lang. 207, 208, or 107, 108)*....	3	3
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

* By special permission a student may elect beginning German or French, (Modern Language 201, 202, or 101, 102).

	Semester	
	1st	2nd
Sophomore Year		
Differential and Integral Calculus (Math. 51, 52).....	4	4
Electrical Physics (Physics 105).....	3	
Electrical Measurements (Phys 106).....		3
General Chemistry (Chem. 100, 101).....	3	3
Introduction to Electrical Engineering (E. E. 121, 122)....	1	1
Mechanical Drawing (M. E. 153).....	3	
Mechanism (M. E. 204).....		3
Blacksmithing (Ind. Arts 151).....	2	
Machine Shop (Ind. Arts 206).....		2
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Junior Year

Electrical Engineering (E. E. 101, 102).....	4	4
Electrical Engineering Laboratory (E. E. 201, 202).....	3	3
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Heat Engines and Boilers (M. E. 318).....	3	
Hydraulics (I. E. 102).....		3
Plane Surveying (C. E. 254).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/> 17	<hr/> 17

Senior Year

Electrical Engineering (E. E. 103, 104).....	4	3
Electrical Design (E. E. 105).....		1
Electrical Laboratory (E. E. 203).....	4	
Electric Railways (E. E. 309).....	2	
Illuminating Engineering (E. E. 316).....		2
Telephony and Telegraphy (E. E. 313).....		2
Radio Communication (E. E. 314).....		2
Applied Mechanics Laboratory (Exp. E. 205).....	3	
Power and Hydraulic Laboratory (Exp. E. 206).....		3
Optional	3	3
	<hr/> 16	<hr/> 16

Suggested Options	Semester	
	1st	2nd
Power Plant Design (M. E. 323).....		3
Concrete Laboratory (Exp. E. 241).....	2	
Public Service Regulation (E. E. 317).....	2	
Periodical Literature (E. E. 301).....	1	
Practical Public Speaking (Eng. 105).....	3	
Technical English (Eng. 141).....	2	
Central Stations (E. E. 318).....		2
Electrical Laboratory (E. E. 204).....		3
Electric Railways (E. E. 310).....		3
High Voltage Engineering (E. E. 308).....		2
Thesis (E. E. 306).....		2
Seminar (E. E. 302).....		1

The following courses are offered:

101. Electrical Engineering. Study of the sine wave and periodic alternating quantity; harmonic analysis; laws governing the flow of current and energy; the magnetic and electrostatic circuit, production of rotating field by means of polyphase alternating currents in a distributed winding; losses in electric circuits; elementary theory of transmission lines.

Course 101 must be taken concurrently with 201, and 102 concurrently with 202. Electrical Engineering; junior year; first semester; 4 credits; 4 recitations. Text: Wilson, Electrical Engineering.

102. Electrical Engineering. Continuation of course 101.

Electrical Engineering; junior year; second semester; 4 credits; 4 recitations. Text: Wilson, Electrical Engineering.

103. Electrical Engineering. A study of the equipment of power plants, transmission lines, and distributing systems, and of the technical and economic problems connected with the generation, transmission, and distribution of electrical energy.

In connection with this course, inspection trips are made to the properties of various power companies. The expense of these trips will approximate twenty dollars, and should be anticipated by every Electrical Engineering student in his senior year.

Prerequisites: E. E. 101, 102, 201, 202. Electrical Engineering; senior year; first semester; 4 credits; 4 lectures.

104. Electrical Engineering. A continuation of course 103.

Electrical Engineering; senior year; second semester; 3 credits; 3 lectures.

105. Electrical Design. The design of transmission lines and distribution systems, both overhead and underground, with particular attention to costs.

Electrical Engineering; senior year; second semester; 1 credit; 1 lecture.

121. Introduction to Electrical Engineering. A general survey of the field of electrical engineering and the applications of electricity.

Electrical Engineering; sophomore year; first semester; 1 credit; 1 recitation. Text: Norris, An introduction to the Study of Electrical Engineering.

122. Introduction to Electrical Engineering. A continuation of course 121.

Electrical Engineering; sophomore year; second semester; 1 credit; 1 recitation. Text: Norris, An introduction to the Study of Electrical Engineering.

201. Electrical Engineering Laboratory. Study of electrical instruments; wave form and polarity of alternating currents; current, electromotive force and power relations in circuits involving resistance, inductance, and capacity; principles of operation of direct current dynamos and motors.

Must be taken concurrently with course 101.

Electrical Engineering; junior year; first semester; 3 credits; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Karapetoff, Experimental Electrical Engineering.

202. Electrical Engineering Laboratory. Continuation of course 201. Study of hysteresis and eddy current losses in magnetic circuits, electromotive force and energy losses in electrical circuits; the separation of losses in direct current machinery; efficiency and loading tests of direct and alternating current machinery; properties of insulating materials.

Must be taken concurrently with course 102.

Electrical Engineering; junior year; second semester; 3 credits; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Karapetoff, Experimental Electrical Engineering.

203. Electrical Engineering Laboratory. Characteristic performance of alternating current machinery, including alternator,

synchronous and induction motor, synchronous converter and static transformer with parallel operation and pump back tests.

Prerequisites: E. E. 101, 102, 201, 202. Electrical Engineering; senior year; first semester; 4 credits; 1 lecture; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Karapetoff, Experimental Electrical Engineering.

204. Electrical Engineering Laboratory. Complete engineering and commercial tests on standard electrical machinery, including standard acceptance tests on machines and plants, and special tests for engineering information. Tests will be run on outside plants under commercial operating conditions.

Prerequisite: E. E. 203. Electrical Engineering; senior year; second semester; 3 credits; 1 laboratory period. Fee \$2.50. Deposit \$3.00.

301. Study of Current Periodical Literature. Presentation of abstracts and discussion of current articles in electrical periodicals.

Electrical Engineering; senior year; first semester; 1 credit; 1 recitation. Text: Current Periodicals.

302. Seminar. A continuation of course 301 with a more complete analysis and discussion of recent developments.

Electrical Engineering; senior year; second semester; 1 credit; 1 recitation. Text: Current Periodicals.

306. Thesis. Elective, by permission, to seniors in Electrical Engineering. Only those whose past record indicates ability successfully to complete a satisfactory thesis, will be permitted to make this election.

Electrical Engineering; senior year; second semester; 2 credits.

308. High Voltage Engineering. A study and experimental investigation of high voltage and high frequency phenomena.

Electrical Engineering; senior year; second semester; 2 credits; 2 recitations. Text: Peck, Dielectric Phenomena in High Voltage Engineering.

309. Electric Railways. A general study of the application of electricity to street and interurban railways, covering traffic conditions, speed time curves, and rolling stock.

Electrical Engineering; senior year; first semester; 2 credits; 2 recitations. Text: Harding, Electric Railway Engineering.

310. Electric Railways. Continuation of courses 309. A study of conditions governing the electrification of trunk lines; systems of electrification and transportation economics.

Prerequisite: E. E. 309. Electrical Engineering; senior year; second semester; 3 credits; 3 recitations. Text: Electric Traction for Railway Trains.

313. Telephony and Telegraphy. A general study of the application of electricity to the transmission of intelligence. Manual and automatic telephony, duplex and quadruplex telegraphy, submarine and wireless telegraphy.

Prerequisite: E. E. 102. Electrical Engineering; senior year; second semester; 2 credits; 2 recitations.

314. Radio Communication. A study of the theory and methods of radio communication, with special reference to the U. S. Signal Corps Service.

Prerequisite: E. E. 101. Electrical Engineering; senior year; second semester; 2 credits; 2 recitations.

316. Illuminating Engineering. A study of artificial light sources and the application of these sources to illumination, both exterior and interior.

Electrical Engineering; senior year; second semester; 2 credits; 2 recitations. Text: Wickenden, Illumination and Photometry.

317. Public Service Regulation. A study of regulation by commissions, service rules, appraisals, depreciation, and rate making.

Electrical Engineering; senior year; first semester; 2 credits; 2 recitations. Text: Hayes, Public Utilities.

318. Central Stations. A study of the problems arising in the operation of electric systems. Organization, operating problems, public policy, cost accounting, rate study, etc.

Electrical Engineering; senior year; second semester; 2 credits; 2 recitations.

403. Study of Electric Machinery. Class room and laboratory study of electrical instruments, current, electromotive force and power relations; the operation, care, and management of familiar types of generators and motors, both alternating and direct current, and transformers.

Prerequisites: Elementary Chemistry, Physics, Calculus, Mechanics. Mechanical, Mining, and Logging Engineering; junior or senior year; either semester; 3 credits; 1 recitation; 1 laboratory period. Fee \$2.50. Deposit \$3.00. Text: Gray, Principles and Practice of Electrical Engineering.

406. Electric Lumbering Machinery. A special study of the application of electricity to the lumbering and logging industry.

Prerequisite: E. E. 403. Logging Engineering; senior year; second semester; 2 credits; 2 recitations.

408. Electric Mining Machinery. A study of the use of electricity in mines and mining operations.

Prerequisite: E. E. 403. Mining Engineering; senior year; second semester; 2 credits; 2 recitations.

410. Electric Machine Drive. The characteristics of electric motors and their applications to machine shop tools and allied industries.

Prerequisite: E. E. 403. Mechanical Engineering; senior year; second semester; 2 credits; 2 recitations.

EXPERIMENTAL ENGINEERING

SAMUEL HERMAN GRAF, Professor
CHARLES EDWIN THOMAS, Assistant Professor
_____, Instructor
_____, Assistant

The courses in engineering laboratory practice are designed to familiarize the student with processes of investigation; to afford experience in conducting and reporting experimental engineering work; to secure data which shall verify and supplement theoretical instruction; and, to some extent at least, to give a practical knowledge of construction and management of machinery and apparatus.

Appropriate divisions of this work are regularly taken by students in all branches of Engineering, Forestry, and Industrial Arts, and may be elected by students in other courses. Special courses are offered, as listed in what follows, to meet the needs of the students in the different lines of work. An earnest effort is made, not so much to impart a mass of detail, as to develop in the student his powers of observation and his capacity for independent thought.

Reports are required of all experiments, and are regarded as a most important part of the work. They are carefully read and criticised as to form, neatness, conciseness, accuracy of expression and spelling, as well as accuracy of technical data and calculations. With this training, when the student completes the work, he should know how to prepare an acceptable engineering report, or how to arrange data for publication.

Equipment. Appropriate portions of the equipment for this work are utilized by all departments in Engineering and Forestry. The equipment comprises the following divisions: a materials-testing laboratory, a cement-testing laboratory, a steam laboratory, and a gas-engine and hydraulic laboratory. These divisions have in common the equipment for the preliminary work, such as calculating devices, planimeters, Amsler integrator, micrometers, and other general apparatus.

The materials-testing laboratory occupies the northwest corner of the first floor of Mechanical Hall and contains the following: a 150,000-pound Riehle universal testing machine fitted with extension table for beams up to 16 feet in length; a 50,000-pound Riehle automatic and autographic testing machine; a 60,000-pound-inch Olsen torsion-testing machine; a 400-foot-pound drop-testing ma-

chine and a static load-testing machine, both of which were built in the College shops; a Landgraf-Turner alternating impact testing machine; a Case tempering furnace with pyrometer; Scleroscope and Brinell ball hardness testers; Tassin metallographic outfit; Bausch and Lomb inverted metalloscope; Leeds and Northrop transformation range apparatus; grinding and polishing equipment; and auxiliary apparatus including a deformer, torsion indicator, compression micrometers, several extensometers, deflectometers, and other minor pieces.

A part of the materials laboratory also is devoted to the testing of materials for highway construction. This equipment includes the following: Olsen impact machine for toughness tests; Riehle machine for hardness tests; ball mill, molding machine, and impact machine for cementing value tests on rock dust; rattler for abrasion tests on macadam or paving-rock, another for paving-brick; core drills and saw for cutting stone specimens; shakers and sieves for mechanical analysis of sand and aggregates, including a set of Tyler standard screen scale sieves; penetrometer, viscosimeter, float test, Osborne adhesive machine, centrifuges, and other appliances for making physical tests of bituminous cements and road oils.

The cement testing laboratory, also located in Mechanical Hall, is equipped with convenient iron-topped tables for mixing, intended to accommodate six students each. Apparatus is provided sufficient for making all the standard A. S. C. E. tests, as well as for some additional experiments. There are a large number of briquette, cube, and special cylinder molds, three Vicat needles, Gillmore needles, screens, including a standard set, damp closet, aging tanks, boiling test apparatus, autoclave, briquette molding machine, a 1000-pound Fairbanks cement-testing machine, permeability apparatus for testing various mixtures or water-proofing compounds, and small apparatus including balances, specific gravity flasks, trowels, sampling irons, etc.

The steam laboratory, located in the New Heating Plant, contains the following machines: a 7x8 throttling engine used principally for experiments on valve setting, a 9x10 Ideal automatic high-speed engine driving a 30 KVA, 3-phase generator, a 15 b. h. p. two-stage Kerr turbine, an 8x18 simple Murray Corliss engine, and a 6¼ and 10½x6¼ Sturtevant vertical compound engine. The last three of these are so arranged that they may be run either condensing or with atmospheric exhaust. The condenser

and vacuum pump are so equipped that the cooling water may be measured by means of a Venturi meter and the condensed steam by a Kennicott water-weigher. The engines are all fitted with gauges, sampling pipes, indicator connections, and brakes of various types.

For tests on boilers and their auxiliaries there are available the equipments of both the old and the new heating plants. The former consists of three Flanner water-tube boilers, aggregating seven hundred horse-power. These are coal fired and fitted with modern auxiliary equipment, including feed water meter, ash handling system, draft gauges, thermometer wells, flue gas sampler, etc. In the old plant there are three fire-tube boilers of about 170 horse-power, total capacity, for which cordwood and waste from the College wood shops are used for fuel.

Of smaller power laboratory equipment there may be mentioned a General Electric steam meter, pressure gauge tester, Schaeffer and Budenberg indicator calibrating device, seven indicators including a Trill instrument for continuous diagrams, several reducing wheels, two steam calorimeters, Parr and Emerson fuel calorimeters, sargent gas calorimeter, flue gas analysis apparatus, two pyrometers, draught gauges, recording and indicating pressure gauges, etc.

For work on power transmission, a transmission dynamometer and a special belt-testing machine are provided. Tests may also be made on lubricants, bearing metals, and different types of bearings, by means of a Golden bearing and oil dynamometer, or a pendulum type oil-testing machine. There are also at hand the usual minor pieces, as flash point apparatus, viscosimeters, etc.

The gas engine and hydraulic laboratory is located in the old Power Plant building. The gas engine equipment consists of nine four-cycle and three two-cycle gasoline and oil engines, and an 8-inch Reeco-Ericson hot-air engine. All of these are especially fitted for testing and demonstration, the largest, a 20-H. P. Bessemer oil engine, being direct connected to a high pressure pump. In the same room are also installed a Gardner air compressor and two centrifugal blowers for work on air compression and transmission. The hydraulic section contains the following: a centrifugal pump driven by a rated variable speed motor, several steam pumps, a 4x6 Goulds triplex pump, 12-inch Doble laboratory water motor, two hydraulic rams, 2-inch Venturi meter, current meter, two ordinary service meters, calibrating tanks, orifice boxes

with suitable plates and orifices, weirs, hook gauge, and other small apparatus. In addition to work in the laboratory, measurements and tests of neighboring streams and installations may be made.

The following courses are offered:

201. Applied Mechanics Laboratory. A study of experimental investigation, reduction of data, mechanical calculating devices, and the preparation of neat, concise, and accurate reports. The calibration of various measuring instruments such as gauges, pyrometers, transmission dynamometers, etc., is then taken up. After this follow exercises in the measurement of power, including a test of the transmitting capacity and slip of belting. Transverse, tensile, compressive, torsion, and other standard tests of the common materials of construction are made; the heating value of a sample of coal is determined; the course being then concluded by two exercises on the properties of an assigned lubricating oil.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. Statics and Dynamics, (M. E. 251), and Elements of Thermodynamics (M. E. 319), should also be taken in conjunction with this course. Course in Mechanical Engineering; junior year; first semester; 3 credits apportioned as follows: preparation, $\frac{1}{2}$ credit; laboratory, 1 credit; report, $1\frac{1}{2}$ credits. Fee \$3.00. Text: Carpenter and Diederichs, Experimental Engineering.

202. Power and Hydraulic Laboratory. A continuation of course 201, beginning with the use and calibration of the indicator and planimeter. Tests are then made on steam and gas engines, a boiler, an impulse water wheel, pumps, an air compressor, and other power equipment. Exercises are given in the setting of Corliss and slide valves, and the course is concluded with an economy test of a steam turbine operating condensing.

This work is covered in fifteen laboratory exercises, one each week, and a careful report of each experiment is required.

Prerequisite: Exp. E. 201. Thermodynamics (M. E. 320), must be taken in conjunction with this course. Course in Mechanical Engineering; junior year; second semester; 3 credits; apportioned as for course 201. Fee \$3.00. Text: Carpenter and Diederichs, Experimental Engineering.

203. Advanced Mechanics Laboratory. A rather general course in experimental mechanics dealing with more advanced studies of materials, fuels, lubricants, bearing metals, belting, etc.,

with special reference to the application of the results to the requirements of the mechanical engineer in actual practice. Reports required.

Prerequisites: Exp. E. 201 and 202. Course in Mechanical Engineering; senior year; first semester; 3 credits, apportioned as for courses 201 and 202. Fee \$3.00. Texts: Carpenter and Diederichs, Experimental Engineering. G. B. Upton, Materials of Construction.

204 Advanced Power Laboratory. A course dealing with steam, gas, and hydraulic machinery. Various tests and studies are made on the following: a triplex pump, an air compressor, a centrifugal blower, a steam turbine, a compound engine; a complete test of a simple condensing Corliss engine, including the heat balance and an application of Clayton's analysis. Following this there are eight exercises on internal combustion engines of various types, including two- and four-cycle gasoline and oil engines, various types of automobile and marine engines, and finally a complete test of an oil engine of the semi-Diesel type. Complete reports are required as in the other courses previously listed.

Prerequisite: Exp. E. 203. Course in Mechanical Engineering; senior year; second semester; 3 credits, apportioned as for the preceding. Fee \$3.00. Text: Carpenter and Diederichs, Experimental Engineering. Assigned references.

205. Applied Mechanics Laboratory. Fifteen experiments consisting of exercises selected chiefly from courses 201 and 203. A course designed especially for the seniors in Electrical Engineering.

Prerequisites: Phys. 101 and 102, Math. 51 and 52, and all of the Mechanical Engineering courses required of Electrical Engineering juniors. Heat Engines and Boilers (M. E. 318) should precede this course. Course in Electrical Engineering; senior year; first semester; 3 credits, distributed as for course 201. Fee: \$3.00. Text: Moyer, Power Plant Testing.

206. Power and Hydraulic Laboratory. Similar in grade and purpose to the preceding. Consists of exercises selected from courses 202 and 204.

Prerequisite: Course 205. Course in Electrical Engineering; senior year; and course in Chemical Engineering, junior year; second semester; 3 credits, apportioned as in the preceding. Fee \$3.00. Text: Moyer, Power Plant Testing.

207. Applied Mechanics Laboratory. This course is similar, in range of equipment studied, to course 201, but since it is intended for students in the Industrial Arts course who do not have some of the theoretical work in power engineering, the work is taken up in a more general manner, stress being laid on those principles and details which are of special value to the teacher of manual training. Some time is also taken to explain the theory involved, and the students are taught to prepare neat and accurate reports of their work.

Prerequisites: Math. 11, and Phys. 1 and 2. Course in Industrial Arts; senior year; first semester; 3 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 2 credits. Fee \$3.00. Text: Moyer, Power Plant Testing.

208. Power and Hydraulic Laboratory. A course similar in grade to the preceding, designed for seniors in the Industrial Arts course. The work consists of fifteen laboratory exercises along the lines of those for course 202, and the usual reports are required.

Prerequisite: Exp. E. 207. Required in Industrial Arts; senior year; second semester; 3 credits, apportioned as for course 207. Fee \$3.00. Text: Moyer, Power Plant Testing.

210. General Engineering Laboratory. A course designed for seniors in Mining Engineering and Ceramics, or for others who desire a brief, comprehensive course in mechanical laboratory practice. The work consists of ten exercises selected from courses 201 and 202, and embraces tests on materials, hydraulic machinery, and steam and gas engines. Reports are required as in the preceding.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. Courses in Mining Engineering and Ceramics; senior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; report and preparation, 1 credit. Fee \$2.00. Text: Moyer, Power Plant Testing.

225. General Materials Testing Laboratory. A course designed especially for students in Chemical Engineering, and for others desiring a general course dealing with a wide range of materials, methods, and equipment. The purpose is to cover those tests on materials which the industrial chemist in a commercial or city testing laboratory is required to make. Methods standardized by the American Society for Testing Materials and other recognized organizations, are used throughout. The work consists of fifteen exercises including tests on cement, bituminous and non-bituminous road materials, structural materials, lubricating oils, and fuels.

Prerequisite: M.E. 251 should be taken in conjunction. Course in Chemical Engineering; senior year; first semester; or elective to suitably prepared students in other courses; 3 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 2 credits. Fee \$3.00. Text: Assigned references.

231. Cement and Highway Laboratory. An experimental study of Portland cement; standard A. S. T. M. and other methods of cement testing; examination of sands, grading of aggregates, determination of voids, etc., abrasion, hardness, toughness, cementing value, and other tests on macadam rock; tests of paving brick; standard tests on bituminous compounds and paving aggregates.

This course is of broad scope, but is still sufficiently detailed to give the student a good working basis for the intelligent interpretation and preparation of specifications for the materials treated.

Prerequisites: Phys. 101 and 102 and Math. 51 and 52. Roads and Pavements, (C. E. 405), should be taken in conjunction with this course. Courses in Civil, Highway, and Irrigation Engineering; junior year; first semester; 2 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 1 credit. Fee \$3.00. Text: Hatt and Scofield, Laboratory Manual for Testing Materials. U. S. Office of Public Roads' Bulletins, No. 314 and 347. Hubbard, Laboratory Manual of Bituminous Materials.

232. Structural Materials Laboratory. Standard tests of timber, iron, steel, brick, stone, etc., with special reference to the methods and specifications adopted by the American Society for Testing Materials, and other national engineering organizations. Following the general tests, some time is devoted to work on plain and reinforced concrete.

Prerequisites: Phys. 101 and 102, and Math. 51 and 52. This course should be preceded by course 231, and Strength of Materials (M. E. 252), should be taken in conjunction with it. Courses in Civil, Highway, and Irrigation Engineering; junior year; second semester; 3 credits, apportioned as follows: laboratory, 1 credit; preparation and report, 2 credits. Fee \$3.00. Text: Hatt and Scofield. Laboratory Manual for Testing Materials. Mills, Materials of Construction.

233. Advanced Highway Laboratory. Following course 231, and designed particularly for those specializing in Highway Engineering. Different road and paving materials and binders are tested and their relative values determined. Sheet asphalt mix-

tures and bituminous mortars are studied, to determine the effects of various changes in the grading of the aggregates. Finally, samples of various types of roads and pavements are analyzed for density, composition, and grading, with special reference to their conformity with specifications under which built.

Prerequisites: Exp. E. 231, and C. E. 405. Course in Highway Engineering; senior year; first semester; 2 credits, apportioned 1 to laboratory work and 1 to report. Fee \$3.00. Text: Hubbard, Laboratory Manual of Bituminous Materials. Assigned reference.

235. Advanced Materials Laboratory. An advanced course offered as an elective to students who have completed course 232, and who desire additional laboratory work on materials. In the past, tests have been made on reinforcing steel, reinforced beams, hooped columns, water-proofing of concrete, thermal conductivity of concrete, study of stresses by strain gauge, etc., but the course is varied according to the special interests and desires of the students electing the work.

The course on Reinforced Concrete (C. E. 557), must either precede this course or be taken at the same time. The course cannot be given unless elected by at least five students. Second semester; 2 credits: laboratory, 1 credit; report, 1 credit. Fee \$3.00. Text: Mills, Materials of Construction.

238. Timber Testing. A special course designed to meet the requirements of the students in Forestry. The work is covered in eight laboratory exercises, embracing cross-bending, compression, shearing, cleavage, and other standard tests of timber; a study of the effect of moisture content on strength; and a study of impact loads. The formulas for the reduction of data from tests are explained; and the students are taught the preparation of neat, accurate reports, such being required on all tests. In general, the methods and bulletins of the U. S. Forest Service will be used as a guide in the work.

Prerequisites: Phys. 1 and 2. Course in Forestry; senior year; second semester; 1 credit. (Note: The work is covered in one three-hours laboratory period a week during the first half of the semester, for which one-half credit is allowed. The other half credit is given for the reports.) Fee \$2.00. Text: Record, Mechanical Properties of Wood.

241. Concrete Laboratory. An elective course designed for those desiring instruction in the testing and proportioning of con-

crete-making materials. The first half of the course is the same as that of course 231 including principles of sampling, testing of cement and sands, grading of aggregates, etc. The latter part of the course includes tests on reinforcing steel, reinforced beams, water-proofing compounds, thermal conductivity of concrete, and concrete analysis.

Prerequisites: Physics 101 and 102, and Math. 51 and 52. Especially designed as an elective for seniors in Electrical and Mechanical Engineering, but suitable for students in other courses as well. First semester; 2 credits, apportioned 1 to laboratory and 1 to report. Fee \$3.00. Text: Taylor and Thompson, Concrete, Plain and Reinforced. Assigned references.

246. Metallography and Technical Pyrometry. A course of lectures and laboratory work designed to give a working knowledge of the methods of study of structure of metals and alloys. Particular attention is given to the correlation of thermal and mechanical treatment with the structure and physical properties of iron and steel. In connection with thermal analysis and heat treatment practice, the calibration and use of various types of pyrometers are taken up. A practical knowledge of the subject is obtained by laboratory experiments in heat treatment, preparation of specimens, etching, studying the structure under the microscope, and taking photo-micrographs. Whenever possible, physical tests are made to show the effects on strength, ductility, hardness, or other mechanical properties of the different thermal treatments or other industrial processes.

Elective in the course in Chemical Engineering, senior year; also elective to other suitably prepared students. Second semester; 3 credits, apportioned 2 to lectures and preparation, and 1 to laboratory. Fee \$3.00. Text: Sauveur, Metallography and Heat Treatment of Iron and Steel. Assigned references.

255. Steam Laboratory. A brief practical course on steam engines, boilers, and auxiliaries, intended for students in Logging Engineering. The work consists of eight exercises, including tests and studies of the following: pressure and vacuum gauges; steam calorimeters; injectors and feed pumps; boilers; slide-valve, automatic, and Corliss engines. A report is required for each exercise.

Note: Heat Engines and Boilers (M. E. 317), must be taken in conjunction with this course.

Course in Logging Engineering; junior year; first semester; 1 credit. Fee \$2.00.

262. Hydraulic Laboratory. Study of methods of measuring water, calibration of weirs, orifices, water meters, etc. Determination of friction and loss of head in pipe lines and fittings. Study of water hammer, and test of hydraulic ram. Tests on water wheel, centrifugal, triplex, and other pumps. The work is covered in fifteen three-hours laboratory exercises, and a report of each test is required.

Prerequisites: Math. 51 and 52, and I. E. 102. Course in Irrigation Engineering; senior year; second semester; 2 credits: laboratory, 1 credit; reports, 1 credit. Fee \$2.00.

265. Hydraulic Laboratory. A brief course of a practical nature intended to accompany the course in Hydraulics (I. E. 101), for students in Drainage and Irrigation. Studies and tests are made on the following: pressure and vacuum gauges; methods of measuring water; flow of water through pipes and orifices; hydraulic ram; water wheel; and various types of pumps. The work is covered in eight laboratory exercises, a report being required for each.

Note: Hydraulics, I. E. 101, must be taken in conjunction with this course.

Course in Drainage and Irrigation; senior year; first semester; 1 credit. Fee \$2.00.

272. Gas-Engine Laboratory. Study of internal combustion engine fuels, mechanical details of engines, battery and magneto ignition systems, carburetors, and methods of governing. Analysis of gas engine cycles from indicator diagrams. Mechanical efficiency, regulation, and fuel economy tests. Economy, power, and tractive effort of automobiles. Complete test of oil engine of the semi-Diesel type.

The work is covered in ten laboratory exercises, and a report is required for each.

Prerequisite: Physics 101 and 102 or an equivalent. It is recommended that the course on Internal Combustion Motors (M. E. 346) either precede the course, or be taken in conjunction with it. An elective course; either semester; 2 credits, apportioned 1 to laboratory and 1 to reports. Fee \$2.00. Text: Streeter, Internal Combustion Motors.

291. Experimental Research Problems. An opportunity is given for advanced and suitably prepared students who are interested in engineering research, to work out original problems. These may be either of their own choosing, or suggested by the department, and may cover any subject within the scope of the department laboratories.

Prerequisites: Must be approved in each case, as they would vary with the work proposed. Elective to seniors and graduate students; first semester; 2 credits. Fee to be arranged.

292. Experimental Research Problems. A continuation of course 291.

Elective to seniors and graduate students; second semester; 2 credits. Fee to be arranged.

INDUSTRIAL ARTS

HENRY CLAY BRANDON, Professor
WILLIAM McCULLY PORTER, Instructor
AMBROSE ELLIOTT RIDENOUR, Instructor
CHARLES GEORGE WILTSHIRE, Instructor
* DARWIN GREENE THAYER, Instructor
MARTIN LEWIS GRANNING, Instructor

There is a steadily increasing demand in Oregon for competent teachers of manual training. These instructors teach in both the elementary and high-school grades. In fact, the up-to-date school provides for manual, or constructive, work of various kinds from the first grade up. The well-trained teacher must therefore understand both the technique and theory of his subject as adapted to the needs of pupils.

Below the seventh grade this manual instruction for both boys and girls is given by the regular grade teachers; but the supervisor and special teacher of manual training should be able to organize this work and correlate it with the other school subjects, and particularly with the later formal course in manual arts. For the boys, this will take the form of instruction in woodworking, metals, machine shop, and in some schools, vocational training in the various trades. For the girls, it will lead to the study of the several phases of home economics.

A college degree course of the same general standard as the other B. S. courses is provided, in order that the young men who specialize in this field may receive a preparation that will place them on a par with high-school teachers in other branches. The relation of industrial instruction in the elementary and secondary schools to the industries of life, is more fundamental and direct than most of the other branches taught. It also has its important relations to higher education. It becomes necessary, therefore, to give these instructors a training that will make them more than masters of the mechanical processes.

The properly prepared teacher of industrial arts must have an appreciative understanding of the origin and development of the industries; their relation to economic, social, and political life; and a profound conviction of the importance and dignity of their contribution to the progress of mankind. He should also have the broad sympathies of the cultured man, in order to enable him to

* On leave of absence.

set before his pupils high and worthy ideals of life. The artisan, artist, or professional man is first of all a man and a citizen, and our schools must make him aware of his high privileges and responsibilities.

The Industrial Arts department is a part of the School of Engineering and has under its supervision all the shop courses offered in the other departments of the College.

Equipment. This department provides the necessary equipment for carrying on the different lines of shop work in the degree and vocational courses.

The Wood Shop, supplied with the best machines and tools the market affords, contains twenty-four double benches of modern design, accommodating forty-eight students. Each bench is provided with patent rapid action vises for holding the work, and is furnished with two sets of hand tools, consisting of rip saws, cutoff saws and backsaws, planes, chisels, marking gauges, try-squares, hammers, dividers, and oilstones. The machine equipment of this shop consists of fifteen wood-turning lathes, each furnished with a set of tools; one iron saw-table with rip and cut-off saws, one hand saw, one jig saw, 24-inch surface planer, 16-inch glue joiner, one hollow chisel mortiser and one belt sander, built by the students, and two grindstones. There are also two glue tables with clamps of various sizes, two electric glue heaters. The power is furnished by two three-phase induction motors of 15- and 5-horse-power.

The Forge Shop contains forty-two down-draught forges of the most approved pattern. Blast is furnished by a steel pressure blower driven by a 10-horse-power induction motor, and the smoke and gases are removed by an 80-inch exhaust fan, driven by a 20-horse-power motor. Each forge is provided with anvil, hammers, hardies, tongs, and other small tools. An emery grinder, built by students, has been added to the equipment. There are also swedge blocks and vises at convenient points in the room for general use.

The Machine Shop contains one 24x24-inch iron planer, one 15-inch shaper, one 12-inch shaper, one universal milling machine, one universal tool grinder, one wet tool grinder, one radial drill, one 20-inch drill press, one sensitive drill press, one 20-inch engine lathe, one 16-inch engine lathe, one 16-inch universal turret lathe, one 14-inch modern geared lathe, five 14-inch engine lathes, two 10-inch speed lathes, one shop saw, one automatic knife grinder,

and twelve bench vises. A 20-horse-power induction motor furnishes the power. A tool room adjacent contains the small tools, such as twist drills, taps, dies, reamers, calipers, gauges, and scales. These tools are given out to the students on the check plan.

The Plumbing and Steam Fitting Shop is equipped with all of the hand tools necessary for cutting, threading, and general pipe work, as well as gasoline torches, soldering outfits, and other apparatus for making lead-pipe connections and wiped joints.

The Foundry contains a 22-inch Colliau cupola having a capacity of two tons per hour, one 1200-pound crane ladle, one 800-pound crane ladle, bull ladles, and hand ladles, one 16-inch brass furnace, brass molder's tub, crucibles, one large core-oven, one portable core-oven, one two-ton jib crane, one wall crane for charging floor, one Delano pulley molding machine No. 2, besides shovels, rammers, and small tools to accommodate twenty students at one time. An emery grinder, built by the students, has been added.

DEGREE COURSE IN INDUSTRIAL ARTS

Freshman Year	Semester	
	1st	2nd
Modern English Prose (Eng. 81, 82).....	3	3
Trigonometry (Math. 12).....		3
Commercial Geography (Com. 200).....	3	
General Chemistry (Chem. 100, 101).....	3	3
Shop Drawing (Ind. Arts 301, 302).....	2	2
Manual Training (Ind. Arts 103, 104).....	3	3
Industrial Arts Drawing (Art 411).....		2
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....	$\frac{1}{2}$	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. E. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16½	<hr/> 17½

	Semester	
	1st	2nd
Sophomore Year		
Modern Language or Approved Elective.....	3	3
General Physics (Phys. 1, 2).....	3	3
Patternmaking, Foundry (Ind. Arts 135, 174).....	3	3
Woodwork (Ind. Arts 113).....	2	
Industrial Arts Design (Art 412).....	1	
Drawing (M. E. 156).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	½	½
Electives	3	3
	<hr/> 16½	<hr/> 16½

Junior Year		
Modern Language or Approved Elective.....	3	3
General Psychology (Ind. Ed. 101).....	3	
Principles of Education (Ind. Ed. 131).....		3
Educational Psychology (Ind. Ed. 102).....		2
Forging (Ind. Arts 155).....	2	
Hammered Metal Work (Ind. Arts 156).....		2
Elementary House Planning (Arch. 701).....	3	
Descriptive Geometry (M. E. 152).....		3
Commercial Woods (For. 506).....	2	
Plumbing (Ind. Arts 270).....		2
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives	2	
	<hr/> 17	<hr/> 17

Senior Year		
Special Methods (Ind. Ed. 172).....		2
History and Theory of Vocational Education (Ind. Ed. 125)	2	
Machine Shop (Ind. Arts 208, 209).....	2	2
Manual Training for Elementary Grades (Ind. Arts 231).....		2
Machine Drawing and Design (M. E. 207).....	3	
Applied Mechanics Lab. (Exp. E. 207).....	3	
Power and Hydraulics Lab. (Exp. E. 208).....		3
Electives	6	7
	<hr/> 16	<hr/> 16

The following courses are offered:

103. Manual Training. Designed to meet the needs of those students who desire to teach manual training in the sixth, seventh, eighth, and ninth grades of the public schools. A course in wood construction and design, including theory and practice in the proper use of tools; a study of the growth and structure of woods; shrinkage, warpage, and seasoning of timber; staining and finishing. Considerable attention is given to a study of shop methods, equipment, courses of study, and proper methods of conducting class work.

Course in Industrial Arts; freshman year; either semester; 3 credits; 3 laboratory periods. Fee \$6.00. Deposit \$1.00. Text: Griffith, *Essentials of Woodwork*.

104. Manual Training. Continuation of 103; freshman year; either semester; 3 credits; 3 laboratory periods.

Fee \$6.00. Deposit \$1.00. Text: Griffith, *Essentials of Woodwork*.

106. Woodwork. The purpose of this course is to give instruction in the care and use of modern woodwork benches and their equipment. Six lectures will be given in this course, each lecture followed by a practical application. Skill in the manipulation of tools cannot be obtained in this short time, but instruction and practice will be given in sharpening chisels, planes, and other edge tools; in jointing, setting, and filing handsaws.

The principal feature of this course will be the instruction and practice in the use of the steel square in brace work and rafter construction.

Elective, course in Agriculture; freshman year; first or second semester; 1 credit; 1 laboratory period. Fee \$2.00. Deposit \$1.00.

110. Woodwork. A course for Logging Engineering students, consisting of a series of constructive exercises in carpentry and joining, accompanied by lectures dealing with the care and use of bench tools, and the proper method of laying out work.

Logging Engineering course; freshman year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

111. Woodwork. A continuation of course 110 for Logging Engineering students. This course takes up the use of the steel square in building construction, and the design and construction of trestles, trussed roofs, and timber bridges.

Logging Engineering course; freshman year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

113. Woodwork. Correct use of the steel square in laying out practical carpenter work, windowsills and doorsills, bay and circular windows, steps, stairs, etc.; detailed construction of the window and door frames, sills, caps, weights, and fastenings in relation to the rough framework and the exterior and interior finish of the building are taken up.

In like manner, the construction of cornices, gutters, brackets, columns, and newel posts is taken up. As soon as the students become familiar with the detailed construction of the above, they are assigned problems involving original design and construction. Practice in reading plans, filling out material bills, and estimating the cost of material and labor, is a strong feature of the course. So far as possible, drawings furnished by the architectural department are used in this work.

Industrial Arts and elective; sophomore year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

116. Cabinetwork. This course consists of the designing and construction of furniture according to the ability of the individual student. Mixing of stains, fillers, and various finishes, with their application, is a strong feature of the course.

Included in the work is a study of the design and construction of drawers and panel work, and primary upholstering.

Elective; freshman year; either semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

131. Patternmaking. This course consists of a series of exercises in planing and chiseling to familiarize the student with the proper use of tools; of practical exercises emphasizing the necessity of draught, core prints, core boxes; of exercises showing the necessary allowance for shrinkage of iron and other metals, and its effect on different shapes and thicknesses of castings. Exercises in wood-turning are given in conjunction with lectures on the lathe, its care and management, and the care and use of turning tools. From the simple exercise the student soon advances to the construction of patterns of parts of machinery and other structures, such as pulleys, pipe fittings, valves, gear wheels, dynamo frames, gas and steam engines, lathes, emery grinders, and other pieces of machinery.

The lectures explain the correct methods of constructing the more complicated work, the principles of molding directly related to patternmaking, shrinkage of metals, kinds of lumber best suited for patternmaking, the working and twisting of woods, glue and

metal fastenings, making cores and core boxes, methods of marking and storing patterns, estimating the weight of metal castings.

Course in Mechanical and Electrical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: International Correspondence School pamphlets.

132. Patternmaking. This course and the following are a continuation of Patternmaking and are intended for engineering students who desire to devote further time to the subject, or for those who are engaged in the preparation of these, or construction work.

The work will consist largely in making patterns for steam and gas engines and other complicated machines.

Elective; first or second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

133. Patternmaking. This course is offered to students having had the equivalent of a two-credit course in patternmaking, and comprises the construction of the more complicated patterns and core boxes necessary for the building of steam and gas engines or other machine parts.

Elective; first or second semester; 1 credit; 1 laboratory period. Fee \$2.00. Deposit \$1.00.

134. Patternmaking. Continuation of course 132.

Elective; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

135. Wood Turning and Patternmaking. The principles of wood turning are taken up with reference to their application to the useful arts. This leads to patternmaking, which forms the greater part of the semester's work. One hour a week is used for shop lectures and recitations upon topics of vital importance to the work, such as selection of material, fastenings and joints, shrinkage of wood, allowance for shrinkage of metal, etc.

The course in Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods. Fee \$6.00. Deposit \$1.00. Text: International Correspondence School pamphlets.

136. Patternmaking. This is a continuation of course 135, and is intended for those who desire to obtain a more detailed knowledge of the subject. The student has opportunity to enter more fully into constructive work in patternmaking, by making patterns

and core boxes for parts of machines to be built in the College shops.

Elective; junior or senior year; first or second semester; 3 credits; 3 laboratory periods. Fee \$6.00. Deposit \$1.00.

138. Wood Turning. This course consists of a series of exercises in wood turning intended to familiarize the student with the various uses of the lathe tools, methods of centering and chucking, segment work, staining, and polishing. Small pieces of furniture such as vases, bowls, rings, trays, tables, and stools will be worked out.

Elective Industrial Arts course; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

151. Blacksmithing. The student is taught to make and manage the forge fire; to shape iron by bending, upsetting, drawing, and welding. Many useful articles are made, consisting of hooks, staples, rings, clevises, and chains.

Logging Engineering, Mechanical Engineering, and Electrical Engineering; sophomore year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00.

152. Toolmaking and Tempering. This course is devoted to the study of the heat treatment of steel as exemplified in making and tempering tools, springs, and other articles of steel.

Prerequisite: Course 151. The course in Mechanical Engineering; sophomore year; second semester; 1 credit; 1 laboratory period. The course in Logging Engineering; sophomore year; second semester; 1 credit; 1 laboratory period. Fee \$2.00.

153. Blacksmithing. A course for students in Agriculture. After completing the first exercise, the student enters upon work having direct application to farming, such as the mending of farm implements, making and mending of chains, clevises, and hooks; ironing of whiffletrees and neck-yokes; sharpening of tools.

Elective; Agricultural course; sophomore year; first semester; 1 credit; 1 laboratory period. Fee \$2.00.

154. Blacksmithing. A continuation of course 152, for students wishing to take an entire year of blacksmithing.

Elective; sophomore year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00.

155. Forging. This course deals with the equipment of the blacksmith shop, and includes exercises in bending, shaping, upset-

ting, and welding iron. Some instruction is given also in hardening and tempering steel, and in brazing. The course is accompanied with lectures on the management of the fire, methods of construction, and shop equipment.

The course in Industrial Arts; junior year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00.

156. Hammered Metal Work. This course consists of hand-wrought metal and enamel work, including hard and soft soldering, the formation of bowls, trays, boxes, lamp shades. The design and construction of furniture fittings.

The course in Industrial Arts; junior year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00.

158. Forging and Tool Dressing. After the minimum amount of preliminary work in forging iron, the remainder of the time is devoted to making, tempering, and dressing chisels, drills, and other steel tools.

The courses in Chemical Engineering and Mining Engineering; freshman year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00.

171. Foundry Practice. This course includes a study of the foundry equipment; care and management of cupolas; mixing and melting of iron; molding in green and dry sand; preparation of cores; casting in iron and brass.

The course in Mechanical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods. Fee \$3.00. Text: International Correspondence School Pamphlets.

173. Foundry Practice. A course in all respects equivalent to course 171.

The course in Electrical Engineering; freshman year; first or second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Text: International Correspondence School Pamphlets.

174. Foundry Practice. More comprehensive than course 171. Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods. Fee \$6.00.

175. Advanced Foundry Practice. Continuation of 171 and 173.

Elective; 2 credits; 3 laboratory periods. Fee \$4.00.

202. Machine Shop. The work in the machine shop includes both bench and machine work. Upon first entering the shop the

student is taught the principles of chipping, filing, and hand finishing. This occupies the first half of the semester. Machine work is then taken up through a series of exercises on lathe, shaper, planer, drill press, and milling machine. One hour of the student's time is required each week in the class room to attend lectures, work problems, or prepare other work assigned by the instructor.

The courses in Mechanical and Logging Engineering; sophomore year; second semester; 1 credit; 1 laboratory period. Fee \$2.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

203. Machine Shop. A continuation of course 202 devoted to machine construction and milling machine work. Special attention is paid to economical shop methods of doing work.

The course in Mechanical Engineering; junior year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

205. Machine Shop. This and the following courses are a continuation of 203.

Mechanical Engineering course; second semester; 3 credits; 3 laboratory periods. Fee \$6.00. Deposit \$1.00.

206. Machine Shop. A course similar to course 202, designed to meet the requirements of students in Electrical Engineering.

The course in Electrical Engineering; sophomore year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

207. Machine Shop. Continuation of 206.

Elective; Electrical Engineering students; junior year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

208. Machine Shop. This course begins with the hand processes of chiseling, filing, and polishing, which are followed by a detailed study of the lathe, drill press, planer, and shaper, taught by means of carefully planned exercises. The course includes one hour a week of lecture or recitation work to supplement the instruction given in the shop.

The course in Industrial Arts; senior year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

209. Machine Shop. A continuation of course 208 in which the student becomes familiar with the more complicated machines such as turret lathes, and milling machines. Shop methods are

studied with reference to economical production. The student, as far as possible, enters upon construction of machinery and apparatus for College equipment.

The course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00. Text: Halsey, Machine Shop Methods.

212. Machine Shop. Similar to 202.

Elective; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

213. Machine Shop. Continuation of 212.

Elective; second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

215. Automobile Maintenance, Repair, and Operation. This course is intended for those students who wish an intimate knowledge of the process of overhauling and repairing of automobiles. Considerable attention will be given to the various types of construction as employed in machines of different manufacturers. Machines will be taken apart and overhauled by the students.

Elective, first and second semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

228. Dairy Mechanics. This course is arranged for the students of Dairy Manufactures. An attempt is made to give in a brief way through lectures and laboratory work, a knowledge of plumbing, setting of line shafting, and the operation and repair of machinery, electric wiring, and the operation of electrical machinery. This work is given by instructors in the plumbing and machine shops, and in the electrical laboratory.

Dairy Manufacturers; senior or junior year; second semester; 1 credit; 1 laboratory period. Fee \$2.00.

231. Manual Training for Elementary Grades. This course deals with the design and construction of cardboard work, weaving, basket and mat work, stencil cutting, bookbinding, and other industrial subjects such as are taught in the first six grammar grades.

Prerequisite or parallel: Ind. Ed. 171. Course in Industrial Arts; senior year; second semester; 2 credits; 2 laboratory periods.

270. Plumbing. Course similar to M-1.

Elective; 2 credits; 2 laboratory periods; first and second semesters. Fee \$4.00.

301. Shop Drawing. This course is intended for those students who are specializing in Industrial Arts. In the beginning the work is devoted to the learning of the elements of drawing, the general use of the drawing instruments, lettering, general constructions, methods of representation and free-hand sketching. Considerable attention will be given to drawing of pieces of furniture and constructions in wood that may be worked out in the shops.

Course in Industrial Arts; first semester; 2 credits; 2 laboratory periods.

302. Shop Drawing. Continuation of 301.

Second semester; 2 credits; 2 laboratory periods.

MECHANIC ARTS

This is a vocational course extending through three years, during which the student devotes at least one-third of his time to shop work and trade drawing. English, mathematics, chemistry, physics, and elementary economics are also included in order to balance the course and give it educational value.

The student is permitted to specialize in the vocational work according to his individual preferences and qualifications. The choice of work includes Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

This is not to be regarded as a preparatory course for the degree courses in engineering. Such preparation can best be obtained in the regular accredited high schools of the State. Neither is it intended that this course shall entice students away from the high schools, but that it shall fill a need not generally provided for by the secondary schools of the State.

It is the purpose of this course to assist those who expect to make their way in the world by their manual skill in various lines of activity—those who feel that they cannot afford to take a degree course in college, but desire to get some vocational training in special lines, and at the same time secure the broadening influence of education in English, mathematics, and elementary science. While it is not the primary aim to train foremen and superintendents, it is believed that students after completing the course and gaining a few years of practical experience will be able to hold positions of responsibility, or to go into business for themselves.

The shops are equipped with the latest approved machinery and are well suited to carry on these practical courses.

This work is open to students who have completed the eighth grade, or equivalent, of the common schools, and who are sixteen years of age. Those who complete the three years of work and take all of the work outlined will be entitled to a diploma. In order to secure a diploma in Patternmaking, Carpentry and Cabinetmaking, Machine Shop Practice, or Plumbing, at least two years must be devoted to the desired subject. The other year may be devoted to selected courses subject to the approval of the head of the department. A general shop course may be taken by combining one year of Machine Shop, one year of Blacksmithing, and one year of Foundry Work; or one year of Woodworking, one year of Foundry, and one year of Machine Shop.

VOCATIONAL COURSE IN MECHANIC ARTS

	Semester	
	1st	2nd
First Year		
Vocational English (Eng. G, H).....	3	3
Algebra (Math. A, B).....	5	5
Elementary Commercial Geography (Com. H).....	2	
Elementary Industrial History (Com. K).....		2
Vocational Drawing (M. E. A-1, B-1).....	2	2
* Shop Work (According to trade selected).....	4	4
Drill (Military A, B).....	1	1
Gymnasium (Phys. Ed. 11, 12).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Second Year		
Advanced Vocational English (Eng. I, J).....	3	3
Shop Arithmetic (Math. O).....	4	
Plane Geometry (Math. L).....		4
Trade Drawing (M. E. A-2, B-2).....	2	2
Chemistry (Chem. A, B).....	3	3
* Shop Work (According to trade selected).....	4	4
Drill (Military C, D).....	1	1
Gymnasium (Phys. Ed. 13, 14).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

* Shop Work. The student will choose the general line of shop work which he desires to pursue from the following: Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

	Semester	
	1st	2nd
Third Year		
Geometry and Trigonometry (Math. T).....	4	
Elementary Industrial Problems (Com. J).....		3
Business Law (Com. P).....	2	
Shop Accounting (Com. F).....		2
Trade Drawing (M. E. A-3, B-3).....	2	2
Physics (Phys. A, B).....	3	3
* Shop Work (According to trade selected).....	4	4
Drill (Military E, F).....	1	1
Electives	2	2
	—	—
	18	17

The following courses are offered:

C-1. Carpentry and Cabinetmaking. The purpose of this course is to teach the pupil the elements of joinery as applied in cabinetmaking and the building trades. The beginning work is devoted to the principles of joining and to tool operations as involved in furniture making and interior finish, including design and construction, the proper use of tools, growth and strength of woods, shrinkage, warpage, and seasoning of timber, staining and polishing. Considerable attention is given to the making of working drawings of simple pieces of furniture which are built in the shops. A study of the steel square and its uses is taken up the second and the third years, and the practical use of the square are given in brace and detail roof construction. This work will be developed through the construction of parts of houses, barns, roofs, and bridges. In like manner, the construction of cornices, gutters, brackets, columns, window frames, and stairways is attempted. The erection of buildings in reduced scale and full-sized section of buildings is a strong feature of the course.

Supplementary lectures will be given upon the proper care of edged tools; the various woods used in building construction, their proper selection and treatment; the measurement of lumber, glues, nails, screws, bolts, nuts, pins, straps, and other fastenings. Roof trusses, spans and braces, and method of calculating their proper sizes; stair building, woodworking machinery, paints, shellacs,

* Shop Work. The student will choose the general line of shop work which he desires to pursue from the following: Cabinetmaking, Patternmaking, Machine Shop Work, Plumbing, Blacksmithing, and Foundry Work.

and varnishes; estimates and practice in working problems that are taken from the student's work, from trade journals and from actual plans and specifications of houses. These are some of the prominent features of the work.

Vocational course; Mechanic Arts.

First year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

D-1. Carpentry and Cabinetmaking. Continuation of C-1.

First year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

C-2. Carpentry and Cabinetmaking. Continuation of D-1.

Second year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

D-2. Carpentry and Cabinetmaking. Continuation of C-2.

Second year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

C-3. Carpentry and Cabinetmaking. Continuation of D-2.

Third year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

D-3 Carpentry and Cabinetmaking. Continuation of C-3.

Third year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

E-1. Patternmaking. The purpose of this course is to teach the elements of machine patternmaking. The student begins his course with exercises involving the use of bench tools, and the reading of working drawings. These exercises emphasize the necessity of draught, core prints, core boxes, of allowance for shrinkage of iron and other metals, and its effect on different shapes and thickness of castings. The student is taught how to join timber to prevent warpage and distortion of patterns by using segments, staves, ribs, etc. He is taught the meaning of trade names, such as boss, fillet, flange, rib, etc.; how to operate power machinery; to keep in repair belts and line shafting; to sharpen planer, and jointer knives, band saws; and how to select materials, such as glue, lumber, shellac, and fasteners.

Much of the constructive work is upon parts of machines that are being built in the College shops, such as pulleys, pipes, fittings,, valves, gear wheels, dynamo frames, lathes, emery grinders, gas engines, and other machinery.

More advanced work includes the calculation, laying out, and construction of globe valves; spur, bevel, and worm gearing propeller blades and cams.

Vocational course, Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00. Text: International Correspondence School Pamphlets.

F-1. Patternmaking. Continuation of E-1.

First year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00. Text: International Correspondence School Pamphlets.

E-2. Patternmaking. Continuation of F-1.

Second year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

F-2. Patternmaking. Continuation of E-2.

Second year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

E-3. Patternmaking. Continuation of F-2.

Third year; first semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

F-3. Patternmaking. Continuation of E-3.

Third year; second semester; 4 credits; 4 laboratory periods a week. Fee \$8.00. Deposit \$1.00.

G. Woodworking. This is a course in woodworking, including instruction in the care and use of bench tools. The student becomes an adept in the use of the steel square by exercises in brace and rafter cutting and roof framing, followed by lectures on various types of barn constructions. The practical work involves the construction of models of roofs, trusses, buildings and parts of buildings reduced in scale.

Vocational course in Agriculture; first year; first semester; 2 credits; 2 laboratory periods. Fee \$4.00. Deposit \$1.00.

J-1. Course in Forging. The purpose of this course is to teach the principles of forging as applied in the average jobbing shop. It deals with the method of building fires so as to obtain best results in heating; care and operation of fires and forges; the use of tools in the working out of nuts, bolts, bending of eyes, forging staple, gate hooks; bending and welding of rings and links; making of hooks, clevises, and the parts of wagons and farm

machinery; the forging of tools of high carbon steel and high speed steel such as chipping chisels, lathes, shapers, planers, and mill tools; blacksmith's and mechanic's hammers, knives, hatchets, draw knives, and other tools.

Special attention is given to the composition of iron and the various low and high speed carbon steels; and the treatment especially adapted for each grade, to annealing, tempering, and case hardening, with some lectures on the history and production of iron.

The student will have opportunity to get practical repair work on machinery brought in from the College farm—such work as plow sharpening, wagon and machine repairing. In fact, he will come in contact with most of the work that is done in an average jobbing shop.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

K-1. Course in Forging. Continuation of J-1.

First year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

J-2. Course in Forging. Continuation of K-1.

Second year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

K-2. Course in Forging. Continuation of J-2.

Second year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

J-3. Course in Forging. Continuation of K-2.

Third year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

K-3. Course in Forging. Continuation of J-3.

Third year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

L. Blacksmithing. The student enters upon work having direct application to farming, such as the making and mending of farm implements, chains, clevises, and hooks; the ironing of whiffletrees and neck-yokes; the repairing and sharpening of plows and other farm machinery. Short talks and demonstrations are given on the method of building fires so as to obtain the best results in heating, descriptions of fans and forges, the uses of tools for various forgings, and a study of the proper means of heating and treating materials to be used.

Vocational course in Agriculture; first year; second semester; 2 credits; 2 laboratory periods. Fee \$4.00.

M-1. Course in Plumbing. The purpose of this course is to teach the students those things that will meet the needs of the average plumber. The work consists of instruction and practice in the care and handling of tools; in working with fittings, traps, valves, faucets, etc.; in working with sewer, soil, waste, water, and gas lines; in cutting and threading water pipe to measurements, using different fittings; in making fine and wiping solder, and in wiping upright joints; in laying out and constructing plumbing for buildings of two or more stories, including apartments and offices; in making range boiler and other hot-water connections; and in the practical uses of the soldering iron. The following subjects secure attention: joint wiping under varying conditions, sewer pipe laying, farm plumbing with the use of septic tanks, water supply systems, plumbing without the use of lead, sheet lead working, and estimating of plumbing construction.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

N-1. Course in Plumbing. Continuation of M-1.

First year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

M-2. Course in Plumbing. Continuation of N-1.

Second year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

N-2. Course in Plumbing. Continuation of M-2.

Second year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

M-3. Course in Plumbing. Continuation of N-2.

Third year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

N-3. Course in Plumbing. Continuation of M-3.

Third year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

P-1. Foundry. In the foundry course, the importance of foundry practice in the industrial trades is fully recognized. Modern practices and methods, as carried out in the best commercial foundries, are closely followed. The work is varied and is such as to keep students alive with interest and to tax their ability enough to make them think. The course comprises the following: definition and names of tools, characteristics of molding sands, use and care of tools and flasks. The first exercises are intended to familiarize the student with the proper molding condition of the sand

and the correct use of the rammer and other tools. A variety of forms add interest to the work and present progressively the problems of joints, parting lines, follow boards, match plates, gates for molds, pouring basins and shrinkage gates. The patterns in general use are those for the numerous machine projects under development in the Industrial Arts department. Among other things, the student is given work germane to supporting copes, uses of gagers, and the use of solders and how to set them; facings such as sea coal, plumbago, talc, charcoal, and the preparation of facing mixtures; molding with good patterns, broken castings, skeleton patterns; sweeps; molding of sheaves, pulleys, manhole covers, and rings; brackets; gas engine cylinders; lathe beds, in open sand and pit work, are emphasized. In core making are given materials of core making, core mixtures, uses of core boxes, sweeps, core arbors, and core rods, provisions for setting large cores by hand and with crane, methods of venting, core baking, and the painting of cores.

In cupola management the student becomes proficient in preparing the cupola for a heat in charging and pouring off.

The work also includes practice in making castings in brass, bronze, and aluminum, and the making of alloys. Additional lectures are given on malleable castings, loam molding, steel founding, mixing and melting of iron, machine molding, and foundry appliances. The student is taught to keep account of the supplies and labor and be in a position to tell the cost of any article produced in the foundry, also the value of such articles as are turned out of commercial shops.

Vocational course; Mechanical Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00. Text: International Correspondence School Pamphlets.

Q-1. Foundry. Continuation of P-1.

First year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00. Text: International Correspondence School Pamphlets.

P-2. Foundry. Continuation of Q-1.

Second year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

Q-2. Foundry. Continuation of P-2.

Second year; second semester; 4 credits; 4 laboratory periods. Fee \$8.00.

P-3. Foundry. Continuation of Q-2.

Third year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00.

Q-3. Foundry. Continuation of P-3.

Third year; second semester; 4 credits; 4 laboratory periods.
Fee \$8.00.

T-1. Machine Shop Practice. For students who specialize in machine shop practice, there is work in chipping and filing straight and plane surfaces, filing two pieces to fit, and instruction in laying off and boring, followed by turning of various kinds of materials at different speeds and estimating of time and cost of work done by using different methods such as with and without gauges, gigs, etc., straight and taper turning, right and left hand thread cutting, single, double, square, and cutting of rack spur bevel and worm gears. There is instruction in the use and classification of gauges, micrometers, and calipers. The advantages of the uses of taps and dies, gigs, and special tools, are taken up; as are also the methods of center squaring, straight and taper turning and fitting, outside and inside screw cutting, chucking and reaming, finishing and polishing, drill tap and mandrel grinding, tap boring, uses of milling machine; tool making, such as taps, reamers, mill cutters, and gauges.

Practical experience is acquired through the construction of machinery, such as lathes, gas engines, steam engines, emery grinders, and through general repair work of the College.

Time cards and stock of material are kept of all work, so that the matter of cost of production is given careful consideration.

Vocational course; Mechanic Arts; first year; first semester; 4 credits; 4 laboratory periods. Fee \$8.00. Deposit \$1.00. Text: Starrett's Hand-book.

U-1. Machine Shop Practice. Continuation of T-1.

First year; second semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00. Text: Starrett's Hand-book.

T-2. Machine Construction. Continuation of U-1.

Second year; first semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00.

U-2. Machine Construction. Continuation of T-2.

Second year; second semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00.

T-3. Tool and Gig Making. Continuation of U-2.

Third year; first semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00.

U-3. Tool and Gig Making. Continuation of T-3.

Third year; second semester; 4 credits; 4 laboratory periods.
Fee \$8.00. Deposit \$1.00.

MECHANICAL ENGINEERING

GRANT ADELBERT COVELL, Professor
MARK CLYDE PHILLIPS, Associate Professor
OTTO BERGER GOLDMAN, Assistant Professor
JOHN JACOB KARSTETTER, Instructor

The course in Mechanical Engineering has for its purpose the preparation of young men for positions of usefulness and responsibility in the industrial life of the country.

The Pacific Northwest is just now entering upon a period of rapid progress in the building of railroads, the development of water power, the marketing of forest products, and the upbuilding of manufactories, all of which require men conversant with the general principles of engineering. It is the purpose of all engineering courses to contribute to this general advancement, by turning out graduates equipped with the necessary knowledge and skill to make them active factors in this great work.

It is the general plan of the course in Mechanical Engineering to lay a broad foundation in English, Mathematics, Chemistry, and Physics, accompanied by Drawing and Shopwork, during the first two years of the course. The work of the last two years is more technical and professional in its nature, consisting in a study of the principles involved in the development of power by steam engines, water wheels, gas and gasoline engines, and steam turbines. It also involves a critical study of the design of machines and materials entering into their construction, as well as tests to determine their efficiency.

Instruction is given by means of lectures, recitations, and laboratory exercises. The scientific principles involved in machines and mechanical movements are investigated with reference to the solution of problems in mechanical engineering. In the shops, the student learns the use of tools and the value of different methods of doing work from the standpoint of economical construction. In the draughting room, he learns to make working drawings and blueprints of machines, and to formulate designs of his own.

With these advantages to aid him, the ambitious student should be able to take and maintain a position in the general industrial and engineering development which is the leading and characteristic feature of the age in which we live.

Equipment. The laboratory equipment for this department in mechanics and power measurement, is described under Experimental Engineering. The shops are under the supervision of the department of Industrial Arts.

In addition to equipment listed under these two departments, there are two large draughting rooms, each with 40 drawing tables, drawing boards for each student, and a blue-print room, with printing frame, wash trays, etc.

DEGREE COURSE IN MECHANICAL ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (English 81, 82)*.....	3	3
Trigonometry (Math. 11).....	3	
College Algebra (Math. 21).....	2	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100, 101).....	3	3
Mechanical Drawing (M. E. 151).....	2	
Descriptive Geometry (M. E. 152).....		3
Foundry (Ind. Arts 171).....	2	
Patternmaking (Ind. Arts 131).....		2
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....	$\frac{1}{2}$	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Sophomore Year		
Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Physics 101, 102).....	4	4
Mechanical Drawing (M. E. 153).....	3	
Mechanism (M. E. 204).....		3
Commercial Geography (Com. 200)*.....	3	
Principles of Economics (Com. 210)*.....		3
Blacksmithing (Ind. Arts 151).....	2	
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind. Arts 202).....		1
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

* Upon approval of the Dean, students may substitute a Modern Language for English in the freshman year and for Commercial Geography and the Principles of Economics in the sophomore year.

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Elements of Thermodynamics (M. E. 319).....	3	
Thermodynamics (M. E. 320).....		3
Applied Mechanics Laboratory (Exp. E. 201).....	3	
Power and Hydraulic Laboratory (Exp. E. 202).....		3
Hydraulics (I. E. 103).....	2	
Machine Shop (Ind. Arts 203, 205).....	2	3
Machine Design (M. E. 205).....		4
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
	<hr/> 17	<hr/> 17

Senior Year

Machine Design (M. E. 206).....	3	
Power Plant Engineering (M. E. 321).....	2	
Electrical Machinery (E. E. 403).....	3	
Power Plant Design (M. E. 323).....		3
Advanced Mechanics Laboratory (Exp. E. 203).....	3	
Advanced Power Laboratory (Exp. E. 204).....		3
Power Plant Engineering (M. E. 322).....		2
Heating and Ventilating (M. E. 331).....		3
Seminar (M. E. 351, 352).....	1	1
Elective	4	4
	<hr/> 16	<hr/> 16

The following list of elective subjects is offered merely as a suggestion. Many other courses are available, both in engineering and in other schools of the College.

First Semester	No. of Credits
Hydraulic Pumps and Motors (I. E. 203).....	3
Compressed Air and Refrigeration (M. E. 325).....	2
Internal Combustion Motors (M. E. 346).....	2
Reinforced Concrete (C. E. 557).....	3
Experimental Research Problems (Exp. E. 291).....	2
Engineering Chemistry (Chem. E. 301).....	3

Second Semester

Water Power (I. E. 204).....	3
Contracts and Specifications (H. E. 607).....	2
Experimental Research Problems (Exp. E. 293).....	2
Metallurgy of Iron and Steel (Met. 410).....	2
Internal Combustion Motors (M. E. 346).....	2
Excavation, Explosives, and Blasting (Min. E. 226)....	2

The following courses are offered:

151. Mechanical Drawing. The use of instruments and elementary principles of mechanical drawing are taught by a graded series of plates, including simple practice sheets, principles of orthographic projection, etc., supplemented by recitations and lectures from a standard text.

As soon as practicable the copy sheets are discontinued and the student is required to make sketches and working drawings of typical machine details, such as pulleys, fly wheels, crank shafts, pump details, etc., from actual machines available in shops and drawing room. In addition, a special drill in free-hand lettering is given at the beginning of each period throughout the course.

Electrical Engineering, Mechanical Engineering; freshman year; Logging Engineering, sophomore year; first semester; 2 credits; 2 laboratory periods. Text: French, Engineering Drawing. Fee \$0.50.

152. Descriptive Geometry. This course consists of the graphic solution of problems involving the projection of lines, surfaces, and solids. Special effort is made to make the work as practical as possible and to make clear the application of Descriptive Geometry to actual drafting-room problems.

Chemical Engineering, Electrical Engineering, Mechanical Engineering, Mining Engineering; freshman year; second semester; 3 credits; 2 recitations; 2 two-hour laboratory periods. Text: Ferris, Elements of Descriptive Geometry.

153. Mechanical Drawing. A continuation of course 151 and includes laying out of gear-teeth curves and conventional methods of representing different kinds of gears. Exercises in structural-steel drafting are also given, as well as sheet-metal layouts of a large variety of intersections, joints, etc., from principles learned in Descriptive Geometry. The remainder of the semester is devoted to practical machine drafting of machines and apparatus to be built in the College Shops. All articles built in the Shops are

first detailed in the drawing room by the students from sketches and other data, and blueprints sent to pattern and machine shops. A number of standard sizes and a standard title are used, and every effort is made to have the work conform as closely as possible to good drafting-room practice.

Electrical Engineering and Mechanical Engineering; sophomore year; first semester; 3 credits; 3 laboratory periods. Text: French, Engineering Drawing. Fee \$0.50.

156. Mechanical Drawing. A course for second-year students in Industrial Arts. Similar to M. E. 153, except that the methods of teaching such a course are given more attention with a view of developing teachers for secondary schools.

Industrial Arts; sophomore year; second semester; 3 credits; 3 laboratory periods. Text: French, Engineering Drawing. Fee \$0.50.

161. Ship Drafting. This course will take up the consideration of problems ordinarily met with in drafting out designs of standard types of wood and steel vessels. It will include laying off and fairing a set of lines from given offsets, and preparation of the principal working structural plans such as midship section, deck plating, and bulk heads. Booms, masts, and fittings will be worked up in detail. Marine engines and boilers will be given consideration with a view of showing wherein they differ from the equipment of stationary power plants.

The course will be made as practical as possible by dealing only with what is considered best practice by leading builders and the specification writers of the Emergency Fleet Corporation. Students will be apprised of new developments in an earnest effort to cope with the necessities of the war emergency.

Prerequisite: M. E. 153. Elective either semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$0.50.

204. Mechanism. A study of mechanical movements, including velocity ratios; transmission of motion by linkwork, gearing, cams, and belting.

The course in Electrical and Mechanical Engineering; sophomore year; second semester; 3 credits; 2 recitations; 2 two-hours laboratory periods. The course in Logging Engineering; junior year; second semester; 3 credits; 2 recitations; 2 two-hours laboratory periods. Text: Keown, Elements of Mechanism. Fee \$0.50.

205. Machine Design. This course consists largely in applying the principles discussed in mechanism and in mechanics to the

design of machine parts. The work includes among other things the study of screws, fastenings, shafting, belting, fly wheels, wheels, gearing, and machine frames.

Junior year; second semester; 4 credits; 3 recitations; 1 laboratory period. Text: Kimball and Barr, Machine Designs.

206. Machine Design. This course supplements and is directly dependent upon the recitation work of course 125.

The work is taken up from a practical point of view and applies such theory as is consistent with the approved methods of design. Designs and complete working drawings are made of machines.

Senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods. Text: Kimball and Barr, Machine Designs.
Text: Kimball and Barr, Machine Designs.

207. Machine Drawing and Design. A course in mechanical drawing involving the elementary principles of machine design.

Industrial Arts course; senior year; first semester; 3 credits; 1 recitation; 2 laboratory periods.

251. Statics and Dynamics. This is essentially a course in theoretical and applied mechanics. Force systems are analyzed and their effects upon rigid bodies, both at rest and in motion, are carefully studied. Methods of finding centers of gravity and moments of inertia are investigated, and their practical application is brought to the student's attention by solving a number of problems. The principles of work, energy, friction, and impact, are all studied with reference to their importance in the field of engineering.

Prerequisites: Differential and Integral Calculus, Math. 51, 52. All courses in Engineering; junior year; first semester; 5 credits; 5 recitations. Text: Hancock, Applied Mechanics for Engineers.

252. Strength of Materials. In this course the general principles of mechanics are applied to the elements of engineering structures to determine their strength and fitness.

Some of the features are tensile and crushing strength of different engineering materials; strength and stiffness of beams or girders under different systems of loading, and various methods of support; supporting power of posts or columns; the application of torsion to shafts as a means of transmitting power.

The work throughout is exemplified by numerous problems which the student is required to solve.

Prerequisite: Statics and Dynamics, M. E. 251. All courses in Engineering; junior year; second semester; 3 credits; 3 recitations. Text: Boyd, Strength of Materials.

254. Elementary Mechanics. A study of some of the general principles and applications of mechanics without the use of the calculus. The relations of force, mass, and velocity are discussed with special reference to their application in finding stresses in framed structures, and cables. Work, energy, and power are also briefly considered.

The course in Logging Engineering; senior year; second semester; 3 credits; 3 recitations.

302. Road Machinery. This course is designed to familiarize the student with the purpose, care, and manipulation of the different forms of power-driven road machinery, both steam and gas, as exemplified in modern road construction.

The course in Highway Engineering; senior year; first semester; 1 credit; 1 laboratory period.

310. The Practice of Engineering and Design. The application of cost analysis to practical engineering problems. The design of power plants with special reference to economy of investment and operation, together with a study in the choice of size of units for given load variation for best plant efficiency, growth and load factors, contracts, specifications, and the purchase and sale of equipment according to best American practice.

Primarily for graduates. **Prerequisite:** Power Plant Design, M. E. 323, must be taken in conjunction unless credit therein has already been obtained. Elective senior year. Three credits; 2 drawing periods and 1 recitation; second semester.

317. Heat Engines and Boilers. An elementary course in the fundamentals of steam and gas engines, boilers and auxiliaries, together with the principles of combustion.

Course in Logging Engineering; junior year; first semester; 2 credits; 2 recitations. Text: Allen and Bursley, Heat Engines.

318. Heat Engines and Boilers. A more advanced course than 317, covering the elements of thermodynamics, of steam and gas engines, turbines, boilers and power plant auxiliaries, together with the principles of combustion.

Course in Electrical Engineering; junior year; first semester; 3 credits; 3 recitations. Text: Allen and Bursley, Heat Engines.

319. Elements of Thermodynamics. A thorough study of the thermodynamics of perfect gases, gas cycles, and combustion, together with a study of fuels, furnaces, draft apparatus, boilers and boiler auxiliaries, and steam generation.

Prerequisite: Diff. and Int. Calc. Math. 51 and 52. Course in Mechanical Engineering; junior year; first semester; 3 credits; 3 recitations.

320. Thermodynamics. A continuation of course 319. A thorough study of the thermodynamics of vapors, steam engine cycles, together with a study of steam and gas engines, turbines, compressors, engine valve gear, governors and auxiliaries.

Prerequisite: Elements of Thermodynamics, M. E. 319. Course in Mechanical Engineering; junior year; second semester; 3 credits; 3 recitations.

321. Power Plant Engineering. A study in the choice and coordination of power equipment and its assembly, of foundations and buildings, and the combination of power plant machinery with other equipment, together with elementary cost study.

Prerequisite: M. E. 319 and 320. Course in Mechanical Engineering; senior year; first semester; 2 credits; 2 recitations. Text: Handbook M. E., also Cambria.

322. Power Plant Engineering. A more thorough study of the assembly of power plant machinery, foundations and building, elevating and conveying machinery, water treating plants together with a more advanced study of cost analysis.

Prerequisite: M. E. 321. Course in Mechanical Engineering; senior year; second semester; 2 credits; 2 recitations. Text: M. E. Handbook, also Cambria.

323. Power Plant Design. The complete design and layout of power plants, elevating and conveying machinery, foundations and buildings, alone and in combination with other machinery, in accordance with best practice, and from blue prints of actual power plants machinery as built by the best American manufacturers.

Courses in Mechanical Engineering; second semester; 3 credits; 3 laboratory periods.

325. Compressed Air and Refrigeration. A course devoted to the theory, design, and operation of air compressors, fans, and blowers, the first part of the semester, and to the study of the theory and operation of commercial refrigeration systems the latter part.

Prerequisite: M. E. 305. Elective in the senior year of the Mechanical and Electrical Engineering courses; first semester; 2 credits; 2 recitations. Text: Thorkelson, Air Compression and Transmission.

331. Heating and Ventilating. Study of modern methods for the heating and ventilating of buildings. An outline of the work includes a study of several approved systems of heating by means of steam, hot water, or air; methods of computing radiating surface; effective methods of ventilation; general design; construction, and operation of plant.

The course in Mechanical Engineering; senior year; second semester; 3 credits; 1 recitation; 2 laboratory periods. Text: Hoffman, Heating and Ventilation.

346. Internal Combustion Engines. A study of gas cycles and the losses in the actual engines. Consideration of the various types of engines and their adaptation in practice together with a close study of the value of the internal combustion engines as power producers, as compared with other prime movers.

Elective; senior year; either semester; 2 credits; 2 recitations. Text: Streeter, Internal Combustion Motors.

351. Seminar. The seminar meets once each week to study progress and development in the field of mechanical engineering. Technical literature will be reviewed; assignments will be made in advance, covering new or special features of engineering work. Students are required to submit carefully prepared reports, criticisms, or comments.

The course in Mechanical Engineering; senior year; first semester; 1 credit; 1 recitation.

352. Seminar. A continuation of course 351.

The course in Mechanical Engineering; senior year; second semester; 1 credit; 1 recitation.

A-1. Vocational Drawing. Similar to M. E. 151 except more stress is laid on the elementary principles, as the course is designed for students who have had no high-school training in drawing.

Vocational course; Mechanic Arts; first year; first semester; 2 credits; 2 laboratory periods. Fee \$0.50.

B-1. Vocational Drawing. A continuation of A-1.

Vocational course; Mechanic Arts; first year; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

A-2. Vocational Drawing. Continuation of B-1. As the student becomes competent he is given practical machine drafting on work through the shops, similar to that of M. E. 153.

First semester; 2 credits; 2 laboratory periods. Fee \$0.50.

B-2. Vocational Drawing. Continuation of A-2.

Second year; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

A-3. Vocational Drawing. Continuation of B-2.

Third year; second semester; 2 credits; 2 laboratory periods. Fee \$0.50.

B-3. Vocational Drawing. Continuation of A-3.

Third year; first semester; 2 credits; 2 laboratory periods. Fee \$0.50.

SCHOOL OF FORESTRY

GEORGE WILCOX PEAVY, Dean.

*JOHN POMEROY VAN ORSDEL, Professor of Logging Engineering.

HAROLD STEPHENSON NEWINS, Associate Professor of Forestry.
Instructor in Forestry.

ALUMNI ADVISORY COMMITTEE

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Oregon is the foremost timber state in the Union. Of the standing timber remaining uncut in the United States fully twenty percent is within the boundaries of the State of Oregon. According to the best available estimates, this stumpage aggregates approximately 538 billion feet, board measure. Over 11 million acres of timber land, carrying 404 billion board feet of timber are privately owned and 13 million acres, carrying 134 billion board feet, are in the National Forests. The timber in private hands is being cut as the interest of the owners direct. That in public ownership is being sold according to the requirements of the local markets. All National Forest timber is for sale.

This dual ownership of timber opens up two fields. The first is distinctly that of harvesting an immense crop of mature timber. Under the present system of taxation and with the prevailing rates of interest, private enterprise cannot profitably grow timber. The interest of the private owner is largely at an end with the removal of the standing timber. The work of harvesting the timber crop is the sphere of the logging engineer. The domain within the National Forests is dedicated to the production of timber for all time. It is the policy of the Forest Service to restock the cutover areas and to plant all denuded areas which are capable of growing timber. The planting, growing, and protecting of timber crops is the special field of the technical forester.

The Profession of Logging Engineering. The profession of logging engineering is of recent development. In the past, low prices for standing timber, easy logging, and high prices for lumber have made profits to the lumberman sure, and these same conditions have not demanded economy in operation. With high-priced stumpage, timber difficult of access, and low prices for lumber,

* On leave for the year 1918-19.

a revolution in the entire lumber industry is being forced. It has become a case of economy in operation or financial failure. Bringing the logs over rough country to the mill involves many engineering problems. Among these are the construction of logging railroads, the installation of efficient sky-line and ground logging devices, and the operation of special steam and electrical logging equipment. The course in Logging Engineering is designed to equip young men to be of use in this field. The course as outlined in this catalogue was prepared under the direction of some of the ablest timbermen in the Pacific Northwest, and the strictly technical subjects in the course are taught by one of the foremost logging engineers in the United States.

Advantages of the West. The forests of the United States are in the West. In this region the student of forestry is in immediate contact with the conditions he is studying. Oregon alone has 24 million acres of forest land. The greater part of this acreage is west of the Cascade Mountains and consequently easily accessible from the College at Corvallis. Thus, an immense laboratory for observation and field work is at the very doors of the School of Forestry. In the spring of each college year students in both forestry and logging engineering go out on some timber tract for a period of two weeks of practical field work. The men are divided into small crews and an area of several thousand acres of timber is carefully surveyed, cruised, and mapped under the supervision of experienced men. Advanced students make special trips for the purpose of studying the various types of logging and milling operations. Some of the largest sawmills in the world are but two hours travel from the College. Pulp mills, wood distillation plants, box and furniture factories are easily accessible. In addition to this, summer work in the forests or in logging camps is easy to obtain, and is expected of all forestry and logging students. All this points to the fact that Oregon is the ideal place to study general forestry and logging engineering.

Forestry work in this country is yet in its infancy; but it is developing rapidly. When the full economic importance of our forest resources is understood, more intensive methods will be required and many times the number of men now employed will be needed. The Forest Service is steadily raising the requirements for admission to its ranks. Nontechnical men who cannot meet the new requirements are naturally retired. The field for the technically trained man is consequently becoming broader. The

State, too, is feeling the need of trained men in forest-protection work. As time goes on this field will be more extensive.

The work in both branches of forestry, that is, in general forestry and in logging engineering, is in charge of technically trained men, all of whom have had practical experience in their respective lines of work. In neither course, however, are technical subjects permitted to crowd out other subjects requisite in an education. The logging engineer and the forester are prepared for citizenship by courses in sociology, political economy, state and local government, tax and labor problems, and other kindred subjects. The fact that the professional man should be prepared for leadership in his community, as well as for success in his chosen work, is always kept clearly in view.

To give those students who so desire an opportunity to secure a broader foundation in subjects basic to logging engineering, as well as to provide time for cultural work and advanced professional training, a five-years course in logging engineering is offered for the first time.

Equipment. The School of Forestry is now provided with suitable space in which to do its work. A three story building, eighty feet wide and one hundred and thirty-six feet long, has been constructed to house the work of the school. This building contains roomy laboratories for work in silviculture, dendrology, mensuration, forest protection, timber technology, drafting, timber grading, and logging devices and equipment. Through the kindness of the manufacturers of logging equipment and lumber manufacturing concerns, much valuable material has been assembled for demonstration purposes.

In addition to the laboratories, class rooms, and offices, space is devoted to a collection of manufactured wood products, designed to show the various uses to which wood may be put, and to educate students in the proper utilization of Oregon's greatest natural resource. All available publications dealing with general forestry, logging, or lumber manufacture are provided for the use of students.

The Forest Club. This is an association of students and instructors "formed for the purpose of promoting the forestry interests of the State." In order to carry out its purposes, it meets twice each month. The first meeting of each month is purely of a social nature, with each alternate meeting for the discussion of current forestry literature, magazine articles, news

items, legislation, and general progress movements pertaining to forests, forest service, forest products, forest industries, lumbering, and the lumber trade.

DEGREE COURSE IN GENERAL FORESTRY

The following subjects are recommended for students who desire to work for a degree in general forestry. For graduation the College requires the student to complete 136 credit hours. Of this number he is expected to take 60 hours of professional work, 25 hours of science, and 6 hours in mathematics. The balance of the required 136 hours may be made up of subjects outlined in the recommended course or of those approved by the Dean of the School. Only in exceptional cases will the outlines for the freshman and sophomore years be modified.

Freshman Year	Semester	
	1st	2nd
Modern English Prose (Eng. 85, 86).....	2	2
Trigonometry (Math. 14).....	3	
Elementary Analysis (Math. 34).....		3
General Forestry (For. 101, 102).....	3	2
Elementary Mensuration (For. 304).....		3
Plane Surveying (C. E. 234).....		3
General Chemistry (Chem. 100, 101).....	3	3
Forest Geology (Min. 161).....	3	
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....	$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1,2).....	1	1
First Aid (Phys. Ed. 23).....	1	
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Sophomore Year	Semester	
	1st	2nd
Blacksmithing (Ind. Arts. 151).....		2
General Physics (Phys. 1, 2).....	3	3
Mensuration (For. 305).....	3	
Topographic Surveying (C. E. 235).....	3	
Silviculture (For. 201, 202).....	3	3
Forest Botany (Bot. 30, 31).....	3	3
Forest Protection (For. 505).....		3
Elementary Forest Mapping (For. 303).....		2
Gymnasium (Phys. Ed. 17, 18).....	½	½
Drill (Military 3, 4).....	1	1
	<hr/> 16½	<hr/> 17½

Junior Year

National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Mensuration (For. 301).....	5	
Log Scaling (For. 307).....		2
Identification of Woods (For. 508).....		3
Forest Entomology (Ento. 304).....		3
Advanced Silviculture (For. 203, 204).....	3	2
Elementary Economics (Com. 210).....	3	
Forest History and Economics (For. 103).....		3
Uses of Wood (For. 507).....	2	
Military Science (Theo. Inst. 1, 2).....	1	1
Military Drill (Military 5, 6).....	1	1
	<hr/> 18	<hr/> 18

Senior Year

Forest Finance (For. 401).....		4
Economics of Lumber Industry (For. 403).....	4	
Dendrology (For. 501).....	5	
Lumbering Management (For. 407).....		4
Forest Improvement (For. 405).....	3	
Timber Technology (For. 502).....		4
Timber Testing (Exp. E. 238).....		1
Forest Appraisals and Reports (For. 306).....	3	
Seminar (For. 408, 409).....	1	1

	Suggested Electives	Semester	
		1st	2nd
Dendrology (For. 503).....			3
Forest Pathology (Bot. 37).....			1
Economic Zoology (Zool. 108, 109).....	3		3
Labor Problems (Com. 213).....			3
Range and Pasture Botany (Bot. 36).....	3		

DEGREE COURSE IN LOGGING ENGINEERING

(Four-Years Course)

The following subjects are recommended for those students in logging engineering who desire to devote the customary four years to their college course. For graduation the College requires the student to complete 136 credit hours. Of this number he is expected to complete 60 hours in professional work, 10 hours in general science, 10 hours in mathematics, and the balance of the required 136 hours in the general subjects as outlined or as approved by the Dean of the School. Only in exceptional cases will the outlines for the freshman and sophomore years be modified.

	Freshman Year	Semester	
		1st	2nd
Modern English Prose (Eng. 85, 86).....	2	2	
Trigonometry, College Algebra (Math. 11, 21).....	5		
Elementary Analysis (Math. 31).....			5
Chemistry (Chem. 100).....	3		
General Forestry (For. 101, 102).....	3		2
Plane Surveying (C. E. 234).....			3
Elementary Mensuration (For. 304).....			3
Wood Working (Ind. Arts 110, 111).....	2		2
Library Practice (Libr. 1).....		$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....		$\frac{1}{2}$	
Gymnasium (Phys. Ed. 15, 16).....		$\frac{1}{2}$	$\frac{1}{2}$
Drill (Military 1, 2).....	1		1
		<hr/>	<hr/>
		17½	18½

	Semester	
	1st	2nd
Sophomore Year		
Engineering Physics (Phys. 101, 102).....	4	4
Topographic Surveying (C. E. 235).....	3	
Mensuration (For. 305).....	3	
Blacksmithing (Ind. Arts 151).....		2
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind. Arts 202).....		1
Railroad Surveying (C. E. 274).....		4
Silvics (For. 205).....	3	
Tree Identification (For. 206).....		4
Principles of Economics (Com. 210).....	3	
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Junior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Adv. Mensuration (For. 301).....	5	
Log Scaling (For. 307).....		2
Advanced Forest Mapping (For. 317).....	2	
Logging Machine Design (For. 316).....		2
Efficiency Systems (For. 313).....		2
Timber Technology (For. 502).....		4
Timber Testing (Exp. E. 238).....		1
Heat Engines and Boilers (M. E. 317).....	2	
Steam Laboratory (Exp. E. 255).....	1	
Uses of Wood (For. 507).....	2	
Identification of Woods (For. 508).....		2
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
	<hr/>	<hr/>
	17	18

	Semester	
	1st	2nd
Senior Year		
Economics of Lumber Industry (For. 403).....	4	
Forest Finance (For. 401).....		4
Topographic Logging Plans (For. 308).....	4	
Logging Devices and Equipment (For. 604, 605).....	4	4
Lumbering Management (For. 407).....		4
Logging Railroads (For. 601).....	4	
Logging Methods (For. 315).....		2
Forest Appraisals and Reports (For. 306).....	3	
Mechanics (M. E. 254).....		3
	19	17

DEGREE COURSE IN LOGGING ENGINEERING (Five-Years Course)

Due to the complex character of the work demanded of the logging engineer, and to the desire on the part of many of those who are preparing for the profession for a broader training both in fundamental and general cultural subjects, a five-years course leading to the degree of Logging Engineer is offered for the first time. Students who complete the first four years of this course will receive the degree of Bachelor of Science in Logging Engineering. Those who complete the full five-years course, and who receive the recommendation of the Dean of the School and the head of the department of Logging Engineering, will be granted the graduate degree of Logging Engineer.

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 85, 86).....	2	2
Trigonometry, College Algebra (Math. 11, 21).....	5	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 100).....	3	
General Forestry (For. 101, 102).....	3	2
Plane Surveying (C. E. 234).....		3
Elementary Mensuration (For. 304).....		3
Wood Working (Ind. Arts 110, 111).....	2	2
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....	$\frac{1}{2}$	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
	17 $\frac{1}{2}$	18 $\frac{1}{2}$

	Semester	
	1st	2nd
Sophomore Year		
Differential Calculus (Math. 51).....	4	
Engineering Physics (Phys. 101, 102).....	4	4
Blacksmithing (Ind. Arts 151).....		2
Topographic Surveying (C. E. 235).....	3	
Mensuration (For. 305).....	3	
Toolmaking and Tempering (Ind. Arts 152).....		1
Machine Shop (Ind. Arts 202).....		1
Railroad Surveying (C. E. 274).....		4
Silvics (For. 205).....	3	
Tree Identification (For. 206).....		4
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/>	<hr/>
	18 $\frac{1}{2}$	17 $\frac{1}{2}$

Junior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Principles of Economics (Com. 210).....	3	
Advanced Mensuration (For. 301).....	5	
Log Scaling (For. 307).....		2
Adv. Forest Mapping (For. 317, 318).....	2	2
Logging Machine Design (For. 316).....		2
Uses of Wood (For. 507).....	2	
Identification of Woods (For. 508).....		2
First Aid (Phys. Ed. 24).....		1
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Mil. 5, 6).....	1	1
Elective		3
	<hr/>	<hr/>
	17	17

	Senior Year	Semester	
		1st	2nd
Advanced Commercial Law (Com. 309).....		3	
Cost Accounting (Com. 150).....		3	
Economics of Lumber Industry (For. 403).....		4	
Forest Finance (For. 401).....			4
Elementary Mechanics (M. E. 254).....			3
Heat Engines and Boilers (M. E. 317).....	2		
Steam Laboratory (Exp. Eng. 255).....	2		
Elements of Electrical Machines (E. E. 403, 406).....	3		3
Efficiency Systems (For. 313).....			2
Timber Technology (For. 502).....			4
Timber Testing (Exp. Eng. 238).....			1
		—	—
		17	17

Graduate Year

Logging Railroads (For. 601).....	4	
Advanced Logging Railroads (For. 606).....		4
Topographic Logging Plans (For. 308).....	4	
Logging Devices and Equipment (For. 604, 605).....	4	4
Lumbering Management (For. 407).....		4
Lumber Manufacture (For. 602).....	2	
Logging Methods (For. 315).....		2
Forest Appraisals and Reports (For. 306).....	3	
Special Problems		2
	—	—
	17	16

Suggested Electives

Forest Mapping (For. 303).....	2	
Commercial Lectures (For. 411).....	1	
Labor Problems (Com. 213).....		3
Forest Protection (For. 505).....		3

SUGGESTED SHORT COURSE SUBJECTS

Forest Protection (For. A, B).....	3	3
Forest Measurements (For. C, D).....	3	3
Forest Surveying and Mapping (For. E, F).....	3	3
Forest Improvements (For. G, H).....	3	3
Forest Administration (For. K, L).....	1	1
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	13	13

The following courses are offered:

101. General Forestry. The responsibility of the nation in the conservation of its natural resources. The vital interest of the nation in its timber, coal, iron, water, etc. Appropriate methods of insuring longest and best use of these natural resources.

Forestry; freshman year; first semester; 3 credits; 3 lectures; 3 recitations. Reference text: Van Hise, Conservation of Natural Resources.

102. General Forestry. Preliminary survey of the whole field of forestry. Forest regions of the United States and the commercial trees native to those regions. Forest ownership, private, state, and national. Elements of state and national forest policy. Economic importance of the forests of the state and nation.

Forestry; freshman year; second semester; 2 credits; 2 lectures; 2 recitations. Reference text: Moon and Brown, Elements of Forestry.

103. Forest History and Economics. The development of European forestry. Progress of American forestry. The economic importance of forest products. Transportations as affecting the lumber industry.

Forestry; junior year; second semester; 3 credits; 3 lectures; 3 recitations. Reference text: Fernow, Economics of Forestry.

201. Silviculture. The art of establishing, developing, and reproducing trees, including their life-history, influences, modification, and growth. Forest description, covering general problems. Silviculture systems of cutting, such as, selection, clear cutting, and coppice. Marking trees for various cuttings. Silvicultural management.

Forestry; sophomore year; first semester; 3 credits; 1 lecture period of three hours; 1 field period of three hours. Reference text: Graves, Handling of Woodlands. Fee \$1.50.

202. Silviculture. The improvement of woodlands; clearings; thinnings; damage cuttings. Protection as related to silviculture. Forestation, including seed production, seed collection, seed preservation, and seed testing. Natural versus artificial regeneration. Nursery Practice. Planting. Afforestation.

Prerequisite: Forestry 201. Forestry; sophomore year; second semester; 3 credits; 2 lectures; 1 field period of three hours. Reference text: Graves, Handling of Woodlands. Fee \$1.50.

203. Advanced Silviculture. The practice of forestry in each silvicultural region of the United States, including study of physiography, management, protection, types, silvical characteristics of important species, and market relations. Forest ecology, dealing with the reciprocal relations between trees and forests and their environment, including a study of types and their classification, forest formations, climatic characteristics, soils investigations, antecology, sinecology, and ecological experiments.

Prerequisite: Forestry 201 and 202. Forestry; junior year; first semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.50.

204. Advanced Silviculture. Silvics, including the measure of tolerance, study of sample plots, economic possibilities of species, and reproduction characteristics. Each student will be required to make a detailed silvical study of some definite forest tract and present a thesis covering the work.

Prerequisites: Forestry 201, 202, and 203. Forestry; junior year; second semester; 2 credits; 1 recitation; 1 laboratory period. Fee \$1.50.

205. Silvics. Influence of the forest on stream flow and climate. Geographical and local distribution of trees by species. Tree reproduction. Tolerance. The relationship between trees and their environment.

Logging Engineering; sophomore year; first semester; 3 credits; 2 lectures; 1 field period. Fee \$1.50.

206. Tree Identification. Field characteristics and classification of timber trees of United States, their commercial range, local occurrence, size, growth, form, climatic soil and moisture requirements, resistance, relative tolerance and reproduction. The fundamental purpose of this course is to teach the student to know commercial timber trees.

Logging Engineering; sophomore year; second semester; 4 credits; 3 lectures; 1 field period. Reference text: Sudworth, Trees of the Pacific Slope. Fee \$1.50.

301. Advanced Mensuration. Log rules. Scaling of logs in board feet. Cord measure. Amount of timber required to make 1000 shingles. Shingle bolts, and units of measures used by all by-products. Piling specifications and values compared with other products. Making of volume tables and form factor tables for timber estimating purposes. Growth studies. Volume growth per-

cent. Yield tables. Complete valuation surveys including application of methods learned in connection with forest appraisals in course 304 and 305 to areas of timber land. Comparison between values derived in logging and mill cuts and estimates of standing timber. Field work at the mills and in the woods. Each student is required to assist in making a complete valuation survey and in preparing a complete report on a given piece of timber. Advanced work in the execution of topographic surveys on timbered areas. Costs of such work.

Prerequisites: For. 304 and 305, C. E. 234 and 235. General Forestry and Logging Engineering; junior year; first semester; 5 credits; 3 recitations; 2 field periods of three hours each. Reference text: Graves, Forest Mensuration. Fee \$2.00.

303. Forest Mapping. Drill in the detail of Forest mapping. Forest Service plain lettering and conventional signs. Use of contour and road pens, ruling pen, cross section liner, pantograph, and lettering gauges. Crayon and ink coloring in Forest Service and other standard legend. Making of final reconnaissance and land classification maps.

Forestry; elective; freshman year, second semester; sophomore year, first semester; 2 credits; 2 laboratory periods. Fee \$2.00.

304. Elementary Mensuration. Use of instruments employed in cruising timber; aneroid and barograph, box compass, jacob staff compass, Locke hand level, Abney hand level, Forest Service topographic hand level, trail tapes, etc. Cavalry sketching board. Principles and practice of pacing. Standardizing pace to all kinds of ground. Methods of covering ground in making timber appraisals, both in Forest Service and commercial timber holdings. History and theory of surveying public lands. Federal rectangular survey system. Private land grant boundary. Donation land claims. This last to be confined to a foundation on which the field work will be built. British Columbia land laws and methods of surveys. Mexican land grants. South American land laws and grants.

General Forestry and Logging Engineering; second semester; 3 credits; 2 recitations; 1 three-hours field period. Text: U. S. Manual of Public Land Surveys. Fee \$2.00.

305. Mensuration. The use of Forest Service and other hypsometers, Biltmore stick, Forest Service cruisers' sticks, calipers, diameter tape. Methods of estimating and measuring heights

and diameters of trees without special instruments. Topographic surveying of forested areas. Keeping field notes. Approved methods of traversing. Practice in surveying with aneroid barometer with the use of barograph as a checking instrument. Combination of methods. Execution of public land surveys. Retracing surveyed lines. Section subdivisions. Re-establishing obliterated corners. British Columbia, Mexican and South American surveys. Photographic surveys. Costs.

Prerequisites: For. 304 and C. E. 234. General Forestry and Logging Engineering; sophomore year; first semester; 3 credits; 1 recitation; 2 three-hours field or laboratory periods. Fee \$2.00.

306. Forest Appraisals and Reports. Commercial timber land examinations as made by commercial cruising companies. Cruising methods required by bonding companies, bankers, purchasers and operators. Preparation of the report which should cover such examinations. The various cruising methods and their relative merits. In this course the student will be required to work out and report on a problem which will be of practical value to some logging concern.

Prerequisite: For. 301. Logging Engineering; senior year; first semester; 3 credits; 2 lectures; 1 field or laboratory period of three hours. Fee \$3.00.

307. Log Scaling. Log Scaling as practiced in the United States generally and in the Pacific Northwest and in British Columbia in particular. The theory of board measure and the merits and demerits of the different scale rules. Allowances for log defect. The keeping of records. Scaling with reference to log grades as practiced on the Pacific Coast in different kinds of timber. Rules governing the sale of logs in different districts. Rules of log scaling and grading bureaus. Students will be required to scale at mills and logging camps. Laws governing scaling.

Prerequisites: Forestry 304 and 305. General Forestry and Logging Engineering; junior year; second semester; 2 credits; 1 lecture; 1 field period of three hours. Fee \$1.50.

308. Topographic Logging Plans. Plans for logging operations. Students will be required to make a topographic map of a timbered area. The timber will be cruised and a complete set of plans worked out, showing the proper location of the main line logging railroads, railroad spurs, rollways or landings, pole roads,

swing settings, logging area lines. An estimate will be made of the cost of logging the tract.

Prerequisites: For. 301 and C. E. 235. Logging Engineering; graduate year; first semester; 4 credits; 2 recitations; 2 field periods of three hours each. Fee \$4.00.

313. Efficiency Systems. General discussions of efficiency systems. Special application to the lumber industry. Cost-keeping systems and their comparative values. Organization. Cost keeping versus bookkeeping. Bonus, merit, profit-sharing, and piece systems. Labor problems as applied to the logging industry. Present-day labor management as practiced in modern logging operations.

Logging Engineering; senior year; second semester; 2 credits; 2 lectures.

315. Logging Methods. The yarding, skidding, and loading of logs by all known methods. Falling and bucking of timber. The relative merits of various methods will be considered. All known methods of handling timber from the standing tree to the mill will be discussed, not only with regard to Northwestern methods but methods used all over the United States and Canada.

Logging Engineering; graduate year; second semester; 2 credits; 2 lectures.

316. Logging Machine Design. Designing logging equipment, tools and rigging. Instruction in the preparation of working plans for machine shop and foundry construction. Students will make a set of drawings of standard woods tools and railroad equipment which are constructed in mill and camp shops.

Prerequisite: For. 317. Logging Engineering; junior year; second semester; 2 credits; 2 laboratory periods of three hours each. Fee \$2.00.

317. Advanced Forest Mapping. A course in the method and construction of relief maps made from topographical data obtained by each student in the field; a study of their use in planning logging operations and value of the same for such purposes. Costs of constructing relief maps. Free-hand field sketching. Drill in lettering and finishing maps.

Prerequisites: For. 301 and 303. Logging Engineering; junior year; first semester; 2 credits; 1 laboratory period; 1 field period of three hours each. Fee \$2.00.

318. Advanced Forest Mapping. A continuation of course 317.

Logging Engineering; junior year; second semester; 2 credits; 1 laboratory period; 1 field period. Fee \$2.00.

401. Forest Finance. Investments and costs in forest production. The value of forest property for destructive lumbering. Value of forest property for continued timber production. Appraisal of damages due to the destruction of forest property. Forest taxation. Stumpage values. Comparison of forest values with agricultural values.

Forestry; senior year; first semester; 4 credits; 4 lectures; 4 recitations. Reference text: Chapman, Forest Valuation.

403. Economics of the Lumber Industry. A brief history of lumbering in the United States. Stumpage prices. Prices of manufactured lumber. Shifting centers of production. Transportation. Freight rates. The Inter-State Commerce Commission and the lumber industry. Substitutes and their effects. Lumbermen's Associations. Present rate of consumption and the future supply. Function of the government in the future of the industry.

General Forestry and Logging Engineering; senior year; first semester; 4 credits; 4 lectures.

405. Forest Improvements. A study of the planning, construction, and maintenance of the permanent improvements essential to the protection, administration, and use of a forest. Also the keeping of cost data for future estimating and supervision. Transportation improvements: roads, trails, bridges, and signposts. Communication improvements: telephones, heliographs, wireless. Protective improvements: lookout stations; fire lines, tool caches. Quarters improvements: houses, cabins, barns, sheds, fences, water supply, drainage systems.

Forestry; senior year; first semester; 3 credits; 2 recitations; 1 laboratory period.

406. Field Work. This course is based upon practical work performed by the student between the sophomore and junior years or between the junior and senior years. The work must be done on some modern logging operation or in connection with some technical forestry work carried on by the State or by the Forest Service. A report based upon an approved outline must be submitted.

Forestry; junior or senior year; from 1 to 5 credits.

407. Lumbering Management. A series of lectures dealing with the lumber industry from the manager's standpoint. Trade, selling grades, and utility will be considered. Major accounting of interest to the manager. Lumber associations, bonds, taxation. Lumber rates and tariffs. Rate zones, control by Inter-State Commerce Commission. Rates by rail and water. Low towage.

Logging Engineering; graduate year; second semester; 4 credits; 4 lectures.

408. Seminar. Preparation and discussion of reports of special subjects. Current forestry and lumbering literature. Each student is required to prepare a report on some assigned subject.

Forestry; senior year; first semester; 1 credit.

409. Seminar. Continuation of course 408.

Forestry; senior year; second semester; 1 credit.

411. Commercial Lectures. A series of lectures by men engaged in the various phases of the lumber industry.

Forestry; elective; junior and senior years; second semester; 1 credit; 1 lecture period.

501. Dendrology. Classification and identification of forest trees, including a study of forest ecology and taxonomy. The silvical characteristics of commercial species. Life-history and requirements of trees.

Forestry; senior year; first semester; 5 credits; 3 recitations; 2 laboratory periods. Reference texts: Sudworth, Trees of the Pacific Slope. Sargent, Trees of North America. Fee \$2.00.

502. Timber Technology. Fundamental principles underlying the seasoning and kiln drying of woods. Kiln-drying methods and their relative merits. Preservative treatment of timber, methods and results. Manufacture of wood pulp. Production of fiber products. Manufacture of alcohol, turpentine, resin, tar, and other chemical products from wood. Closer utilization of wood waste. Grading rules for the various kinds of manufactured wood products.

General Forestry and Logging Engineering; senior year; second semester; 4 credits; 2 lectures; 2 laboratory periods. Fee \$3.00.

503. Advanced Dendrology. A continuation of course 501.

Forestry; senior year; elective; second semester; 3 credits; 2 recitations; 1 laboratory period. Fee \$1.50.

505. Forest Protection. Protecting the forests from fire, insects and fungi. The course deals primarily with protection from

fire, laying emphasis on preventive methods such as sentiment making; laws, both state and federal; patrol; and the reduction of risk by slash disposal; fire lines; grazing, etc. Planning an adequate fire-fighting system in all its scientific phases. The business of fire fighting, including discovery, communication, transportation to fire, equipment, organization and work done. Federal, state, and private fire-control organizations.

Forestry; sophomore year; second semester; 3 credits; 3 recitations. Fee \$1.00.

506. Commercial Woods. The course is designed primarily to meet the requirements of the woodworker in choosing the species of wood best adapted to his needs, and in identifying the wood commonly used. Macroscopic and microscopic identification of different species. Dendrology and its significance in wood technology. Taxonomy, showing how trees are classed.

Industrial Arts; junior year; first semester; 2 credits; 1 lecture; 1 laboratory or field period. Reference texts: Noyes, Wood and Forest. Kellogg, Lumber and Its Uses. Fee \$2.00.

507. Uses of Wood. Study of wood structure and the adaptation of the wood to commercial uses. The chief wood-using industries and the relative amounts of the principal commercial species used annually. Adaptation of wood to special purposes. The substitutes for wood. Minor uses of wood such as pulp, fiber board, etc. By-products.

General Forestry and Logging Engineering; junior year; first semester; 2 credits; 1 lecture; 1 laboratory period. Reference text: Kellogg, Lumber and Its Uses. Fee \$2.00.

508. Identification of Wood. Identification of all the important commercial woods. Special emphasis is placed on the woods of the Pacific Northwest. Physical and structural properties. All woods in the vicinity of the School are collected during field trips and later prepared in the laboratory for microscopic examination. At the conclusion of the course a key to the identification of these woods is required.

Logging Engineering; junior year; second semester; 2 credits; 1 lecture; 1 field or laboratory period. Reference text: Record, Economic Woods. Fee \$2.00.

601. Logging Railroads. Railroads especially adapted to logging operations. Difference between logging railroads and common-carrier railroads. Grades. Alignment. Railroad operation as applied to the logging railroads. Economic theory of location and

construction. Structures and materials used in logging railroads. Costs of surveys, construction, operation and maintenance.

Prerequisite: C. E. 274. Logging Engineering; graduate year; first semester; 4 credits; 2 lectures; 1 field and 1 laboratory period of three hours each. Reference text: Welbroughton, Economic Theory of Railway Location. Fee \$4.00.

602. Lumber Manufacture. Discussion of the various types of modern mills. Manufacture of secondary products: Electrical versus steam mills. Lumber handling devices. Examinations of up-to-date mills and reports on them will be made.

Logging Engineering; graduate year; first semester; 2 credits; 1 lecture; 1 laboratory period.

604. Logging Devices and Equipment. Flume and chute construction. Rigging. Types of railroad locomotives, logging cars and trucks. Donkey engines. Skidding and loading devices. Camp buildings, shops, dwellings. Machine shop machinery and tools. Woods tools. Railroad track equipment and fixtures. Oil, grease, packing and waste. Water supply systems. Explosives. Construction equipment. Boilers, aerial tramways, snubbing devices. Incline railroads.

Logging Engineering; graduate year; first semester; 4 credits; 2 lectures; 2 laboratory periods of three hours each. Fee \$4.00.

605. Logging Devices and Equipment. A continuation of course 604. Blocks and hooks, log flumes, wire rope, logging dams, electrical machines used in logging. Detailed investigation of costs and makes of equipment. Aerial and high lead systems. Economic value of using efficient equipment.

Logging Engineering; graduate year; second semester; 4 credits; 2 lectures; 2 laboratory periods of three hours each. Fee \$4.00.

606. Advanced Logging Railroads. A continuation of course 601. Bridge and tunnel construction. Economics of construction and railroad operation. Economics of railroad motive power, rolling stock and other materials. Railroad management and financing.

Prerequisite: For. 601. Logging Engineering; graduate year; second semester; 4 credits; 3 lectures; 1 laboratory period. Fee \$4.00.

SHORT COURSE SUBJECTS IN GENERAL FORESTRY

A. Forest Protection. Causes of forest fires. The methods of controlling forest fires. The proper organization of fire patrol over definite areas. Fire fighting devices. Lookout stations, telephone lines, roads and trails, with reference to fire control. Different methods applicable to different regions.

Forester's Short Course; first semester; 3 credits; 3 recitations.

B. Forest Protection. A continuation of course A.

Forester's Short Course; second semester; 3 credits; 3 recitations.

C. Forest Measurements. The fundamental principles involved in computing the solid contents of logs and trees. Method of construction scale rules. Height measures. Forest Service methods of cruising timber. Other methods. Discounts for defects. Volume tables. Practical demonstrations in the woods.

Forester's Short Course; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

D. Forest Measurements. A continuation of course C.

Forester's Short Course; second semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

E. Forest Surveying and Mapping. A study of the United States system of land surveys. Retracing surveyed lines. Methods employed in marking surveyed lines. The use of the compass; the surveyor's chain; plane table, Abney hand level. Practical field work in surveying. The use of the aneroid barometer in topographic surveying. The details of map making. Conventional signs used in mapping.

Forester's Short Course; first semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

F. Forest Surveying and Mapping. A continuation of course E.

Forester's Short Course; second semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$1.00.

G. Forest Improvements. The construction of roads, trails, telephone lines, lookout stations, bridges, cabins, etc., costs.

Forester's Short Course; first semester; 3 credits; 2 recitations; 1 laboratory period.

H. Forest Improvements. A continuation of course G.

Forester's Short Course; second semester; 3 credits; 2 recitations; 1 laboratory period.

K. Forest Administration. The organization of the Federal Forest Service. The District Office. The National Forest. The State Forester's office. Organization of the State work. Forms used in the transaction of forest business. The preparation of reports.

Forester's Short Course; first semester; 1 credit; 1 recitation.

L. Forest Administration. A continuation of course K.

SCHOOL OF HOME ECONOMICS

AVA BERTHA MILAM, Dean

The School of Home Economics offers the following courses of study: a graduate course leading to the degree of Master of Science, with majors in the departments of Household Science, Household Art, House Administration, Institutional Management, Applied Design, and Education; three four-years courses, each of which leads to the degree of Bachelor of Science; a two-years course for dietitians; a one-year homemaker's course; elective courses for students in other schools of the College; a four-weeks course in food studies, dressmaking, textiles, etc., which is offered in connection with the Winter Short Course; and a six-weeks course for teachers, offered in connection with the work of the Summer School.

Fundamentally, the young women in the School of Home Economics are offered such training as will help them to be prepared to adjust themselves readily to their environment. That the young women completing this work may be good citizens as well as good homemakers, good business managers in their homes, as well as good cooks, broadly educated women, as well as specially trained workers, the courses of study in the School of Home Economics have been planned to give a liberal as well as a technical education.

Opportunities for teaching Home Economics, not only in high schools and colleges, but as supervisors in the common schools of cities, and in the consolidated community schools of progressive rural communities, are becoming more general and more desirable. Facilities for specializing in this work at the College are therefore given special attention. Many opportunities are open to the women capable of solving the problems of good food service for large numbers of people, and for experts in the management of large institutions. Equally attractive opportunities are available for the expert needlewoman, the tasteful designer of gowns, the competent dressmaker or milliner, the ladies' tailor, and the woman with artistic resources as a household decorator and furnisher.

More and more the life of the modern community is dependent upon institutions. Women are rapidly taking their places as executive and administrative leaders in the important functions of these institutions. Hospitals, Institutional Homes, Educational

Institutions, and Social Centers, are increasingly demanding the services of women of skilled technical accomplishments. There is a growing demand for dietitians in hospitals and large institutions, in the Red Cross service, and as managers of cafeterias and tea rooms. The training in dietetics, catering, and management offered the young women at the College through the School of Home Economics, assists in the liberal and practical preparation for this employment. The textile and clothing courses, together with art and science training, give a good foundation for various lines of laboratory, research, testing, and inspecting work.

With the establishment of the College Practice House, House Administration is being more effectively taught than was formerly possible without this equipment. This year a new course in Institutional Management will be offered for the first time, giving practice in the organization, equipment, and management of a fifty-unit dining room. Students trained in such a course should be able easily to adapt themselves to institutions of larger units. Practical work is also given in the housekeeping department of the women's dormitories where the problems of planning, equipping, and management of larger institutions are studied.

Quartered in a new building, provided with a thoroughly practical modern heating, ventilating, and sanitary system, and equipped with the most approved facilities for conducting the work of the various departments, the School of Home Economics is in a very fortunate position for making its courses of the utmost value to its patrons—not only to its resident students, but to the communities of the State at large wherever its extension activities may penetrate.

REQUIREMENTS FOR GRADUATION IN THE SCHOOL OF HOME ECONOMICS

In order to secure the degree in Home Economics, a minimum of 132 college credits must be completed. The subjects required in the Freshman and Sophomore years are prescribed. The subjects for the Junior and Senior years are in part prescribed, and the remaining credits elected.

DEGREE COURSES IN HOME ECONOMICS

Candidates for the degree of Bachelor of Science in Home Economics will pursue one of the prescribed group courses for the first two years. The Freshman and Sophomore years of these courses are similar; but at the beginning of the Junior year the courses begin to differentiate in the direction of the aim of each course. The Junior and Senior years allow electives from the several groups of studies in Home Economics and from other schools and departments in the College.

Group I (a) comprises courses that offer to women the opportunity to prepare themselves to become teachers of Household Science and Art, extension workers, or institutional managers. The first two years, as prescribed, give the necessary foundation for any one of these occupations; the Junior and Senior years are in part elective, a fact which provides for specialization in any one of these departments.

	Semester	
	1st	2nd
Freshman Year		
General Chemistry, (Chem. 102, 103).....	3	3
Textiles and Clothing, (H. A. 104, 105).....	4	4
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32).....	3	3
Principles of Botany, (Bot. 24).....		2
Library Practice, (Libr. 1).....	$\frac{1}{2}$	
Hygiene, (Phys. Ed. 10).....	$\frac{1}{2}$	
Survey of Home Economics, (H. S. 50).....	1	
Gymnasium, (Phys. Ed. 5, 6).....	1	1
	<hr/> 15	<hr/> 15
Sophomore Year		
Organic Chemistry; Chemistry of Foods (Chem. 200, 402).....	4	4
Foods and Cookery, (H. S. 106, 107).....	4	4
Design and Color, (Art 204).....	2	
Household Physics, (Phys. 133, 134).....	2	2
Household Bacteriology, (Bact. 304).....		3
Modern Language.....	3	3
Gymnasium, (Phys. Ed. 7, 8).....	1	1
	<hr/> 16	<hr/> 17

SUGGESTED COURSE FOR MAJOR IN HOUSEHOLD ARTS

Junior Year	Semester	
	1st	2nd
Vocational Psychology, (Psy. 220).....	3	
Physiology, (Zool. 207).....	3	
Principles of Education, (Ed. 100).....		3
Secondary Education in Home Economics (H. E. Ed. 400)		3
Costume Design, (H. A. 701).....	2	
Advanced Clothing and Textiles, (H. A. 106).....	4	
House Construction and Decoration, (H. A. 501).....		3
Millinery, (H. A. 301).....		2
Principles of Economics, (Com. 211).....	2	
Housewifery, (H. Ad. 510).....	2	
House Sanitation, (H. Ad. 301).....		2
Modern Language	3	3
	—	—
	17	18

Senior Year

Dietetics, (H. S. 201).....	4	
House Administration, (H. Ad. 501).....		3
Advanced Textiles, (H. A. 601).....	2	
Applied Dress Design, (H. A. 205).....	3	
Tailoring, (H. A. 203).....		3
Applied Design, (H. A. 405).....	2	
Applied Design, (H. A. 407).....		2
Mothercraft, (H. S. 512).....	1	
Educational Psychology, (Psy. 210).....		2
Survey Course in Home Economics (H. E. Ed. 410).....	1	
Practice Teaching, (H. E. Ed. 420 or 430).....		3
Practice House (H. Ad. 530).....	4	
Electives		4
	—	—
	17	17

SUGGESTED COURSE FOR MAJOR IN HOUSEHOLD SCIENCE

	Semester	
	1st	2nd
Junior Year		
General Psychology, (Psy. 200).....	3	
Physiology, (Zool. 207).....	3	
Principles of Education, (Ed. 100).....		3
Secondary Education in Home Economics (H. E. Ed. 400)		3
Costume Design, (H. A. 701).....	2	
Advanced Clothing and Textiles, (H. A. 106).....		4
House Administration, (H. Ad. 501).....		3
House Sanitation, (H. Ad. 301).....	2	
Principles of Economics, (Com. 211).....	2	
Dietetics, (H. S. 201).....		4
Modern Language	3	3
	18	17

Senior Year		
Practice House, (H. Ad. 530).....	4	
Practice Teaching, (H. E. Ed. 420 or 430).....	3	
Institutional Management, (H. S. 505).....		4
House Construction, (H. A. 501).....		3
Advanced Textiles, (H. A. 601).....		2
Mothercraft, (H. S. 512).....	1	
Survey Course in Home Economics, (H. E. Ed. 410).....		1
Housewifery, (H. Ad. 510).....	2	
Educational Psychology, (Psy. 210).....	2	
Electives	5	7
	17	17

Students training for extension work should elect courses including Rural Sociology, Public Speaking, Methods of Demonstration, and Typewriting (Com. 410-411; 2 credits each).

General Group

A minimum of 18 credits must be chosen from this group selected from departments such as:

English, at least 6 credits	
Economics	} at least 6 credits
Political Science	
Sociology	
History	
Language at least 6 credits	
Mathematics	
Art	

Science Group

A minimum of 3 credits must be chosen from this group.

Physiology 207 (prerequisite to Dietetics)
 Zoology
 Chemistry
 Botany
 Bacteriology
 Physics

Home Economics Group

A minimum of 22 credits must be chosen from this group.

(a) Household Science		Semester	
Dietetics, (H. S. 201).....	4	either semester	
House Sanitation, (H. Ad. 301).....	2	"	"
Housewifery, (H. Ad. 510).....	2	"	"
House Administration, (H. Ad. 501).....	3	"	"
Home Nursing, (H. S. 515).....	4	"	"
Practice Housekeeping, (H. Ad. 530).....	4	"	"
Mothercraft (H. S. 512).....	1	"	"

(b) Household Art

Applied Dress Design, (H. A. 205).....	3	either semester	
Advanced Textiles, (H. A. 601).....	2	"	"
Costume Design, (H. A. 701).....	2	"	"
Advanced Clothing and Textiles, (H. A. 106).....	4	"	"
Millinery, (H. A. 301).....	2	"	"
House Construction, and Furnishing, (H. A. 501)	3	"	"
Tailoring, (H. A. 203).....	3	"	"

(c) House Administration**Semester**

Dietetics, (H. S. 201).....	4	either	semester
House Sanitation, (H. Ad. 301).....	2	"	"
Housewifery, (H. Ad. 510).....	2	"	"
House Administration, (H. Ad. 501).....	3	"	"
House Construction, and Furnishing (H. A. 501)	3	"	"
Advanced Textiles, (H. A. 601).....	2	"	"
Advanced Clothing and Textiles, (H. A. 106).....	4	"	"
Home Nursing, (H. S. 515).....	4	"	"

(d) Institutional Management

Dietetics, (H. S. 201).....	4	either	semester
Institutional Management, (H. S. 504).....	3	"	"
Institutional Management, (H. S. 505).....	4	"	"
Catering, (H. S. 210).....	2	second	"
Home Nursing, (H. S. 515).....	4	either	"

(e) Applied Design**1st****2nd**

Applied Design, (H. A. 405).....	2		
Hand Work and Weaving, (H. A. 407).....			2
Advanced Design, (Art 205, 305, or 306).....	2		
Clay Modeling and Pottery (Art 413, 414).....	2		2
Metal Work (Art 600, 601).....	2		2

Industrial Education Group

Vocational Psychology, (Psy. 220).....	3	either	semester
Educational Psychology, (Psy. 210).....	2	"	"
Principles of Education, (Ed. 100).....	3	"	"
Secondary Education in Home Economics, (H. E. Ed. 400)	3	"	"
Survey Course in Home Economics, (H. E. Ed. 410)	1	"	"
Practice Teaching, (H. E. Ed. 420 or 430).....	3	"	"

Home Economics Education 400 is prerequisite to Home Economics Education 420 and 430.

Free Electives

An aggregate of 26 credits may be free electives. These may be chosen from any school or department in College, such as Education, Agriculture, Forestry, Commerce, Pharmacy, etc., provided the prerequisites are met.

Group I (b). This group comprises courses that offer to women the training prescribed by the State Board for Vocational Education to prepare as **Smith-Hughes teachers** of Home Economics in the schools of Oregon.

	Semester	
	1st	2nd
Freshman Year		
General Chemistry, (Chem. 102, 103).....	3	3
Textiles and Clothing, (H. A. 104, 105).....	4	4
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32).....	3	3
Principles of Botany, (Bot. 24).....		2
Library Practice, (Libr. 1).....	½	
Hygiene, (Phys. Ed. 10).....	½	
Survey of Home Economics, (H. S. 50).....	1	
Gymnasium, (Phys. Ed. 5, 6).....	1	1
	—	—
	15	15

Sophomore Year

Organic Chemistry, Chemistry of Foods (Chem. 200, 402)	4	4
Foods and Cookery, (H. S. 106, 107).....	4	4
Design and Color, (Art 204).....	2	
Household Physics, (Phys. 133, 134).....	2	2
Household Bacteriology, (Bact. 304).....		3
English 51, 52.....	3	3
Gymnasium, (Phys. Ed. 7, 8).....	1	1
	—	—
	16	17

Junior Year

General Psychology, (Psy. 200).....	3	
Physiology, (Zool. 207).....	3	
Principles of Education, (Ed. 100).....		3
Secondary Education in Home Economics, (H. E. Ed. 400)		3
Costume Design, (H. A. 701).....	2	
Advanced Clothing and Textiles, (H. A. 106).....	4	
Dietetics, (H. S. 201).....		4
House Sanitation, (H. Ad. 301).....	2	
Housewifery, (H. Ad. 510).....		2
Electives	4	5
	—	—
	18	17

Senior Year	Semester	
	1st	2nd
Advanced Textiles, (H. A. 601).....	2	
House Construction and Furnishing, (H. A. 501).....	3	
House Administration, (H. Ad. 501).....		3
Practice House, (H. Ad. 530).....	4	
Mothercraft, (H. S. 512).....		1
Vocational Education, (Ed. 110).....	2 either semester	
Survey Course in Home Economics, (H. E. 410).....		1
Practice Teaching, (H. E. Ed. 420 or 430).....		3
Electives	8	8
	<hr/>	<hr/>
	17	17

For list of possible electives see page 313.

Sociology.

1. At least 6 credits in Economics, Political Science, or
2. Enough other electives to total 132 credits.

Group II comprises courses that offer to women the opportunity to prepare themselves in Household Science and Household Art primarily for the home, and at the same time afford them abundant opportunity, by the freedom of election in the junior and senior years, for the gratification of individual inclination through a study of Art, English, Modern Language, the Sciences, Horticulture, including Floriculture and Landscape Gardening, Pharmacy, Mines, Physical Education, etc. Group II does not prepare students for positions as teachers, extension workers or institutional managers.

Freshman Year	Semester	
	1st	2nd
Household Chemistry, (Chem. 12, 13).....	3	3
Textiles and Clothing, (H. A. 104, 105).....	4	4
Freehand Drawing, Beg. Comp. (Art 102, 103).....	2	2
College Rhetoric, (Eng. 31, 32).....	3	3
Principles of Botany, (Bot. 24).....		2
Library Practice, (Libr. 1).....	$\frac{1}{2}$	
Hygiene, (Phys. Ed. 10).....	$\frac{1}{2}$	
Survey of Home Economics, (H. S. 50).....	1	
Gymnasium, (Phys. Ed. 5, 6).....	1	1
	<hr/>	<hr/>
	15	15

Sophomore Year	Semester	
	1st	2nd
General Science, including Physiology, Bacteriology, and Physics	4	4
Foods and Cookery, (H. S. 106, 107).....	4	4
Design and Color, (Art 204).....		2
English 51, 52.....	3	3
Modern Language	3	3
Household Accounting, (Com. 120).....	1	
Gymnasium, (Phys. Ed. 7, 8).....	1	1
	16	17

In view of the fact that this course permits of greater election of subjects, suggestive outlines for junior and senior years are not included.

The work of the junior and senior years may be elected from groups below with the restrictions indicated at the head of each group.

General Group

A minimum of 21 credits must be chosen from this group selected from departments such as:

- Economics
- Political Science
- Sociology
- Psychology, at least 3 credits
- English, 6 credits
- History
- Modern Language, 6 credits.
- Mathematics
- Art

Science Group

A minimum of 3 credits must be chosen from this group.

- Physiology 207, prerequisite to Dietetics
- Zoology
- Chemistry
- Botany
- Bacteriology
- Physics

Home Economics Group

A minimum of 12 credits must be chosen from this group.

(a) Household Science

Dietetics, (H. S. 203).....	4	first semester
House Sanitation, (H. Ad. 301).....	2	“ “
Housewifery, (H. Ad. 510).....	2	second “
House Administration, (H. Ad. 501).....	3	“ “
Home Nursing, (H. S. 515).....	4	either “
Practice Housekeeping, (H. Ad. 530).....	4	“ “
Mothercraft	1	first semester

(b) Household Art

Advanced Dress Design, (H. A. 205).....	3	first semester
Advanced Textiles, (H. A. 601).....	2	either “
Costume Design, (H. A. 701).....	2	“ “
Advanced Textiles and Clothing, (H. A. 106).....	3	“ “
Millinery, (H. A. 301).....	2	“ “
House Construction and Decoration (H. A. 501).....	3	“ “
Tailoring, (H. A. 203).....	3	“ “

(c) House Administration

Dietetics, (H. S. 203).....	4	first semester
House Sanitation, (H. Ad. 301).....	2	either “
Housewifery, (H. Ad. 510).....	2	“ “
House Administration, (H. Ad. 501).....	3	“ “
House Construction and Decoration, (H. A. 501).....	3	“ “
Advanced Textiles, (H. A. 601).....	2	“ “
Advanced Textiles and Clothing, (H. A. 106).....	3	“ “
Home Nursing, (H. S. 515).....	4	“ “
Practice Housekeeping, (H. Ad. 530).....	4	“ “

Semester**(d) Institutional Management**

	1st	2nd
Dietetics, (H. S. 203).....	4	
Institutional Management, (H. S. 504, 505).....	3	4
Catering, (H. S. 210).....		2

(e) Applied Design

Applied Design, (H. A. 405, 407).....	2	2
Advanced Design, (Art 305, 306).....	2	2
Clay Modeling and Pottery, (Art 414, 413).....	2	2
Metal Work, (Art 600, 601).....	2	2
Landscape Architecture and Drawing (R. A. 601, 602)....	3	3

Free Electives

An aggregate of 33 credits may be free electives. These may be chosen from any school or department in College, such as Agriculture, Forestry, Commerce, Pharmacy, etc., provided the prerequisites are met.

Students in Home Economics who wish to minor in Commerce should take the following courses as suggested by the Dean of the School of Commerce:

MINOR IN COMMERCE

	Semester	
	1st	2nd
Freshman or Sophomore Year		
Stenography (Com. 400, 401).....	3	3
Typewriting (Com. 410, 411).....	2	2
	<hr/> 5	<hr/> 5

Sophomore or Junior Year

Stenography and Typewriting, (Com. 402, 403).....	3	3
Bookkeeping and Accounting, (Com. 100, 107).....	4	3
	<hr/> 7	<hr/> 6

DIETITIAN'S COURSE

The course outlined below is intended for women who desire competent training to fit themselves to become dietitians in hospitals, institutions under state, county, charity, or private management where large numbers of people are housed and fed, or dietitians under military or Red Cross auspices. Students matriculating for this course must be at least twenty-one years of age, and graduates of a four-years high-school course of study or its equivalent. To secure a dietitian's certificate, sixty-eight credits are required, including three months of practical field work.

	Semester	
	1st	2nd
First Year		
Household Chemistry, (Chem. 12, 13).....	3	3
College Rhetoric, (Eng. 31, 32).....	3	3
Physiology, (Zool. 207, 208).....	3	3
Home Economics Bacteriology, (Bact. 304).....		3
Foods and Cookery, (H. S. 106).....		4
Household Management, (H. S. L.).....	2	
Principles of Economics, (Com. 211).....	2	
Typewriting, (Com. 410).....	2	
	15	16
Second Year		
Nutritional Physiology, (Zool. 205).....		3
Foods and Cookery, (H. S. 107).....	4	
Dietetics, (H. S. 203).....		4
* Home Nursing, (H. S. 515).....	4	
Institutional Management, (H. S. 504, 505).....	3	4
English or Modern Language.....	3	3
Vocational Psychology (Psy. 220).....		3
Home Economics Bacteriology, (Bact. 305).....	3	
	17	17

Field work to be arranged, 3 credits.

* Students who have had hospital training may choose an elective in place of H. S. 515, 4 credits.

HOMEMAKERS' COURSES

The one-year Homemakers' course, established 1914, is provided especially for those women whose schooling may not qualify them to enter the degree courses, whose duties demand that they shall content themselves with a brief period of training for their life work, or whose aim in seeking training at the College is exclusively practical. The purpose of the other short courses in Home Economics is quite similar to this — to provide, in the short time assigned to the particular courses, the fullest and most fruitful training that is possible to offer with the facilities of a thoroughly modern School of Home Economics, and to present this training in such a way that it shall be most immediately and constructively helpful to the particular patrons of the given courses. Only the

one-year Homemakers' course and the regular degree courses are outlined here, the others being presented in the usual special bulletins issued for the Winter Short Course and the Summer School.

Admission to any of the Homemakers' courses demands an educational qualification not greater than an eighth grade or common-school course; and in the instance of mature persons, otherwise capable of carrying on the work, even this qualification may be waived.

One-year Homemakers' Course	Semester	
	1st	2nd
Foods and Cookery, (H. S. H and I).....	5	5
Care of Children, (H. S. J).....	1	
Clothing and Textiles, (H. A. R and S).....	4	4
Household Management, (H. S. L).....	2	
Elementary Physiology, (Zool. A).....	2	
Home Nursing and Invalid Cookery, (H. S. M).....		2
House Furnishing, (H. A. N).....		2
Hygiene, (Phys. Ed. 10).....	1½	
Gymnasium, (Phys. Ed. 1, 2).....	1	1
Millinery, (H. A. T).....		2
	<hr/> 15½	<hr/> 16

HOUSEHOLD ART

HELEN LEE DAVIS, Associate Professor
CORA PLATT MILLER, Instructor
HELEN PEER ROBINSON, Instructor
JUNE SEELEY, Instructor
LOUISE ALBERTA SCHNEIDER, Instructor
MARGARET MOREHOUSE, Instructor
JESSIE BILES, Instructor

The department of Household Art is located in the new Home Economics building and occupies one-half of the second floor and the entire third floor of the completed east wing of this structure. There are five large laboratories, with excellent modern equipment, devoted to this department.

The following courses are offered:

100. Elementary Clothing and Textiles. (For Freshmen students who have had no high-school work in sewing.) The fundamental processes of hand and machine sewing applied to the designing and constructing of under garments and household articles. Free-hand cutting. Drafting. Use of patterns. Decorative needlework. Repairing.

Textiles: Tracing of development of textile industry from primitive times in order better to understand the modern industry. Study of production, manufacture, and distribution of cotton and linen as influencing factors in their cost, quality, etc. Study of cottons and linens relative to their use in the home and for clothing purposes.

Freshman year; either semester; 4 credits; 2 recitations; 3 laboratory periods; 4 hours outside preparation. Fee \$1.00.

104. Clothing and Textiles. (For freshman students who have had one year or more of sewing in accredited high schools. If students are not able to carry this work successfully they will be required to take 100.) Choice of materials and trimmings from standpoint of appropriateness, economy and beauty. Designing and construction of cotton and linen dresses. Free-hand cutting. Drafting. Use of commercial patterns. Remodeling problem. Preparation and use of dress form.

Textiles: Tracing of development of textile industry from primitive times in order better to understand the modern industry. Study of production, manufacture, and distribution of cotton and linen as influencing factors in their cost, quality, etc. Study of

cottons and linens relative to their use in the home and for clothing purposes.

Freshman year; either semester; 4 credits; 2 recitations; 3 laboratory periods; 4 hours outside preparation. Fee \$1.00.

105. Clothing and Textiles. (Continuation of course 104.) Choice of materials and trimmings from standpoint of appropriateness, economy and beauty. Principles of Design applied to silhouette, proportion, line, and color. Designing and constructing of lingerie and wool dresses, and children's clothes. Draping and designing on the figure.

Textiles: Study of production, manufacture and distribution of wool and silk as influencing factors in their cost, quality, etc.

Study of silk and wool materials relative to their use in the home and for clothing purposes. Children's clothes. Ready-made clothing vs. home-made. Sweat-shop work. Social agencies for bettering industrial conditions. Responsibility of consumer, etc.

Prerequisites: H. A. 104, Art 102. Freshman year; either semester; 4 credits; 2 recitations; 3 laboratory periods; 4 hours outside preparation. Fee \$1.00.

106. Advanced Clothing and Textiles. Designing and constructing of fancy blouses and silk afternoon dresses. Renovation problems. Designing and draping on figure.

Appropriate and economic dress. Cost of clothing. Hygiene of clothing. Care of clothing. Minor textile fibers, their use and importance. Study of laces and embroideries.

Prerequisites: H. A. 104, 105; Art 102, 103; H. A. 701 either prerequisite or parallel. Junior year; either semester, 4 credits; 1 recitation; 3 laboratory periods; 2 hours outside preparation. Fee \$1.00.

203. Tailoring. Principles and processes of tailoring taught on small-size skirts and coats, and the making of one cloth or silk suit.

Development of factory system. Modern industrial conditions. Labor organizations for civic and industrial improvement. Laws of Oregon.

Prerequisites: H. A. 106. Elective; either semester; 3 credits; 1 recitation; 6 hours laboratory; 2 hours outside preparation. Fee \$1.00.

205. Applied Dress Design. Designing, modeling and constructing of afternoon and evening dresses. Emphasis on design and color.

Study of dress from historic and artistic standpoints.

Prerequisites: H. A. 106, 701, Art 204. Elective; either semester; 3 credits; 1 recitation; 6 hours laboratory. Fee \$1.00.

301. Millinery. Designing and constructing frames. Methods of covering. Making and placing of trimmings. Renovation of materials.

Elective; either semester; 2 credits; 2 laboratory periods; 2 hours outside preparation. Fee \$1.50.

405. Applied Design. Form of decorative art which involves careful consideration of form, color, and design. These principles will be considered in basketry, caning, and rushing.

Elective; either semester; 2 credits; 3 laboratory periods. Fee \$3.00.

407. Applied Design. Designs made and executed in weaving, embroidery, and various forms of decoration for clothing and house furnishings. Dyeing. Emphasis on design and color.

Elective; either semester; 2 credits; 3 laboratory periods. Fee \$3.00.

501. House Construction and Decoration. Plans made for medium-sized homes; the best utilization of space, the most economical placing of equipment and the decoration and furnishing of a house in the most economical, sanitary, and artistic manner.

Elective; either semester; 3 credits; 2 recitations; 2 laboratory periods; 3 hours outside preparation. Fee \$1.00.

601. Advanced Textiles. Principles of art, economics, hygiene, and psychology applied to clothing. Study of adulterants and substitutes. Microscopic and chemical analysis of materials.

Senior elective; either semester; 2 credits; 2 recitations; 4 hours outside preparation. Fee \$1.00.

701. Costume Design. Study of the figure. Sketching of costumes. Study of line, proportion, and color in relation to good taste in dress. Problems in designing and modeling based upon historic study and art principles.

Prerequisites: Art 102, 103, 204. Either semester; 2 credits; 2 lectures; 1 laboratory period; 2 hours outside preparation. Fee \$1.50.

N. House Furnishing. The furnishing of the home from an economic, sanitary, and artistic standpoint. Exhibits and excursions.

Homemaker's course; second semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

R. Textiles and Clothing. Textile lectures given for the purpose of assisting the homemaker in her selection, use, and care of fabrics in the home. Laboratory work is planned to give the student practical experience in the making of all needlework problems that are to be met in the home.

Homemakers' course; either semester; 4 credits; 2 recitations; 4 laboratory periods; 2 hours outside preparation. Fee \$1.00.

S. Textiles and Clothing. Continuation of course R. Lectures on good taste in dress, cost of clothing, hygiene of clothing, care of clothing. Laboratory work gives the student experience in the making of wash dresses, children's clothes, wool dresses, and the renovating of clothing.

Homemakers' course; either semester; 4 credits; 2 lectures; 4 laboratory periods; 2 hours outside preparation. Fee \$1.00.

T. Millinery. Designing and constructing hats. Making and placing of trimmings. Renovation of materials.

Homemakers' course; 2 credits; 2 laboratory periods. Fee \$1.50.

Note: In all H. A. courses orders will be taken for students who do not wish to make garments for themselves.

HOUSEHOLD SCIENCE

AVA BERTHA MILAM, Professor
ALICE MARKS DOLMAN, Assistant Professor
SARAH LOUISE LEWIS, Assistant Professor
ALMA GRACE JOHNSON, Assistant Professor
LAURA JEAN CHENEY, Instructor
SIBYLLA HADWEN, Instructor
CHRISTIE MOORE, Instructor
MARY ELIZABETH KOLL, Instructor
INEZ VALENTIA BOZORTH, Instructor
MINNIE KALBUS, Instructor
SARA WATT PRENTISS, Instructor

The department of Household Science is located in the new Home Economics building and occupies the basement, the first floor, and one-half of the second floor of the completed east wing of this structure. There are four large laboratories, with excellent modern equipment for all types of food preparation. A small laboratory, equipped with various kinds of cooking apparatus, is designed for special class work. Adjoining this laboratory is a dining room large enough to accommodate twenty people. This is used for meal serving and enables the students to put into actual practice the knowledge gained elsewhere.

With the leasing of a furnished eight-room house in close proximity to the College, a new and significant feature was added to the Home Economics course in September, 1916. In groups of eleven, advanced students are afforded the opportunity of living in the house for six to eight weeks under the supervision of a House Administration faculty woman. The problems of house-keeping, including the purchasing, care, and cooking of food, the planning of meals, the care of the house and family laundry, are conducted by the students. The economic side is given particular attention, and the fees paid by the students in this course cover the entire operating expenses of the house.

The new course in Institutional Management offered advanced students for the first time this year, has been made possible by securing a furnished house near the Home Economics building, specially arranged and equipped to serve at least fifty people daily. Here the students will have the opportunity of working out the problems of a fifty-unit institution, from the general helper to the manager. There is no fee for this course and living is furnished students while resident in the house.

The following courses are offered:

100. Principles of Foods and Cookery. This course is for students who have had no domestic science in high school. It aims to give laboratory technique and a resume' of elementary cookery and is a prerequisite to H. S. 106; sophomore year; either semester; 2 credits; 1 lecture; 2 two-hours laboratory periods. Fee \$3.00.

106. Foods and Cookery. An introduction to the subject of foods in their scientific and economic aspect, selection, preparation, and use. The processes of digestion, absorption, and assimilation.

Prerequisites. General Chemistry 102, 103; Principles of Botany 24; parallel, Organic Chemistry 200, or Household Chemistry and Physiology. Household Science; sophomore year; either semester; 4 credits; 2 lectures; 2 three-hours laboratory periods. Fee \$6.00.

107. Foods and Cookery. A continuation of course 106; canning and preserving of foods, menu making, and table service.

Prerequisites: Foods and Cookery 106; parallel, Chemistry of Foods 402. Household Science; sophomore year; either semester; 4 credits; 2 lectures; 2 three-hours laboratory periods. Fee \$6.00.

120. Methods of Demonstrations. A course preparing students to give public demonstrations in food selection and preparation. Types of demonstrations, equipment required, organization of plans, general method of procedure, results to be obtained from demonstrations. Illustrative demonstrations by instructor. Student demonstrations.

Prerequisite: H. S. 106, 107. Household Science; senior elective; second semester; 1 credit; 1 three-hours laboratory period. Fee \$1.50.

190. Camp Cookery. Instructions in various ways of combining into palatable and nutritious products such food materials as are available for use in camps; the making of different kinds of breads, as well as mulligans, and other camp dishes. Practice during the latter part of the course in preparing food out of doors by means of dutch ovens, reflectors, and improvised cooking utensils.

Household Science elective; junior or senior men in Forestry, Agriculture, Engineering, and Commerce courses; second semester; 1 credit; 1 laboratory period. Fee \$2.50.

191. Cookery for Men. A course for men who are planning and preparing their own meals or who are acting as managers of clubs. The uses of food in the body, factors affecting food requirements, making of menus suited to the needs of individuals under various living conditions. The practical work includes the making of numerous dishes and the serving of well-balanced meals at reasonable cost.

Household Science; elective to all men of the College; first semester; 1 credit; 1 three-hours laboratory period. Fee \$2.50.

201. Dietetics. A scientific study of food materials in their relation to the daily dietary of families under various conditions of health and environment; a study of the dietary standards of metabolism. A comparison of the nutritive values of the common foods, made by computing, preparing, and serving dietaries of specific costs, furnishing specific nutrients.

Prerequisites: Household Science 106 and 107; Physiology 207. Elective; either semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$4.00. Texts: Rose, Laboratory Manual of Dietetics. Sherman, Chemistry of Foods and Nutrition. Reference assignments.

203. Dietetics. A simplified course in dietetics dealing with a study of food materials in their relations to daily dietaries of families under various conditions of health and environment, and a comparison of nutritive values of common foods made by computing, preparing, and serving dietaries of specific costs furnishing specific nutrients.

Prerequisites: Household Chemistry, 6 credits; Household Science 106, 107, and Physiology 207. Elective; second semester; 4 credits; 2 recitations; 2 laboratory periods. Fee \$4.00.

210. Catering. Designed for students who are interested in the management of tea rooms and lunch rooms and in catering for private entertainments. The work includes the purchase, preparation, and service of refreshments at such functions as afternoon teas, luncheons, and small banquets. The students are expected to devote at least six hours a week to the course.

Prerequisite: Household Science 201 or 203. Elective; senior year; second semester; 2 credits; 1 laboratory period of six hours. Fee \$2.00.

301. House Sanitation. The house as a factor in health. Situation, surroundings, ventilation, heating, drainage, plumbing,

lighting, and furnishing of the house. Investigation of general sanitary conditions from a practical and scientific standpoint with special reference to the needs of the community, household, and school.

Junior year; either semester; 2 credits; 2 recitations. Text: Talbot, House Sanitation (as guide).

501. Household Administration. The organization and control of the home. The economic relations of the household, applying scientific and economic principles to its problems. A study of family income and its equivalent in productive labor within the household. Family expenditures and their regulation. The budget as a measure of standards of living. The domestic service problem and efficiency of the household.

Prerequisite: (for degree students) Economics 211. Household Science; junior or senior elective; either semester; 3 credits; 3 lectures.

504. Institutional Management. The course is designed to give practice in handling food materials in large quantities; making of menus; methods of record keeping; planning and equipping of large institutions. Problems of cost and replacements; practical work in the housekeeping departments of Waldo and Cauthorn Halls, where these problems are studied, also those of the care of linen, sanitation, and service.

Prerequisite: (for degree students) Household Science 201 or 203, Economics 211; (for Dietitians 106 and 107). Parallel or prerequisite; Household Administration. Senior year; either semester; 3 credits; 2 lectures; 1 three-hours laboratory period.

505. Institutional Management. This course is planned to give to the advanced student practical work in the management of a fifty-unit dining room. Each girl is assigned in turn to the various kitchen and dining-room duties.

Prerequisite: H. S. 201 or its equivalent. H. S.; elective; senior year; either semester; $\frac{1}{2}$ credit a week. No fee; living furnished while resident in house.

510. Housewifery. Efficiency in the care of the house, from the chemical, economic, and practical standpoint. The treatment of floors, walls, and woodwork. The removal of stains. The cleaning of rugs and carpets. Laundering of household linen and clothing. The selection of cleaning apparatus and machinery.

Prerequisites: General Chemistry 100, 101. Junior year; either semester; 2 credits; 1 lecture; 1 three-hours laboratory period. Fee \$0.50. Texts: L. Ray Balderston, *Laundering*; E. G. Osman, *Cleaning and Renovating at Home*.

512. Mothercraft. Brief study of the child from time of conception to maturity, with special emphasis on care and feeding of the infant, and young child.

Prerequisite: Physiology 207; 1 credit; 1 lecture.

515. Home Nursing. Care of patient under home conditions. Symptoms. First aid to the injured. Management of communicable diseases. Disease as affected by foods. Invalid diets.

Prerequisite: Physiology 207; Bacteriology 304; 3 recitations; 1 two-hours laboratory period; 4 credits. Fee \$2.00.

530. Practice Housekeeping. This course deals with the problems of homemakers. The students put into actual practice and apply to real home conditions the Principles of Cookery, Housewifery, Household Management, and Methods of Laundering, studied in their college course. Each girl does every duty concerned in the management of the house during the time she is a resident there. Special attention is given to the economic side of the question. The students carry their regular college work during the time they live in the practice house.

Prerequisites: Household Science 107 or its equivalent. Household Science elective; junior and senior years; either semester; $\frac{1}{2}$ credit a week. Fee \$5.00 a week living expenses.

550. Modern Problems in Household Administration. The topics assigned for research will be chemical, physiological, bacteriological, economical, or sociological, according to the preferences and training of the individual student.

Graduate year; first semester; credits to be arranged.

551. Modern Problems in Household Administration. A continuation of the research work commenced in course 550.

Graduate year; second semester; credits to be arranged.

701. Special Research in Cookery. In assigning research problems for graduate students, both the previous training and the student's preferences are considered. Assignment of problems to be worked upon during the year is made by the professor in charge.

Graduate year; first semester; credits to be arranged.

702. Special Research in Cookery. Continuation of research work commenced in course 701.

Graduate year; second semester; credits to be arranged.

H. Foods and Cookery. The study of foods, source, economical purchase, storage, and cookery. Gives the student a working knowledge of the nutritive value of foods. Offers extended experience in practical cooking, with careful estimation of cost and quantity, special attention being given to preservation of foods.

Homemakers' course; first semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$6.00.

I. Foods and Cookery. A continuation of course H. This course aims to present the fundamental principles of human nutrition and to teach their application under varying physiological, economic, and social conditions. Special attention given to making of menus and preparation and service of meals.

Homemakers' course; second semester; 5 credits; 2 recitations; 3 laboratory periods. Fee \$6.00.

J. Care of Children. Physical and mental development. Proper feeding and clothing. General care from infancy through adolescence.

Homemakers' course; second semester; 1 credit; 2 lectures.

L. Household Management. Lectures and laboratory hours given to study of home problems, the choice of site for the house, construction, lighting, heating, plumbing, disposal of waste, and general care of home. The study of modern labor-saving devices, the best cleaning agents, care of floors and woodwork, and the common laundry operations. This course is optional with English.

Homemakers' course; first semester; 2 credits; 2 lectures; 1 laboratory period. Fee \$0.50.

M. Home Nursing and Invalid Cookery. Observation of symptoms. Administration of food and medicine. Care of the sick under home conditions. Preparation of food for the invalid. Manner of service.

Homemakers' course; second semester; 2 credits; 2 lectures; 1 laboratory period. Text: Aiken, Home Nurses' Handbook of Practical Nursing. Fee \$2.00.

SCHOOL OF MINES

EDGAR KIRKE SOPER, Dean

Four-years courses leading to the degree of Bachelor of Science in Mining Engineering, Mining Engineering (in Geology), and Ceramic Engineering are offered. The advanced degrees of Mining Engineer, (in Geology), Mining Engineer, and Ceramic Engineer are conferred upon the completion of the requisite amount of graduate work as prescribed elsewhere in this Catalogue.

Instruction is given by means of lectures and textbooks, supplemented by recitations, and by much work in the laboratories and field. While the more theoretical studies are not neglected, a determined effort is made to emphasize the practical application and value of all the subjects taught. For this reason, nearly fifty percent of a student's time is spent in laboratory courses.

The School of Mines occupies a new, commodious, three-story and basement building especially designed for housing the lecture rooms and laboratories devoted to mining, metallurgy, ore dressing, geology, ceramic engineering, and closely allied subjects.

The first two years in all three departments are identical, and are intended to give the student a thorough comprehension of those studies basic to all branches of engineering; namely, Mathematics, Physics, Chemistry, Mechanical Drawing, Plane Surveying, and Shop Work. To these fundamental subjects are added courses in Mineral Industry, Crystallography and Blowpipe Analysis, and Determinative Mineralogy.

In the last two years, the student takes up the technical studies distinctive of the course pursued. This leads to considerable variation in the work of the different departments, as is indicated in the outline of courses. Statics and Dynamics, Strength of Materials, Hydraulics, and Electrical Machinery are required, however, in all courses except Geology.

At least two months employment in industrial lines closely allied to the course pursued, is a prerequisite to graduation.

The work in the School of Mines is so broad in nature that it should equip a student for general engineering operations of many kinds, but particular emphasis is placed, naturally, upon preparation for those fields of activity that are concerned with the discovery, mining or quarrying, and preparation for market, of the mineral wealth with which the Northwest is so richly endowed.

Equipment. The new Mines building provides spacious and well-lighted offices, laboratories, and lecture rooms for the work of this department.

The Assaying and Metallurgical laboratory is a cement-floored room 30 feet wide and 60 feet long on the first floor of the building and extends across the entire east end. It is amply lighted by windows on one side and both ends. At the south end of the room are the most modern types of oil and gasoline furnaces for fusion and other fire work. Conveniently arranged nearby are suitable lockers and work tables with the necessary tools, fluxes, etc. The north end of the room is adequately equipped with sinks, ventilating hoods, gas burners, electric hot plates, and other apparatus for carrying on the various operations involved in parting buttons, assaying solutions, making cyanide tests, etc. One corner of the laboratory is partitioned off for a balance room and provided with the most delicate balances for weighing the gold beads. Balances of both the Keller and Ainsworth makes are available.

The Crushing and Sampling laboratory in the basement is 25 feet by 30 feet. It contains a power-driven sample crusher of the latest design and one of the recently modeled disk grinders, for properly pulverizing samples for assay or other purposes. The usual bucking-board and muller and other hand-grinding devices are also available for student use, together with a Jones sampler and other appliances used in preparing samples. All such work is done in this room, to avoid dust in the other laboratories.

The Ore-Testing laboratory is a room 25 by 30 feet in the basement of the building. It is equipped with appliances for studying the behavior of ores when subjected to the various operations of jigging, vanner, table, and magnetic concentration.

The Mining Draughting room is furnished with convenient desks and tables and all necessary equipment for the use of mining students.

The Geology and Mineralogy laboratories and the Geological museum occupy the entire third floor of the Mines Building and are completely equipped with extensive collections of ores, rocks, minerals, thin, sections, and geologic and topographic maps. For detailed descriptions see under **Geology**.

MINING ENGINEERING

BURTON LEIGH CUNNINGHAM, Associate Professor

The course in Mining Engineering is designed to give the student thorough training in the fundamentals of the science of mining, metallurgy, and geology, and to prepare him for positions of responsibility in the industrial life of the country, and particularly in the mining field. The course is of such a comprehensive character that a graduate finds it of aid in varied employments. The positions which are open to graduates of the School of Mines, include: assayer, chemist, or metallurgist at mines and smelters; on staffs of Government and state geological surveys; on the staff of the Government Coast and Geodetic Survey; land or deputy mineral surveyor; draftsman and designer in engineering establishments; on the engineering and geological staffs of mining companies, oil companies, exploration companies, and railroads; and in the land classification work of the government forest service. He may expect that after having acquired the necessary maturity he will be competent to fill responsible positions in any one of the many branches of mining, milling, smelting, and geology.

DEGREE COURSE IN MINING ENGINEERING

Freshman Year	Semester	
	1st	2nd
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Elementary Analysis (Math. 31).....		5
General Chemistry (Chem. 105, 106).....	5	5
Mechanical Drawing (C. E. 107).....	3	
The Mineral Industry (Min. 209).....	1	
Descriptive Geometry (M. E. 153).....		3
Modern English Prose (Eng. 91, 92).....	2	1
Forging and Tool Dressing (Ind. Arts 158).....		2
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	½	½
	17½	17½

	Semester	
	1st	2nd
Sophomore Year		
Principles of Metallurgy (Met. 431).....		2
Differential and Integral Calculus (Math. 51, 52).....	4	4
Engineering Physics (Phys. 101, 102).....	4	4
Quantitative Analysis (Chem. 400).....	4	
Crystallography and Blowpipe Analysis (Geol. 111).....	3	
Determinative Mineralogy (Geol. 112).....		3
Plane Surveying (C. E. 232).....		4
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$

Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Hydraulics (I. E. 102).....		3
Electrical Machinery (E. E. 403).....		3
Metallurgy of Iron and Steel (Met. 410).....		2
General Geology (Geol. 135).....	3	
Petrology (Geol. 137).....	3	
Petrography (Geol. 139).....		2
Assaying (Met. 401).....	3	
Mine Surveying (Min. 212).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/> 16	<hr/> 18

	Semester	
	1st	2nd
Senior Year		
Metallurgical Laboratory (Met. 423 and 424).....	2	2
Metallurgy of Gold and Silver (Met. 421).....	2	
Metallurgy of Copper, Lead, and Zinc (Met. 412).....		2
Mining and Power Equipment (Min. 231).....	3	
Mining Methods (Min. 224).....	3	
Mine Economics and Mining Law (Min. 222).....		3
Ore Dressing (Met. 425).....	4	
*Mine Plant Design (Min. 232) or Metallurgical Design (Met. 432).....		2
Economic Geology (Geol. 182).....	2	
Ore Deposits (Geol. 181).....		3
Problems in Economic Geology (Geol. 184).....		2
General Engineering Laboratory (Exp. E. 210).....		2
	16	16

Suggested Electives

Elementary Spanish (Spanish 301).....	3	
Elementary French (French 101).....	3	
Excavation, Explosives, and Blasting (Min. 226).....		2
Interpretation of Geologic and Topographic Maps (Geol. 186)		2
Technical English (Eng. 141).....	3	
Principles of Economics (Economics 210).....	3	

Upon the approval of the Dean, students may substitute a modern language for English in the freshman year.

* In the senior year, the student may choose between these two courses.

The following courses are offered:

209. The Mineral Industry. An introductory course designed to give to the School of Mines student a general idea of the main features of his profession. Elementary geology occupies the first two months of the semester and is a brief discussion of the subject, the aim being to summarize the various phases that are taken up in detailed courses later. Several lectures on the ceramic industry are given and several devoted to the essentials of mining and metallurgy. This course covers the whole field of the mineral industry. A certain amount of time is spent in the study of the mineral resources of Oregon.

Freshman year; first semester; 1 credit; 2 lectures. Required of students in the School of Mines, but elective to any one interested.

212. Mine Surveying. Supplementary to Plane Surveying, taken in the freshman year. Methods are studied in underground surveying and mine mapping, in locating and patenting claims, and in such geodetic and topographic surveying as a mining engineer is often called upon to do; facility in the practical application of these methods is imparted by actual work in the field. Considerable attention is given to the solution of the many problems involving surveying which arise in mining operations; and some time is devoted to the study of the laws regulating the location, possession, and operation of mineral deposits in the United States.

Prerequisite: C. E. 201. Junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Deposit \$2.00.

222. Mine Economics and Mining Law. A detailed study of the costs of mining and milling; methods of mine accounting and cost keeping; a study of the mining law of the United States, Canada, and Mexico; discussion of the economics of mining.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering. Senior year; second semester; 3 credits; 3 recitations.

224. Mining Methods. A study of the methods of mining, including explosives and blasting, prospecting, stoping, timbering, pumping, ventilation, transportation, hoisting, and mine sampling. Presented largely through lectures, and supplemented by textbook and directed reference work.

Prerequisite: Completion of freshman, sophomore, and junior work in Mining Engineering. Senior year; first semester; 3 credits; 3 recitations.

225. Military Mining and Explosives. Types of explosives used in military work. The handling, storage, and use of explosives. Earth and rock excavation and blasting. Methods of tunneling, shaft sinking and quarrying. Mining methods used in trench and bomb-proof construction. Geologic factors influencing military mining operations. Geologic factors influencing ground-water seepage and methods of controlling seepage to keep trenches dry. Interpretation of topographic maps as an aid to mining operations.

Open to all students in the Reserve Officers Training Corps; second semester; 1 lecture; 1 recitation period each week; $\frac{1}{2}$ or 1 credit according to amount of time devoted to subject.

226. Excavation, Explosives, and Blasting. Methods and cost of earth and rock excavation, tunneling and shaft sinking, a study

of the various kinds of explosives used in mining and excavation work; methods of handling and storing explosives; and methods of blasting.

Prerequisites: Completion of freshman work in Engineering. **Elective.** Open to all sophomore, junior, and senior students in the School of Engineering and in the School of Mines. First semester; 3 credits; 3 lectures or recitations, with outside reading and reference work.

231. Mine and Power Equipment. A study of surface and underground equipment for mines, including haulage systems, hoists, compressors, drills, pumps, etc. The course also involves a discussion of the sources of power, water, hydro-electric, steam, gas, and compressed air, together with problems illustrating their application to mining operations. The subject is presented by means of lectures, supplemented by textbooks, trade catalogues, selected references in technical journals, and numerous problems which are assigned to the student for solution.

Prerequisites: Completion of freshman, sophomore, and junior work in Mining Engineering; senior year; first semester; 3 credits; 3 recitations.

232. Mine Plant Design. In this course each student is required to design and get out detailed plans and specifications for an ore bin, head frame, and other mine equipment, to meet the requirements of a hypothetical mine as given in problem.

Prerequisites: Completion of freshman, sophomore, junior, and first semester of senior work in Mining Engineering. Senior year; second semester; 2 credits; 2 three-hours periods a week in drafting room.

299. Practical Work in Mining: Students in the School of Mines are required, before the senior year, to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course being pursued. Evidence of the nature, quality, and sufficiency of the work will be passed upon by the proper department before credit is given. While the minimum requirement is two months, it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. Insight into the technical subjects studied later, also an appreciation of their application to the conditions met in practice on a commercial scale, are thus gained.

METALLURGY

CHARLES EDWARD NEWTON, Associate Professor

401. Assaying. The quantitative determination of the constituents of reagents, fluxes, ores, and metallurgical products. This work embodies the chemical and physical principles of assaying used in conjunction with technical methods.

Prerequisites: Chem. 301 and 401. Geol. 112. Junior year; first semester; 3 credits; 3 laboratory periods. Deposit \$20.00.

402. General Metallurgy. The object of this course is to give general information on the method of producing, manufacturing, using, and conserving the metals which are in general use in the arts.

Prerequisites: None. Elective. Open to all but Mining students; first semester; 3 credits; 3 recitations.

410. Metallurgy of Iron and Steel. The metallurgy and the manufacture of iron and steel, with reference to their properties, and their uses in the arts and in the field of engineering.

Prerequisites: Chem. 301 and 401. Physics 101 and 102. Required of all junior Mining students. Elective for students in the School of Engineering; junior year; second semester; 2 credits; 2 recitations.

412. Metallurgy of Copper, Lead, and Zinc. In this work each metal will be considered separately. The furnaces, processes, and apparatus used in the production of the metals from the ore, will be studied in detail.

Prerequisites: Met. 401 and 431. Senior year; second semester; 2 credits; 2 recitations.

414. Metallurgy of the Minor Metals. The metallurgy of mercury, tin, aluminum, nickel, arsenic, antimony, etc. A study of the methods of production and the uses in the arts.

Prerequisites: Met. 401 and 431. Elective; open to Mining and Chemical Engineering students; senior year; second semester; 2 credits; 2 recitations.

421. Metallurgy of Gold and Silver. The chemical and the physical principles of smelting, amalgamation, cyanidation, and general processes, together with the mechanical devices and operations necessary to carry on the work of producing gold and silver from their ores.

Prerequisites: Met. 401 and 431. Senior year; first semester; 2 credits; 2 recitations.

423-424. Metallurgical Laboratory. Laboratory tests in conjunction with courses 421, Metallurgy of Gold and Silver, and 412, Metallurgy of Copper, Lead, and Zinc.

Prerequisites: Met. 401 and 431. Senior year; first and second semesters; 2 credits; 2 three-hours laboratory periods. Deposit \$5.00 for each semester.

425. Ore Dressing. General principles of Ore Dressing as breaking, grinding, sizing, classifying, concentrating by jig and tables, and by special processes as magnetic, electrostatic, flotation, and air separation. Laboratory work includes work with laboratory size machines for most of the above processes.

Prerequisite: Met. 401. Senior year; first semester; 4 credits; 3 recitations; 1 three-hours laboratory period. Deposit \$3.00.

431. Principles of Metallurgy. A study of the properties of metals, alloys, temperature measurements, metallurgical operations, refractories, and fuels.

Prerequisites: Chem. 301 and 401. Physics 101 and 102. Sophomore year; second semester; 2 credits; 2 recitations a week.

432. Metallurgical Design. The study of plant flow sheets, the designing of apparatus for metallurgical operations, the working up of flow sheets for milling, smelting, and leaching operations.

Prerequisites: Met. 401 and 431. Elective for Mining students. Senior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00.

442. Electro-Metallurgy. The principles, processes, and apparatus involved in using electrical energy for the smelting and refining of ores and metals.

Prerequisites: Met. 401 and 431. E. E. 401. Elective for Chemical and Electrical Engineering students. Senior year; second semester; 2 credits; 2 recitations.

GEOLOGY

EDGAR KIRKE SOPER, Professor
GEORGE EDWARD GOODSPEED, Assistant Professor

While most of the courses in Geology are designed to meet the demands of the departments in the School of Mines, special courses are offered for students in Engineering, Forestry, and Agriculture. Those who desire to specialize in the geological side of mining are given an opportunity to take a special degree course in Mining Engineering, majoring in Geology.

Equipment. The laboratories for Geology are situated on the third floor of the Mines building and comprise a Geologic and Mining museum, a Mineralogic laboratory, and a Petrologic laboratory.

In the Museum are conveniently arranged collections of ores, minerals, and rocks from every important mining camp in the State. There are also framed photographs from the various mining regions and a large scale relief map of the State. Besides the collections, there are many specimens of minerals, rocks, and fossils from numerous American localities. Geologic products are shown, such as samples of all the different grades of clay wares and cement goods. The above collections are attractively displayed in twelve glass-top cases and sixty feet of wall case.

The Mineralogic laboratory possesses the following collections:

No. 1, the Mineral Type Collection, consisting of about 1500 characteristic and labeled specimens used by the students for the purpose of study and comparison.

No. 2, an Exhibit Collection of minerals, consisting of large and attractive specimens.

No. 3, a Working Collection of minerals, consisting of about 7000 unlabeled specimens similar to those in the Type Collection.

No. 4, a Crystal Collection, containing about 1000 natural crystal forms.

No. 5, a Crystal Model Collection, consisting of 48 large glass crystal models and about 750 smaller wooden models used by the students in the study of crystallography.

No. 6, a Blowpipe Collection, containing minerals and metals used in blowpiping.

The Petrologic laboratory contains the following collections:

No. 1, the Rock Type Collection, consisting of about 500 characteristic labeled specimens used by the student for the purpose of study.

No. 2, the Working Collection of Rocks, containing about 2000 unlabeled specimens for the use of the students in the work of petrology.

The Petrologic laboratory is also equipped with polarizing microscopes and the following collections for use in the study of petrography:

No. 1, thirty-six mineral sections for use in petrography.

No. 2, a loaned petrographic collection of over 1200 rock specimens and their respective thin sections.

DEGREE COURSE IN MINING ENGINEERING (GEOLOGY)

(Freshman and sophomore years same as for Mining Engineering)

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Hydraulics (I. E. 102).....		3
Principles of Metallurgy (Met. 431).....		2
Metallurgy of Iron and Steel (Met. 410).....		2
General Geology (Geol. 135).....	3	
Petrology (Geol. 137).....	3	
Petrography (Geol. 139).....		3
Assaying (Met. 401).....	3	
Mine Surveying (Min. 212).....		3
Field Geology (Geol. 190).....	2	
Historical Geology and Stratigraphy (Geol. 155).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	—	—
	18	18

	Senior Year	Semester	
		1st	2nd
Mining Methods (Min. 224).....		3	
Mine Economics (Min. 222).....			3
Ore Dressing (Met. 425).....		4	
Economic Geology (Geol. 182).....		3	
Ore Deposits (Geol. 181).....			3
Problems in Econ. Geol. (Geol. 184).....			2
Geology of Igneous Rocks (Geol. 156).....			3
Oil Geology (Geol. 188).....		2	
Thesis		2	2
Recommended Electives		2	3
		—	—
		16	16

The following courses are offered:

111. Crystallography and Blowpipe Analysis. These subjects are preparatory to the work in Determinative Mineralogy. In Crystallography the aim is to give the student the fundamentals of the subject and to require him to become thoroughly familiar with the common crystal forms. Blowpipe Analysis is a rapid and useful method of ascertaining all, or a part, of the elements present in minerals.

Prerequisites: Chem. 100 and 101. Sophomore year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00.

112. Determinative Mineralogy. A study of the more important mineral species, special emphasis being placed upon the determination of the various minerals. The student becomes familiar with their appearance, association and uses; and is able to determine them accurately and rapidly by their physical and chemical properties.

Prerequisite: Geol. 111. Sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00.

135. General Geology. A study of the composition, structure, and history of the earth and of the forces instrumental in producing or changing the surface configuration and the crustal formation. Emphasis is given to the chief processes by which the accessible rocks of the earth have been formed and evolved into their present condition. Practice in the interpretation and construction

of geologic and topographic maps is given. A summary of the historical geology and stratigraphy of North America is also presented.

Junior year; first semester; 3 credits; 3 lectures or recitations; 1 laboratory period for School of Mines students. Elective in other courses. Fee \$1.00.

137. Petrology. A study of rocks, treating of their origin, mode of occurrence, and alteration. The course is intended to familiarize the student with the characteristics of the commoner rocks so that he may identify them in the field. Special emphasis is laid upon the numerous petrologic facts and principles which bear an immediate relation to mining operations.

Prerequisites: Geology 112 and 135. Junior year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00.

139. Petrography. A more advanced course in Petrology. The optical properties of the rock-forming minerals and the characteristics of the principal rock types are studied with the aid of thin sections and polarizing microscope. Type collections with their corresponding rock sections are available, and the student has the opportunity to supplement field determinations with the exact knowledge gained through the use of the microscope.

Prerequisite: Geol. 137. Junior year; second semester; 2 credits; (for those specializing in Geology 3 credits); 1 recitation; 2 or 3 laboratory periods. Fee \$1.00.

155. Historical Geology and Stratigraphy. Lectures on the origin and history of the earth and the plants and animals that have inhabited it. An outline of invertebrate paleontology is presented, and the student is familiarized with the principles on which is based the determination of the age of fossiliferous rocks by means of "faunal groups," and by the recognition of characteristic species. A part of the scheduled recitation periods is utilized for laboratory work.

Prerequisites: Geol. 135 and 137. Elective; first semester; 3 credits; 3 recitations.

156. Geology of the Igneous Rocks. A course designed for graduate or advanced students dealing with the origin of igneous rock bodies. Such subjects as magnetic differentiation, the mechanism of intrusive and extrusive action are discussed in detail, and special attention given to those subjects that have an important

technical bearing, such as contact metamorphism, magmatic waters, gaseous emanations, etc.

Prerequisite: Geol. 139. Elective; second semester; 3 credits; 3 recitations. Texts: R. A. Daly, *Igneous Rocks and Their Origin*. Harker, *The Natural History of Igneous Rocks*.

161. Forest Geology. The characteristics of the commoner minerals, rocks, and ores. The more important structural features of rocks and mineral deposits, and the criteria for recognizing the various types of ore deposits are studied. Practice in the interpretation of geologic and topographic maps is given to enable students to make use of these maps in the field.

Prerequisites: Chemistry 100 and 101. Required in Forestry course; optional in all others; freshman year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$1.00.

171. Agricultural Geology. A study of the origin and nature of soils, and the geologic processes which alter the surface of the earth; the origin and occurrence of underground water; occurrence of artesian basins; the location of wells; interpretation of topographic, geologic, and soil maps; geologic occurrence and uses of mineral fertilizers and road materials.

Prerequisites: Chem. 100 and 101. Elective in Agricultural courses; junior or senior year; first semester; 3 credits; 2 lectures; 2 laboratory periods. Fee \$1.00.

181. Ore Deposits. The principles of ore deposition. Given in the second semester of the senior year in order that all of the student's previous knowledge of geologic subjects may be brought into use in the study of ore deposits. The occurrence, origin, geologic relations, and classification of ore deposits are studied. The various type deposits as known in important mining camps are discussed. The student is required to write abstracts from the literature bearing on the subject. Considerable importance is attached to the accompanying laboratory work, which consists of mineralogic and petrologic study of rocks and ores from type deposits. A certain amount of time is devoted to a discussion of field methods, mine examination, etc.

Prerequisites: Geol. 135, 137, and 182. Senior year; second semester; 3 credits; 3 recitations; 1 laboratory period. Text: Lindgren, *Mineral Deposits*. Fee \$1.00.

182. Economic Geology of the Non-Metallics. A course intended to give to the student a knowledge of the economically im-

portant non-metallic substances, such as coal, clay, building stone, etc. Geologic occurrence and origin are carefully studied, particularly those characteristics affecting economic value. The student is required to prepare many abstracts from current literature. Considerable time is devoted to individual industries, such as the manufacture of clay products and of Portland cement. Special attention is given to market conditions and the factors affecting them.

Prerequisites: Geol. 135 and 137. Senior year; first semester; 2 credits; 2 recitations; 1 laboratory period.

184. Problems in Economic Geology. Practical problems in mining and field geology are worked out by the student in the laboratory and drafting room. Geologic, topographic, and mine maps are used, and many structural problems are studied, with special regard to their application in the development of mineral deposits.

Prerequisite: Geol. 182. Senior year; second semester; 2 credits; 2 laboratory or drafting-room periods. Fee \$1.00.

186. Interpretation of Geologic and Topographic Maps. A study of the representation of geologic and topographic data on paper. Interpretation of geologic maps and cross-sections and of topographic maps. Methods of platting geologic data on engineering plans. A large number of government and other geologic and topographic maps covering varied regions of the United States are studied in detail.

Elective for all juniors and seniors in the School of Mines, School of Engineering, and School of Forestry; second semester; 2 credits; 2 drafting-room periods. Fee \$1.00.

188. Oil Geology. A course in the geology of petroleum. Required of students registered for the degree in Mining Engineering (Geology). The course includes a study of the origin, geologic occurrence, geologic structure, and distribution of deposits of petroleum and natural gas, with special reference to the oil and gas fields of the United States, Mexico, and South America. Methods of exploring for oil, and methods of mapping geologic structure are studied, as well as various methods of recording and filing geologic data bearing upon the geology of oil and gas.

Prerequisite: Geol. 135. Senior year; first semester; 2 credits; 2 lectures or recitations; 1 laboratory period. Elective for seniors in all other courses in the School of Mines.

190. Field Geology and Geologic Surveying. An application of the principles and methods of geologic surveying. Attention is given to such phases as the use of the plane table and other instruments pertaining to this work. The student is assigned a small area and is required to make a geologic map and report based upon the results of his field work. A two weeks field trip is made to some mining locality showing a variety of geologic features.

Prerequisites: Geol. 135 and 137. Elective; first semester; 2 credits; 1 recitation; 4 hours in field and laboratory.

191. Engineering Geology. A course in general and applied geology for students in the School of Engineering, emphasizing those phases of the subject with which the civil, irrigation, and highway engineer should be familiar. The origin and nature of the materials of the earth; a review of geologic processes which modify the earth's surface; occurrence and nature of geologic structural and road materials; influence of structure of rocks on engineering projects; study of ground waters and effect on water supply and foundation sites; interpretation of geologic and topographic maps; occurrence of ores and other minerals of economic value.

Prerequisites: None. Elective; open to all juniors and seniors in the School of Engineering; first semester; 3 credits; 3 recitations or lectures; 1 laboratory period. Fee \$1.00. Text: Ries and Watson, Engineering Geology.

199. Practical Geology. Students in the School of Mines are required, before the senior year, to do at least two months practical work in mines, smelters, on geological surveys, in cement mills, clay works, or other industrial plants, closely related to the course being pursued. Evidence of the nature, quality, and sufficiency of this work will be passed upon by the proper department before credit is given. While the minimum requirement is two months, it is urged that the freshman, sophomore, and junior vacations be entirely devoted to industrial occupations along the student's chosen line. Insight into the technical subjects studied later, also an appreciation of their application to the conditions met in practice on a commercial scale, are thus gained.

CERAMIC ENGINEERING

IRA ABRAHAM WILLIAMS, Professor

The course of instruction in Ceramic Engineering is designed to prepare young men to make intelligent search for suitable raw materials, to test them properly, and to aid in their economic exploitation and development. At the outset, therefore, ceramic students are required to take substantial courses in the basic sciences, chemistry, mathematics, physics, geology, and the preliminary engineering subjects required of other students in the School of Mines.

Work in the subjects distinctive of the course is confined to the last two years, and includes lectures and laboratory instruction and practice in the processes and methods of manufacture of ceramic wares, including, besides the commoner clay products, pottery and porcelain, and the compounding and application of glazes, enamels, cements, etc. Both the materials used and the finished articles will be studied and tested. The physical and chemical principles on which the production and value of ceramic products are based are presented thoroughly, and the student is shown that successful manufacture depends upon a full knowledge and constant application of these principles.

Equipment. The Ceramic Engineering laboratory occupies a room about 30 by 60 feet in the basement of the Mines building. There are also store and supply rooms contiguous to this laboratory. The equipment for the ceramic engineering work consists of a laboratory for ceramic chemistry and apparatus for making physical tests of clays and other ceramic materials; a complete mechanical outfit for the preparation of clays for the manufacture of brick, tile, terra-cotta, etc., and equipment for the compounding of bodies, glazes and enamels for stone- and iron-ware, and all of the higher grade of pottery and of porcelain products. This outfit includes a combination dry-wet-pan, pug mill, blunger, filter press, ball mills, and other grinding machines, rolls, screenes, potter's wheel, and an auger machine provided with dies for side- and end-cut brick, hollow block, drain tile, and roofing tile; a hand-power screw press with dies for dry press brick and flat tile; and an electric furnace for high temperature work.

In the ceramic engineering laboratory are two kilns, a down-draft, burning crude petroleum, and a Caulkins muffle pottery kiln;

a steam dryer in which drying conditions can be accurately controlled; an electric and a radiation pyrometer; Seger volumeter; balances, and other necessary apparatus.

A ceramic library, which contains the best works in both English and foreign languages, and a ceramic museum are also important features of the working equipment of the department.

DEGREE COURSE IN CERAMIC ENGINEERING

The freshman and sophomore years are identical with the first two years of the Degree Course in Mining Engineering.

	Semester	
	1st	2nd
Junior Year		
Statics and Dynamics (M. E. 251).....	5	
Strength of Materials (M. E. 252).....		3
Hydraulics (I. E. 102).....		3
Electrical Machinery (E. E. 402).....		4
General Metallurgy (Met. 402).....	3	
General Geology (Geol. 135).....	3	
Petrology (Geol. 131).....		2
Ceramic Chemistry (Cer. E. 301).....	3	
Ceramic Raw Materials (Cer. E. 303).....	3	
Raw Materials Testing (Cer. E. 310).....		2
Ceramic Calculations (Cer. E. 312).....		1
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
	<hr/>	<hr/>
	19	17

Senior Year		
Technical English (Eng. 141).....	3	
Power equipment (Min. E. 231).....		3
General Engineering Laboratory (Exp. E. 210).....	2	
Economic Geology (Geol. 182).....	2	
Manufacture of Clay Products (Cer. E. 321).....	4	
Clay Products Laboratory (Cer. E. 322).....		3
Limes and Cements (Cer. E. 326).....		3
Glasses, Glazes, and Enamels (Cer. E. 323).....	4	
Ceramic Engineering Laboratory (Cer. E. 324).....		2
Field Work and Report (Cer. E. 328).....		1
Thesis (Cer. E. 330).....		4
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	15	16

The following courses are offered:

301. Ceramic Chemistry. Analysis of clays, glasses, glazes, and silicate minerals. Chemical study of fire gases.

Prerequisites: Chem. 301 and 401. Junior year; first semester; 3 credits; 3 laboratory periods. Deposit \$5.00.

303. Ceramic Raw Materials. The occurrence, properties identification, and winning of clays and other ceramic materials.

Prerequisite: Completed work of the freshman and sophomore years. Junior year; first semester; 3 credits; 3 recitations; 3 laboratory periods.

310. Raw Materials Testing. Continuation of the laboratory work of Cer. E. 303. Lectures at intervals as required.

Prerequisites: Cer. E. 303 and Chem. E. 471. Junior year; second semester; 2 credits; 2 laboratory periods.

312. Ceramic Calculations. Calculations involved in the blending of raw materials for pottery bodies, glazes, cements, etc. Practical ceramic problems.

Prerequisites: Cer. E. 303 and Chem. E. 471. Junior year; second semester; 1 credit; 1 recitation.

321. Manufacture of Clay Products. Principles of the manufacture of clay wares, and the equipment used in drying and burning.

Prerequisite: Completion of the first three years of the Ceramic Engineering Course. Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods.

322. Clay Products Laboratory. Continuation of the laboratory work of Ceramic Engineering 321. Lectures at intervals as required.

Prerequisite: Cer. E. 321. Senior year; second semester; 3 credits; 3 laboratory periods.

323. Glasses, Glazes, and Enamels. Classification, production, properties, and defects. Methods of application to ceramic wares.

Prerequisites: Cer. E. 303 and 312; Chem. E. 471. Senior year; first semester; 4 credits; 3 recitations; 2 laboratory periods. Deposit \$2.00.

324. Ceramic Laboratory. Continuation of the laboratory work of Ceramic Engineering 323. Lectures at intervals as required.

Prerequisite: Cer. E. 323. Senior year; second semester; 2 credits; 2 laboratory periods. Deposit \$5.00.

326. Limes and Cements. Lime, cement, plaster, and other cementing materials, and sand-lime products. Production, properties, and uses.

Prerequisites: Chem. 301 and 401. Senior year; second semester; 3 credits; 3 recitations.

328. Field Work and Report. Visits to cement, clay, and other related industrial plants; carefully written reports.

Prerequisites: Cer. E. 322 and 326. Senior year; second semester; 1 credit; 1 laboratory period.

330. Thesis. A careful study of some special ceramic problem.

Prerequisite: Completion of all ceramic courses offered before the second semester of the senior year.

Senior year; second semester; 4 credits; 4 laboratory periods. Deposit \$5.00.

399. Practical Work in Ceramics. For a description of this course, see Min. E. 299.

With the consent of the heads of the departments interested, students may be admitted to the ceramic courses from the other departments in the School of Mines, and from the School of Engineering and Mechanic Arts.

SCHOOL OF PHARMACY

ADOLPH ZIEFLE, Dean

* IRWIN LEONARD BETZEL, Instructor

FRANCOIS ARCHIBALD GILFILLAN, Instructor
Assistant

Success in Pharmacy depends to a great extent on what preparation one makes for his work in the formation of correct habits of economy coupled with industry. The importance of a scientific training in pharmacy cannot be overestimated. This is true both as regards the pharmacist and the public, for the dispenser of medicines must be held responsible for the purity and strength of his preparations. The necessary education for conducting a modern pharmacy cannot be secured in a drug store alone, however valuable the experience gained therein may be. It is clearly evident that suitable preparation for the life-work of the practical pharmacist can only be given to one who has the necessary practical experience, as well as the proper educational training.

State boards of pharmacy, recognizing the importance of scientific pharmaceutical training, are requiring it in addition to a definite amount of practical drug-store experience as a prerequisite for registration.

Of late years the demand for educated pharmacists has been more urgent than ever before, on account of the enactment of State and National Pure Food and Drug Laws, as well as other laws that regulate the sale of medicinal substances. For these reasons, it is necessary that pharmacists adjust themselves to public sentiment, which expects pure drugs and medicines and competent persons to manufacture and dispense them. These requirements can only be attained through pharmaceutical education.

The necessary knowledge of the sciences on which the art of pharmacy is based and the technical skill required to practice that art, are best acquired in a well-equipped school of pharmacy. From the fact that very little teaching is done in drug stores, it becomes necessary for the successful pharmacist to have college training in order accurately to prepare medicines and dispense prescriptions. Aside from this, it often becomes necessary to identify drugs, detect accidental poisoning and to determine whether drugs are fit to be used in prescription work.

* On leave of absence for service in war work.

It is this kind of training that the department of Pharmacy at the Oregon Agricultural College is prepared to give. The department is conveniently located in Science Hall and the eight rooms that are used for instruction in the strictly pharmacy subjects are very well equipped to give the proper instruction. The courses in pharmaceutical chemistry are given in the department of Chemistry which is also located in Science Hall.

One of the main objects of all young pharmacists is to pass a creditable examination before the State Board of Pharmacy. Preparation for such examinations is a special feature of the work of the department and its graduates have been most successful. Aside from enabling students to pass the pharmacy examination, however, the aim of the department is to afford an opportunity to obtain a thorough technical training that will equip the student for a life of efficient service in the profession of pharmacy from the practical point of view.

The courses of study meet the highest requirements of pharmaceutical instruction. The facilities for work are such that students who are interested can become most proficient in the manufacture and dispensing of drugs. The time spent in scientific pharmaceutical training will result beneficially for the people and to the profession of medicine in which pharmacy occupies a separate and distinct field.

Since the pharmacy curriculum requires more chemistry than any other course in the College, it is possible for students in pharmacy and special students to major in chemistry by electing the course in preparation for any position they have in mind. Graduates are constantly being sought by retail pharmacists as prescription dispensers, by manufacturing and wholesale druggists, by departments executing Federal and State Pure Food and Drug Laws, where they serve as chemists and inspectors.

Oregon is especially adapted to the cultivation of medicinal plants and it is only a question of time when the growing of drugs will prove to be a commercial enterprise for the State. The department of Pharmacy is especially fortunate in being able to give instruction along the line of drug cultivation. This is one of the features of the course in Pharmacognosy, a course in which students are taught to identify, cultivate, preserve, and understand all vegetable drugs.

Courses of Instruction. Three courses of instruction are offered; namely, Graduate in Pharmacy (Ph. G.), requiring two year's work, Pharmaceutical Chemist (Ph. C.), requiring three year's work, and Bachelor of Science in Pharmacy (B. S. Pharm.), requiring four year's work. In addition to these courses students may take work leading to the degree of Master of Science in Pharmacy.

A two-years course leading to the degree of Graduate in Pharmacy (Ph. G.) is offered, comprising the more professional studies of the curriculum. It prepares directly for drug-store and dispensing practice and provides a groundwork in analytical chemistry necessary for the drug business and the various phases of pharmaceutical manufacturing.

A three-years course leading to the degree Pharmaceutical Chemist (Ph. C.) is designed especially for those who wish to enter the commercial field of pharmaceutical chemistry, medical chemistry, or food and drug analysis. The third year is devoted to advanced subjects not given in the two-years course. Graduates of this course specializing in bacteriology and chemistry are eligible to the Sanitary Corps of the United States Army, where they become commissioned officers after taking the courses of instruction.

By electing special courses such as physics, modern language, and biology, students electing the three-years course can complete all important courses in Pharmacy and Chemistry as well as all pre-medical work required for entrance in all schools of medicine. Those of our graduates who have become practicing physicians are unanimous in declaring that their course in Pharmacy has been of great value to them in their medical practice.

Although it is impossible to publish an outline of the three-years course in this issue of the College catalogue, a complete outline will be printed in the bulletin of the School of Pharmacy published at a later date which may be had on request.

Certain courses such as quantitative inorganic chemistry, bacteriology, and physiological chemistry will be required. Students will be allowed the privilege of electing such other courses as will fit them for the kind of work they wish to take up after graduation.

A four-years course is academic and professional, leading to the degree of Bachelor of Science (B. S.). This is the most satisfactory course to elect, because it gives a broad collegiate training supplemented with the professional work of the two-years course. This course also includes thorough work in Bacteriology, Zoology,

Botany, Food and Drug Chemistry, and Physiological Chemistry. Many students who have completed the work of this degree have continued their study in schools of medicine. The entrance requirements for the above courses are the same as for other degree courses of the College.

Students Not Candidates for Degrees. The facilities of the School of Pharmacy are not denied to those drug clerks and students who cannot meet the entrance requirements in the courses leading to the above degrees. Such students will be admitted as specials, not candidates for degrees, upon approval of the Dean and Registrar.

Students preparing to study Chemistry, Dentistry or allied subjects will find the course in Pharmacy especially well adapted for entrance to professional schools. Arrangements can be made whereby the student may elect such courses from the curriculum as are necessary to meet certain requirements.

Admission of advanced students: Students entering from collegiate departments of other colleges and universities must bring a certificate of honorable dismissal. Upon presentation of the proper credentials they will receive advanced credit for courses taken in institutions whose entrance requirements and character of work are equivalent to those of this department.

Equipment. The department's lecture rooms and laboratories are in Science Hall, a building which conveniently meets the needs for space, light, and ventilation.

The laboratories and lecture rooms are well equipped with all requirements necessary for practical instruction in pharmaceutical manipulation. Each laboratory is thoroughly equipped for a definite kind of work and the stock of the department is so complete that students have every opportunity to do efficient work. Students have individual desks supplied with a complete set of apparatus. Nearly all stock used by students is found on side shelves directly in the laboratory. All drugs not found on side shelves are obtained from the stock which is in charge of an assistant at all times during laboratory periods. This system for the distribution of drugs and apparatus to students works for the highest efficiency. Much of the student's time is saved thereby.

In addition to the usual permanent fixtures and apparatus for individual students, the department is supplied with a number of pieces of special apparatus for common use, such as pharmaceutical

stills, tablet and pill machines, suppository machines, filter presses, and all of the apparatus that is necessary for thorough instruction in pharmacy. The prescription room is really a model drug store, containing accurate balances, capsule fillers, con seal molds, and such other apparatus as is necessary. The room for commercial pharmacy is equipped for sign-card painting and window dressing. Special tables for frames have been built for the work and each desk is supplied with compressed air for work with the air brush. The pharmacognosy room contains many cabinets filled with crude drugs, active principles, and many preparations. There is also the Eli Lilly & Co. exhibit of authentic crude drugs and preparations.

The pharmacy library contains the leading pharmaceutical journals, which are kept on file and are accessible to students. Students also have access, with certain restrictions, to all standard reference books on materia medica, chemistry, and pharmacy.

DEGREE COURSE IN PHARMACY

	Semester	
	1st	2nd
Freshman Year		
Modern English Prose (Eng. 81, 82).....	3	3
General Chemistry (Chem. 105, 106).....	5	2
Qualitative Analysis (Chem. 300).....		3
General Zoology (Zool. 101, 102).....	3	3
Pharmaceutical Botany (Bot. 70, 71).....	3	4
Elementary Pharmacy (Phar. 102, 103).....	1	1
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	$\frac{1}{2}$	$\frac{1}{2}$
Library Practice (Libr. 1).....	$\frac{1}{2}$	
Hygiene (Phys. Ed. 19).....	$\frac{1}{2}$	
	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Sophomore Year		
Organic Chemistry (Chem. 201, 202).....	3	3
Quantitative Analysis (Chem. 400).....	4	
Zoology (Zool. 201, 202).....	3	3
Pharmaceutical Latin (Phar. 104).....	2	
Modern Language (French, German, or Spanish).....	3	3
Principles of Economics (Com. 210).....		3
Business Law (Com. 311).....		3
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	16 $\frac{1}{2}$	16 $\frac{1}{2}$

	Semester	
	1st	2nd
Junior Year		
Theoretical Pharmacy (Phar. 116).....	3	
Pharmacy Bacteriology (Bact. 201, 202).....	3	3
Modern Language	3	3
Practical Pharmacy (Phar. 117).....		3
Pharmaceutical Preparations (Phar. 118).....		2
Pharmacognosy (Phar. 130, 131).....	3	2
Inorganic Pharmacy (Phar. 121).....	3	
Alkaloidal Testing, Drug Assaying (Chem. 404, 405).....	2	2
Pharmaceutical Calculations (Phar. 123).....		2
Military Science (Theo. Inst. 1, 2).....	1	1
Drill (Military 5, 6).....	1	1
	<hr/> 18	<hr/> 18

Senior Year		
Composition of Addresses (Eng. 103, 104).....	2	2
Materia Medica and Toxicology (Phar. 140, 141).....	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115)	3	3
Food and Drug Analysis (Chem. 304).....	3	
Prescription Lectures (Phar. 150).....	3	
Prescription Incompatibilities (Phar. 151).....		3
Prescription Compounding (Phar. 152).....		2
Manufacturing Pharmacy (Phar. 170).....	2	
Physiological Chemistry (Chem. 409).....		3
	<hr/> 16	<hr/> 16

TWO-YEARS COURSE IN PHARMACY *

	Semester	
	1st	2nd
General Chemistry (Chem. 105, 106).....	5	2
Qualitative Analysis (Chem. 300).....		3
Pharmaceutical Latin (Phar. 104).....	2	
Inorganic Pharmacy (Phar. 121).....	3	
Pharmacognosy (Phar. 130, 131).....	3	2
Theoretical Pharmacy (Phar. 116).....	3	
Practical Pharmacy (Phar. 117).....		?
Pharmaceutical Preparations (Phar. 118).....		2
Pharmaceutical Calculations (Phar. 123).....		2
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	1½	½
Elective		2
	17½	17½

* This course leads to the degree of Graduate in Pharmacy. Students entering the course must have completed the full four-years high-school training.

Second Year

Organic Chemistry (Chem. 201, 202).....	3	3
Materia Medica and Toxicology (Phar. 140, 141).....	3	3
Pharmacopoeia and National Formulary (Phar. 114, 115).....	3	3
Prescription Lectures (Phar. 150).....	3	
Prescription Incompatibilities (Phar. 151).....		3
Prescription Compounding (Phar. 152).....		2
Manufacturing Pharmacy (Phar. 170).....	2	
Alkaidoidal Testing, Drug Assaying (Chem. 404, 405).....	2	2
Drill (Military 3, 4).....	1	1
	17	17

The following descriptions are for the strictly pharmacy subjects, all courses in pharmaceutical chemistry are outlined in the chemistry schedule.

The following courses are offered:

102. **Elementary Pharmacy.** This course deals with: history of pharmacy and its development, standard pharmaceutical literature, demonstration of apparatus, and other elementary phases of

pharmacy. The aim of the course is to give new students an idea of the subject by showing the relation of the various scientific courses in the pharmacy curriculum to each other.

Freshman year; first semester; 1 credit; 1 lecture. Text: Stevens, Pharmacy.

103. Elementary Pharmacy. A continuation of course 102 but deals with more advanced subjects in preparation for the courses in Pharmaceutical Latin and Theoretical Pharmacy.

Prerequisite: Phar. 102. Freshman year; second semester; 1 credit; 1 lecture. Text: Stevens, Pharmacy.

104. Pharmaceutical Latin. Latin is the language of science and all properly trained pharmacists need some knowledge of the principles of Latin etymology and construction in order to understand the use and terminology of pharmacy and medicine. The following subjects are made the basis of systematic study in this course: Latin abbreviations as used by physicians, Latin endings of drugs and medicines, prescription Latin, and English translation of all Latin terms used in pharmacy.

Sophomore year; first semester; 2 credits; 2 recitations. Text: Sturmer, Pharmaceutical Latin.

114. United States Pharmacopoeia and National Formulary. The object of this course is to apply the principles of all fundamental scientific courses such as, chemistry, materia medica, pharmacognosy, etc., to the subject of pharmacy. The Pharmacopoeias, Dispensatories, and National Formulary are the text-books used, and students are required to become very well informed as to the composition, uses, and methods of preparation of all official and unofficial remedies, as well as those newer remedies that are used most frequently. All strictly pharmacy courses are reviewed in preparation for the State Board of Pharmacy examination. Several intermediate examinations will be held, and the instructors will thus be enabled, by returning proper suggestions and directions, to aid students materially in equipping themselves for any pharmacy examination. Typical representative State Board questions will be used as a guide in preparing for the examination. There will be frequent reviews in identification of drugs and their preparations, as well as the careful systematization of all pharmacy subjects to permit of frequent reviews.

Prerequisites: Phar. 117, 118, Chem. 300, 201, 202. Senior year; first semester; 3 credits; 3 recitations. Text: U. S. Pharmacopoeia and National Formulary.

115. United States Pharmacopoeia and National Formulary.

This is a continuation of course 114. As a special feature of the work, however, all scientific journals and state bulletins are reviewed, in order to familiarize students with the trend of State and National Pure Food and Drug work, as well as the various laws regarding the sale of drugs. The newer remedies are studied from the point of view of their composition, use, and incompatibilities. Other subjects of equal importance are discussed, the aim of the work being to prepare students for the actual needs in pharmacy.

Prerequisite: Phar. 114. Senior year; second semester; 3 credits; 3 recitations. Texts: U. S. Pharmacopoeia and National Formulary.

116. Theoretical Pharmacy. This course will begin with lectures defining pharmacy and allied sciences, and will embrace a study of the nomenclature of Pharmacopoeias and their importance as standard for drugs. Then will follow in order, lectures and demonstrations dealing with the principal processes employed in operative pharmacy; viz, weights and measures, heat, distillation, sublimation, extraction in its various forms, and other methods used in the manufacture of galenical preparations.

Prerequisites: Registration in Chem. 105 and Phar. 130. Junior year; first semester; 3 credits; 3 recitations. Text: Army, Principles of Pharmacy.

117. Practical Pharmacy. The natural products used in pharmacy are carefully defined and demonstrated. Then follows a study of the various classes of preparations such as: waters, sirups, tinctures, extracts, etc. Each class is defined and the various methods used in their preparation are illustrated and discussed. All preparations of the U. S. Pharmacopoeia are studied, particular attention being given to their constituents, percentage strength, method of preparation and reasons for each step, equations and synonyms.

Prerequisites: Phar. 116, Chem. 105. Junior year; second semester; 3 credits; 3 recitations. Texts: Army, Principles of Pharmacy. Ruddiman, Why's in Pharmacy.

118. Pharmaceutical Preparations. The object of this course is to teach students to put into practice the principles of Theoretical Pharmacy. While the student's work is individual, constant supervision of the instructor prevents inaccuracies and error in conception, and in this way wrong methods can be corrected. The

work will embrace the determination of specific gravities by various methods, comparison of weights and measures, standardization of graduates and the tying and wrapping of carefully weighed packages. The main feature of the course, however, is accurately to prepare small amounts of the simpler preparations such as: waters, liquors, emulsions, pills, suppositories, etc.

The galenicals made are carefully inspected and at definite times identification examinations are held, at which time students are required to identify all preparations made and all ingredients used in their manufacture.

Prerequisites: Registration in Phar. 117 and Chem. 105. Junior year; second semester; 2 credits; 2 three-hours laboratory periods. Text: U. S. Pharmacopoeia. National Formulary. Laboratory Notes. Fee \$6.00. Deposit \$1.00.

121. Inorganic Pharmacy. This course deals with a study of official and unofficial inorganic drugs. The lecture work consists of a study of the elements and their compounds that are used in medicine. Their source, method of preparation, formulae, synonyms, physical and chemical characteristics are made the basis of systematic study. In the laboratory representative samples of each type of chemical will be made and samples of all official inorganic drugs will be supplied to each student for identification study.

Prerequisites: Registration in Phar. 116 and Chem. 105. Junior year; first semester; 3 credits; 2 lectures and 2 two-hours laboratory periods. Text: Army, Principles of Pharmacy. Fee \$4.00.

123. Pharmaceutical Calculations. The various forms of calculations that are common to pharmacy are made the subject of systematic study; viz., equivalents of each system of weights and measures, calculation of proportionate parts of a formula, percentage solutions, specific gravity, alligation, and such chemical calculations as are met with in pharmacy.

Prerequisites: Phar. 116, Chem. 105. Junior year; second semester; 2 credits; 2 recitations. Text: Stevens, Pharmaceutical Arithmetic.

130. Pharmacognosy. This course deals with the macroscopical examination and study of official and unofficial animal and vegetable drugs. All drugs are properly classified in respect to their habitat, botanical order, constituent, synonyms, medicinal uses, and preservation. Frequent identification examinations are

given so that students must become thoroughly familiar with the physical characters of drugs as well as their use.

Prerequisites: Registration in Phar. 104, 121, 116. Junior year; first semester; 3 credits; 3 recitations. Texts: Culbreth, *Materia Medica*. Schlotterbeck, Syllabus. Lilly, *Organic Drugs*. Fee \$1.00.

131. Pharmacognosy. A continuation of course 130 and the use of typical State Board of Pharmacy questions to supplement the work in preparing to become registered pharmacists. A special feature of the work of this course is the instruction in growing drugs on a commercial scale. Lectures and demonstrations will be given on preparation of soil, planting of seed, the care of drug plants, collection and preparation for market.

Prerequisite: Phar. 130. Junior year; second semester; 2 credits; 2 recitations. Texts: Culbreth, *Materia Medica*. Schlotterbeck, Syllabus. Lilly, *Organic Drugs*. Fee \$1.00.

140. Materia Medica and Toxicology. Lectures and recitations on the properties, physiological actions, uses, and doses of all chemical, animal, and vegetable drugs, and their preparations. The different types of drugs are studied in groups according to their physiological action. The peculiar terms used to classify drugs according to their action and uses are carefully defined. The subject of toxicology receives especial attention from the point of view of absorption, elimination, and cumulative action of poisonous substances. The signs and symptoms are studied in each case, and the antidote and medicinal treatment receive attention.

Prerequisites: Phar. 117, 118, and Chem 201, 202. Senior year; first semester; 3 credits; 3 recitations. Texts: Tyrode, *Pharmacology*. Stearns, *Dose Book*. Fee \$1.00.

141. Materia Medica and Toxicology. A continuation of course 140. After the entire subject has been covered, preparation for the State Board of Pharmacy examination and the practical use of the subject follows. Each student will be required to familiarize himself with State pharmacy and drug laws, as well as other laws that regulate the manufacture and sale of drugs. The latter part of the course consists of lectures and laboratory work on First Aid to the Injured. Pharmaceutical jurisprudence is considered from the point of view of the trend of recent legislation affecting pharmacists, legal limits of pharmacy, liability of the seller of drugs, expert witness and all other phases of this subject.

Prerequisite: Phar. 140. Senior year; second semester; 3 credits; 3 recitations. Texts: Tyrode, Pharmacology. Stearns, Dose Book. Fee \$1.00.

150. Prescription Lectures. This course deals with the technical study of all phases of the prescription. It embraces particularly the very important subject of pharmaceutical, chemical, and therapeutical incompatibilities. The aim of the course is to give such theoretical instruction as will enable the student to devise the best method of compounding prescriptions in order that the mixture will be safe and represent what the physician wants. Each class of prescriptions is studied, particular attention being given to the art of preparing elegant remedies. Ambiguous prescriptions are read in class, and the question of overdose of such drugs that might prove to be poisonous is also studied.

Prerequisites: Phar. 117, 118; Chem. 300, 201, 202. Senior year; first semester; 3 credits; 3 recitations. Text: Scoville, Art of Compounding.

151. Prescription Incompatibilities. This is a continuation of course 150, the chief subject being that of incompatibilities. Several hundred different prescriptions are studied from the point of view of compounding the various ingredients of remedies in the best sequence. The literature is carefully abstracted in order that students may become familiar with the manner of compounding the newer remedies that are not found in Pharmacopoeias. The aim of the work of this course is to teach students to detect dangerous prescriptions and to overcome incompatibilities.

Prerequisite: Phar. 150. Senior year; second semester; 3 credits; 3 recitations. Text: Ruddiman, Incompatibilities in Prescriptions.

152. Prescription Compounding. In this course students are expected to apply the principles of Prescription Lectures to the actual compounding of prescriptions. Many difficult and obscure prescriptions are submitted to students, who are called upon to deal with them as they deem best. In this way their ability as well as their knowledge is tested and if not accurate is corrected at once. The work of this course also deals with all the details of managing the prescription counter. The latter part of the course deals with perfecting of formulas for toilet preparations. Instruction is also given in the repair and making of mirrors, repair of apparatus, and other necessary operations common to a pharmacy.

Prerequisites: Phar. 150, 151; Chem. 201, 202, 300. Senior year; second semester; 2 credits; 2 three-hours laboratory periods. Text: Scoville, Art of Compounding. Fee \$6.00. Deposit \$1.00.

160. Commercial Pharmacy. The aim of this course is to give students an idea of the requirements of an efficient manager of a pharmacy. Regular topics relating to the commercial phase of pharmacy are discussed, such as planning and arrangement of a pharmacy, keeping up stock, salesmanship, window trimming, etc. A special feature of the course is the work in sign-card painting including extensive work with the air brush. For students not registered in the department the work is exclusively sign-card painting.

Elective; first semester; 3 credits; 1 recitation and two laboratory periods. Fee \$3.50.

161. Commercial Pharmacy. A continuation of course 160 with the added feature of taking of inventory, price lists, study of druggists sundries, side lines and air brush work. At definite times during the course successful business men will deliver lectures on the commercial side of pharmacy. For students not registered in the department, the work is exclusively sign-card painting.

Elective; second semester; 3 credits; 1 recitation; 2 laboratory periods. Fee \$3.50.

170. Manufacturing Pharmacy. This course is a continuation of the course on Pharmaceutical Preparations and deals with the manufacture of the more difficult pharmaceuticals that involve chemical reactions. The work is most exacting and requires a thorough knowledge of chemistry. As examples of the kind of preparations made, the following are mentioned; viz., spirits of nitrous ether, iodoform, ferrous iodide preparations, etc.

Prerequisites: Phar. 117, 118. Senior year; first semester; 2 credits; 2 three-hours laboratory periods. Text: U. S. Pharmacopoeia. Fee \$6.00. Deposit \$1.00.

SCHOOL OF VOCATIONAL EDUCATION

EDWIN DEVORE RESSLER, Dean

The chief function of the School of Vocational Education is to train teachers for the following vocations: agriculture, commerce, home economics, and the trades and industries. The School also offers opportunities for all teachers and students in the College to secure professional improvement with regard to teaching and related lines of service such as extension work.

There is a special demand at this time for vocational teachers who are able to meet the standards set by the State Board for Vocational Education to meet the requirements of the Smith-Hughes Act. Teachers meeting these requirements, and securing positions under direction of the State Board, receive one-half their salaries from Federal funds. The School of Vocational Education has been designated by the Board to receive Federal funds for the training of such teachers.

In the training of teachers for these vocations, emphasis must be placed upon the acquiring of technical knowledge and the development of skill; hence it is necessary for students to secure such training in the School that represents the field in which they are intending to teach. Inasmuch as this training will constitute the major portion of an under-graduate course, it is necessary for students to register and take their degrees in the school representing the subject they will teach. Prospective teachers of agriculture will take an agricultural course with their major in agricultural education; of home economics, a course in home economics with home economics education as a major; of commercial subjects, a commercial course with their major in commercial education; if manual training, the course in industrial arts.

Since the Institution does not give training for all of the trades and industries, it will be necessary at the present time for the department of Industrial Education to bend a great deal of its effort in the direction of giving professional training to teachers in service and to men and women who have acquired knowledge and developed skill in the trades they propose to teach.

Graduate Courses. Graduates of any school in the Institution who have majored in any phase of vocational education, or graduates of this or any other standard college who have established a pro-

professional status in vocational education, may take graduate courses leading to the degree, Master of Science, in the particular lines of vocational education in which they may take their major work. Graduate courses will be arranged and directed by the professor in charge of the major work under the Committee on Graduate Students and Advanced Degrees.

Teaching as a Profession. Students are advised to consider carefully the selection of teaching as a vocation. Good scholarship and the ability to speak, spell, and write the mother tongue correctly are fundamental essentials. Personality, altruism, enthusiasm, professional aptitude, and above all, moral character, are demanded of the teacher. Positions cannot be guaranteed and none but capable candidates will be recommended.

The Oregon School Law grants a high-school teaching certificate to graduates who have taken fifteen credits in education. Students preparing as vocational teachers under the Smith-Hughes Act should become familiar with the State requirements for teachers of the particular vocation they are intending to teach.

EDUCATION

EDWIN DEVORE RESSLER, Professor
JESSE FRANKLIN BRUMBAUGH, Assistant Professor

This department gives general courses in education upon which courses in special methods are based. Elective courses in education are open to all students prepared to take them.

The following courses are offered:

100. Principles of Education. An introduction to the study of education, including a discussion of the meaning of education, its significance in the development of the race, its aims, its method, its functions; brief description of present foreign systems and a fuller account of our own; organization of the school, relations and duties of pupils, teachers, supervisors, and school board; problems of school management; conduct of classes and general method; all with particular reference to the special, vocational teacher.

Required of all students preparing to teach; junior year; either semester; 3 credits; 3 recitations.

110. Vocational Education. Arranged to meet the needs of those preparing to teach any phase of vocational education. History of vocational education; its function in a system of education; development in the United States; present status with special regard to the requirements of Federal aided schools and departments as provided by the Smith-Hughes Act.

Prerequisites: Ed. 100. Psy. 220. Required of all seniors in Vocational Education; either semester; 2 credits; 2 recitations.

111. Vocational Guidance. An investigation of the means and methods of assisting the pupils of the upper grammar grades and high school in studying the problem of their future vocations. Factors of individual aptitude, heredity, and other personal characteristics; means of discovering these factors through school and other agencies; studies of occupations with essential qualifications for success in leading types; value of "life career" motive in education; survey of state and local resources as guides to choice, etc. Lectures, reports on the extensive literature of vocational guidance and some practical experience with pupils, under the careful supervision of the instructor.

Elective for juniors and seniors; second semester; 2 credits; 2 recitations.

120. History of Education. A general review of the growth and development of education and its relation to the civilization of the times; particular attention given to the rise of industrial education in Europe and America, and its place in the social and political life of the country.

Sophomore or junior year; either semester; 3 credits; 3 recitations.

130. School Administration. A discussion and analysis of the American system of education, with an interpretation of the purpose and spirit of each division; problems of administration and teaching in the public schools; the correlation of the industrial branches with the other subjects in the curriculum. Lectures, reading, reports, and studies on the Oregon schools.

Prerequisites: Psy. 200. Ed. 100. Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

131. School Hygiene. A course in the health provisions requisite for the hygienic conduct of education. This includes a discussion of ventilation, heating, light, seating, physical exercise in the school room and on the playground, games, medical inspection, tests for physical defects, disinfection, quarantine, and other similar topics. Oregon laws relating to these matters will be studied, and the regulations of the State Board of Health and other State and local health authorities will be explained in detail. Advanced investigations in other states will also be presented and comparative studies made. Lectures, reports, and first-hand investigations on town and country school conditions, so far as practicable.

Prerequisites: Psy. 200. Ed. 100. Elective for advanced or graduate students; first semester; 2 recitations; 2 credits.

150. Research. Advanced or graduate students who are qualified by previous training or experience, may register for extended investigation of some specific problem in vocational education. The studies may be historical, either European or American; administrative; or in field of method. General government and state reports; publications by special commissions; reports of committees of educational organizations; contributions by departments of colleges and universities; educational and other periodicals; and original investigations into Oregon conditions, compose the material to be used. These studies will be assigned and outlined by the in-

structor and stated reports made from time to time by the student. Regular hours will be assigned the individual students and credit given according to the amount of work done.

Prerequisites: Psy. 200. Ed. 100. Elective for advanced or graduate students; first semester; 2 credits.

151. Research. Continuation of course 150.

Prerequisites: Psy. 200. Ed. 100. Elective for advanced or graduate students; second semester; 2 credits.

152. Research. As outlined in course 150.

Elective for advanced or graduate students; first semester; 4 credits.

153. Research. Continuation of course 152.

Elective for advanced or graduate students; second semester; 4 credits.

PSYCHOLOGY

JESSE FRANKLIN BRUMBAUGH, Assistant Professor

This department gives the foundation courses in psychology upon which the courses in education are built. Elective courses in psychology are also open to all students in the Institution prepared to take them.

The following courses are offered:

200. General Psychology. A study of general psychology by lectures, recitations, and reports; a description of the facts and laws of mental activities with applications to the ordinary affairs of life; demonstrations and experiments showing the relation of mental life to the nervous system; the significance of habit in conduct and character.

Required of all students preparing to teach. Junior year; either semester; 3 credits; 2 recitations; 1 laboratory period.

210. Educational Psychology. The application of the facts and principles of psychology to teaching; a study of the growth of the child mind and the relations of the various periods of educational organization; adaptation of courses of instruction, methods of teaching, discipline, and general school activities to the stages of the pupil's development; lectures, recitations, reports, and simple investigations.

Prerequisite: Psy. 200. Required of all students preparing to teach. Junior year, second semester; or senior year, first semester; 2 credits; 1 recitation; 1 laboratory period.

220. Vocational Psychology. This course is based upon such principles of general psychology as lead to further application of psychological laws to the active pursuits of life. It will cover the field of habit in relation to skill and economy, perception in relation to accuracy in space discrimination, color, weight, shape, and tactile sensations, motor response in relation to stimulation, co-ordination, and inhibition. The psychology of business as it develops in the relation of man to man, of trust and faith in human affairs and modes of activity, etc. This course is intended to furnish a foundation for courses in Vocational Education to follow.

Required of all students preparing to teach vocational subjects; junior year; either semester; 3 credits; 3 recitations.

230. Child Study. This includes the physical and mental characteristics of children and youth as contrasted with those of mature men and women. The relation of physical growth and development to the unfolding of mental powers; the instincts and their relation to the development of individuality, sense of responsibility to others, moral development, etc.; abnormalities; study and treatment of children as individuals and in class groups; and discussion of the social and economic implications as well as the psychological. Lectures, reports, and simple tests and records made by visitation of schools.

Prerequisites: Psy. 200, 210. Ed. 100. Elective for advanced or graduate students; second semester; 2 credits; 2 recitations.

AGRICULTURAL EDUCATION

HARRY PERCY BARROWS, Professor
PAUL VESTAL MARIS, Professor (Ext.)
WALTER KOENIG, Instructor

The function of this department is to train men and women as teachers of agriculture in the colleges and secondary schools; to train extension workers in agriculture, and to develop leadership in rural life and education. For the purpose of training teachers of vocational agriculture as provided by the Smith-Hughes Act and for training extension workers under the Smith-Lever Act the following general courses are offered:

COURSES IN AGRICULTURAL EDUCATION

For the prescribed courses in the freshman and sophomore years in the School of Agriculture, consult pages 79-80.

Junior Year	Semester	
	1st	2nd
Vocational Psychology (Psy. 220).....	3	
Principles of Education (Ed. 100).....		3
Rural Sociology (Econ. 252).....		3
Agricultural Economics (Com. 219).....	3	
Weeds and Poisonous Plants (Bot. 69).....		3
Introductory Entomology (Ent. 301).....	2	
Economic Entomology (Ent. 302).....		2
Elementary News Writing (Eng. 301).....	2	
Diseases of Live Stock (Vet. Med. 14).....		3
Shop Drawing (Ind. Arts 301).....		2
Manual Training (Ind. Arts 103).....	2	
Blacksmithing (Ind. Arts 153a).....	2	
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives in Agriculture.....	2	
	—	—
	18	18

Senior Year	Semester	
	1st	2nd
Vocational Education (Ed. 110).....	2	
Secondary Education in Agriculture (Agri. Ed. 300, 301)	2	2
Practice Teaching in Secondary Agriculture (Agri. Ed. 320)		3
Farm Management (Soils and Farm Mgt. 1)		3
General Farm Mechanics (Farm Mech. 1).....	3	
Practical Public Speaking (Eng. 105, 106).....	3	3
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Electives in Agriculture	5	4
	18	18

The following courses are offered:

300. Secondary Education in Agriculture. The principles of education as applied to the teaching of vocational agriculture in secondary schools. Aims, methods, and materials as adapted to the practical training of students over fourteen years of age are considered; including the organization of courses, the collection and use of illustrative and reference materials, and the various phases of class-room and laboratory instruction. Special emphasis is given the supervision of practical work upon the farm.

Prerequisites: Psy. 220. Ed. 100, 110. Required of all seniors in Agricultural Education; 2 credits; 1 recitation; 1 laboratory period.

301. Secondary Education in Agriculture. Continuation of course 300.

Prerequisites: Psy. 220. Ed. 100, 110, Agri. Ed. 300. Required of seniors in Agricultural Education; 2 credits; 1 recitation; 1 laboratory period.

320. Practice Teaching in Secondary Agriculture. Required of seniors in Agricultural Education; second semester; 3 credits; 3 double periods.

321. Practice Teaching in Secondary Agriculture. Facilities will be afforded students in agricultural education to extend the amount of practice teaching required in course 320.

Elective to seniors and graduates in Agricultural Education. Time and credit to be arranged.

350. Seminar in Agricultural Education. A discussion of special problems in the teaching of agriculture and in the administration of agricultural education which will be brought out in an effort to keep in touch with the progress of this phase of education. The seminar includes also a critical review of the current literature of the subject.

Required of graduate students in Agricultural Education. Elective for seniors in Agricultural Education. First semester; time and credit to be arranged.

351. Seminar in Agricultural Education. Continuation of course 350.

Required of graduate students and elective for seniors in Agricultural Education; second semester; time and credit to be arranged.

360. Educational Resources of the Rural Community. The special aim of this course is to prepare teachers for broader social service. The rural school, the farm home, the country church, farmers' organizations and other agencies for rural progress will be considered with a view of working toward a better correlation and a greater coöperation in effort for rural development. Special emphasis will be given the rural school as a community center.

Elective for seniors in any of the branches of industrial education; second semester; 2 credits; 2 recitations.

361. Extension Methods in Agriculture. The history, organization and methods of county agricultural agent work. Lectures, assigned readings, and practice in news writing, outlining program of work, drawing projects, chart making, conducting meetings, etc.

Elective to seniors in all agricultural courses; second semester; 2 credits; 2 recitations.

HOME ECONOMICS EDUCATION

AVA BERTHA MILAM, Dean of Home Economics
BERTHA DAVIS, Assistant Professor
LURA KEISER, Critic Teacher, Household Science
BARBARA MOORE, Critic Teacher, Household Art

The function of this department is to give professional training to prospective teachers and extension workers in home economics.

For the four-years courses leading to a degree in Home Economics see pages 311-313.

The following courses are offered:

400. Secondary Education in Home Economics. The principles of education as applied to the teaching of vocational home economics in secondary schools. Aims, materials, and methods as adapted to the practical training of students over fourteen years of age. Organization of courses and the various phases of class-room and laboratory instruction. Special emphasis will be given the supervision of practice work in the home.

Prerequisites: Psy. 220, Ed. 100. Required of seniors in Home Economics Education; either semester; 3 credits; 2 recitations; 1 two-hours laboratory period.

410. Survey Course in Home Economics. This is a survey course in the teaching of Home Economics to be given either after or parallel with Practice Teaching.

One recitation; 1 credit.

420. Practice Teaching in Household Art.

Prerequisites: Ed. 100. Psy. 200. H. E. Ed. 400. Required of seniors in Home Economics Education preparing to teach Household Arts; either semester; 3 credits.

430. Practice Teaching in Household Science.

Prerequisites: Ed. 100. Psy. 220. H. E. Ed. 400. Required of seniors in Home Economics Education preparing to teach Household Science; either semester; 3 credits.

INDUSTRIAL EDUCATION

FRANK HENRY SHEPHERD, Associate Professor
AMBROSE REUBEN NICHOLS, Critic Teacher

This department serves in directing the technical training of and in giving professional training to teachers of the trades and industries, manual training, and industrial arts. Since the Institution does not give training for all of the trades and industries, this department is bending a great deal of its effort in the direction of giving professional training to teachers in service and to men and women who have acquired knowledge and developed skill in the trades they expect to teach. Courses are given in Portland as well as in Corvallis. Those who are contemplating training for teaching the trades and industries should make inquiry concerning the particular line in which they may be interested. The Institution is prepared at the present time to give training in the following trades: printing, plumbing, foundry work, blacksmithing, carpentry, cabinet making, and machine-shop practice.

The following outline of a course in printing for teachers of that trade is a typical teachers-training course in this department.

TEACHER'S COURSE IN PRINTING

Freshman Year	Semester	
	1st	2nd
Modern English Prose (Eng. 81).....	3	
Technical Business English (Eng. 142).....		3
Practical Printers' Arithmetic (Math. 25).....	3	
Chemistry (Chem. 100, 101 to be arranged and applied)....	3	3
Art (Art 411)		3
Vocational Printing	5	5
Library Practice (Libr. 1).....		½
Physical Education (Phys. Ed. 11) for Men.....	½	
Drill (Military 1, 2).....	1	1
Gymnasium (Phys. Ed. 15, 16).....	½	½
	16	16

	Semester	
	1st	2nd
Sophomore Year		
Elementary News-Writing (Eng. 301).....	3	3
Engineering Physics (Phys. 1, 2).....	3	3
Physics (Phys. 1, 2).....		3
Farm Power Machinery (Farm Mech. 3).....		3
Typewriting (Com. 410).....	2	
Bookkeeping (Com. B).....		3
Vocational Printing	5	5
Shop Drawing (Ind. Arts 301).....	2	
Drill (Military 3, 4).....	1	1
Gymnasium (Phys. Ed. 17, 18).....	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$

Junior Year

Advanced News-Writing (Eng. 302).....	3	3
Vocational Psychology (Psy. 220).....	3	
Principles of Education (Ed. 100).....		3
Vocational Printing	5	5
Vocational Education (Ed. 110).....	2	
Elementary Industrial History (Com. K).....	3	
Labor Problems (Com. 213).....		3
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Approved Electives		2
	<hr/> 18	<hr/> 18

Senior Year

English (Campus Publications).....	3	3
Special Method in Industrial Education (Ind. Ed. 500)....	2	
Practice Teaching in Industrial Education (Ind. Ed. 501)		3
Vocational Printing	5	5
Business Law (Com. P).....	3	
Elementary Industrial Problems (Com. J).....	3	
Extempore Speaking (Eng. 104).....		3
Approved Electives	2	4
	<hr/> 16	<hr/> 18

The following courses are offered:

500. Special Method in Trades and Industries. This course deals with the organization, administration, and teaching of industrial subjects to conform to the requirements of the Smith-Hughes Act. An investigation into the values of different elements of selected trades or industries will be made for the purpose of arranging a well-balanced course of study and preparing a systematic program for the different classes. Plans for the school year, the semester or term, the project or job, and the lesson will be discussed. Time cards, job cards, blank forms, records, reports, and class records will be arranged for different lines of work to familiarize the student with up-to-date methods in modern shops and factories and to conform to the school law. Lectures, readings, discussions, and written reports.

Prerequisite or parallel course: Education 110 or its equivalent. Required of all seniors preparing to teach a trade or industry; first or second semester; 2 credits; 2 recitations.

501. Practice Teaching in Trades and Industries. The student will be required to arrange and submit definite plans and outlines of the subject, job, or lesson to be taught. Reports to the director, supervisor, or critic teacher will be made for the purpose of perfecting the student teacher in the technique of the trade of teaching. Teachers' meetings will be held at regular intervals for the discussion of class-room problems.

Prerequisites: Psy. 220. Ed. 100. Ind. Ed. 500. Required of all seniors preparing to teach a trade or industry; second semester; 3 credits.

510. Special Methods in Manual Training. A careful, detailed study of the public school course in Manual Training in its various relations. Model courses for both elementary and secondary grades are outlined with plans for desired equipment for shop and class-room. Lessons on typical subjects, observation and model lessons and practice teaching provide opportunity to apply principles to practice.

Prerequisites: Py. 220. Ed. 100. Industrial Arts; junior year; second semester; or senior year, first semester; 2 credits; 2 recitations.

511. Practice Teaching in Manual Training. Required of seniors in Industrial Arts.

Prerequisites: Psy. 220. Ed. 100. Ind. Ed. 510. Industrial Arts; senior year; first or second semester; 3 credits; 1 recitation; practice teaching.

512. Theory and Practice of Elementary Manual Arts. A course for supervisors who must arrange courses and supervise industrial arts in the lower grades. Investigation of the present trend of the manual arts movement; arrangement of a suggestive course of study; plan of equipment; ordering of supplies, etc.; sand-table projects, rug weaving, paper folding, thin wood work, and other forms of construction work for the first six grades of elementary school. Lectures, assigned readings, reports, and practical shop work.

Required in Industrial Arts; elective in other courses; junior or senior year; either semester; 2 credits; 1 recitation; 1 laboratory period.

COMMERCIAL EDUCATION

ELMER WALKER HILLS, Assistant Professor

The function of this department is to give professional training to prospective teachers of commercial subjects. Although the special courses now outlined are limited, opportunity will be afforded graduate students in Commerce and other qualified students to work on special problems relating to teaching.

COURSE IN COMMERCIAL EDUCATION

For description of degree course in Commerce see pages 180-183 of this Catalogue. The following outline represents the work suggested in the junior and senior years for those who are to teach commercial branches.

	Semester	
	1st	2nd
Junior Year		
Vocational Psychology (Psy. 220).....	3	
Educational Psychology (Psy. 210).....		2
Principles of Education (Ed. 100).....	3	
History of Education (Ed. 120).....		3
Lecture and Reading Course (Com. 141).....		1
	—	—
	6	6
Senior Year		
Secondary Education in Commerce (Com. Ed. 600, 601)..	2	3
Business Organization and Management (Com. 110).....	3	
Labor Problems (Com. 213).....		3
Approved Electives	5	4
	—	—
	10	10

The following courses are offered:

600. Secondary Education in Commerce. The principles of education as applied to the teaching of commercial subjects in secondary schools. Aims, materials, and methods as adapted to all of the commercial subjects taught in the high school, including the organization of courses and the various phases of class-room and laboratory instruction. Special emphasis is given the supervision and direction of practical work.

Prerequisites: Commerce 102, 402, 412. Psy. 220. Ed. 100. Required of students preparing to teach commercial branches. Senior year; first semester; 2 credits; 2 recitations; 1 laboratory period.

601. Practice Teaching in Commerce. Required of seniors in Commercial Education.

Prerequisites: Commerce 102, 402, 412. Psy. 220. Ed. 100. Com. Ed. 600. Senior year; second semester; 3 credits; 2 recitations; practice teaching.

602. Practice Teaching in Commerce. Facilities will be afforded students in commercial education to extend the amount of practice teaching required in course 601.

Elective to seniors and graduates in Commercial Education. Time and credit to be arranged.

CHEMICAL ENGINEERING

RALPH KEMPTON STRONG, Professor of Industrial Chemistry

Chemical Engineering has become a necessary science in the economic management of many of the industries of life. The present need in this country to create new industries to supply products of manufacture formerly imported from abroad, has emphasized the demands upon chemistry and chemical engineering.

Equipment. The department is located on the first floor of the Mines Building where facilities are provided for laboratory practice in industrial chemical work. The laboratory is equipped with cold and hot water, gas, steam, compressed air, vacuum pumps, precision balances, scales for heavy weighing, kettles, filters, direct and alternating electric current, drying oven, hot plate, furnace, and a plentiful supply of regulation apparatus and chemicals.

The standard reference works and texts are kept in the laboratory for constant use in connection with the courses, and the best technical publications are regularly received, complete sets of the journals being available.

Special attention is given to the study of industries already established in Oregon, and to those which offer possibilities for future development. Inspection trips are regularly made by the students to local industries.

The course in Chemical Engineering is arranged so that a general knowledge of engineering materials, machinery and principles is acquired along with special training in physical, organic, inorganic, analytical, and industrial chemistry. Graduates obtain positions in chemical works, either in the laboratory or plant, in analytical and consulting laboratories, and in federal, state, and municipal chemical positions.

DEGREE COURSE IN CHEMICAL ENGINEERING

	Semester	
	1st	2nd
Freshman Year		
General Chemistry (Chem. 105).....	5	
College Algebra (Math. 21).....	2	
Trigonometry (Math. 11).....	3	
Mechanical Drawing (C. E. 107).....	3	
English or Modern Language	3	
Drill (Military 1).....	1	
Gymnasium (Phys. Ed. 15).....	$\frac{1}{2}$	
General Chemistry (Chem. 106).....		2
Qualitative Analysis (Chem. 300).....		3
Elementary Analysis (Math. 31).....		5
Descriptive Geometry (M. E. 152).....		3
Forging and Tool Dressing (I. A. 158).....		2
English or Modern Language	3 or 1	
Drill (Military 2).....		1
Gymnasium (Phys. Ed. 16).....		$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

Sophomore Year		
Qualitative Analysis (Chem. 301).....	3	
Quantitative Analysis (Chem. 401).....	2	
Differential Calculus (Math. 51).....	4	
Engineering Physics (Phys. 101).....	4	
Crystallography and Blowpipe Analysis (Min. 111).....	3	
Drill (Military 3).....	1	
Gymnasium (Phys. Ed. 17).....	$\frac{1}{2}$	
Quantitative Analysis (Chem. 401a).....		5
Integral Calculus (Math. 52).....		4
Engineering Physics (Phys. 102).....		4
Determinative Mineralogy (Min. 112).....		3
Drill (Military 4).....		1
Gymnasium (Phys. Ed. 18).....		$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$

	Junior Year	Semester	
		1st	2nd
Organic Chemistry (Chem. 201).....		3	
Engineering Chemistry (Chem. E. 301).....		3	
Statics and Dynamics (M. E. 251).....		5	
General Materials Testing Laboratory (Exp. E. 225).....		3	
Drill (Military 5).....		1	
Military Science (Theo. Inst. 1).....		1	
Organic Chemistry (Chem. 202).....			3
Industrial Inorganic Chemistry (Chem. E. 302).....			5
Strength of Materials (M. E. 252).....			3
Power and Hydraulic Laboratory (Exp. E. 206).....			3
Drill (Military 6).....			1
Military Science (Theo. Inst. 2).....			1
		16	16
Senior Year			
Physical Chemistry (Chem. 410).....		3	
Industrial Organic Chemistry (Chem. E. 401).....		5	
Electrical Machinery (E. E. 403).....		3	
Seminar (Chem. E. 403).....		2	
Electives		3	
Physical Chemistry (Chem. 411).....			3
Electrochemical Industries (Chem. E. 402).....			3
Industrial Chemical Processes (Chem. E. 404).....			2
Seminar (Chem. E. 406).....			2
Electives			6
		16	16
Electives			
Elements of Thermodynamics (M. E. 319).....		3	
Fire Assaying (Min. 401).....		4	
General Geology (Geol. 135).....		2	
Economic Geology (Geol. 182).....		3	
Ceramic Chemistry (Cer. E. 301).....		3	
Business Organization and Management (Com. 110).....		3	
Metallography and Technical Pyrometry (Exp. E. 246)....			3
Principles of Economics (Com. 210).....			3
Textile Chemistry (Chem. 203).....			2
Food Industries (Chem. 416).....			2
Metallurgy of Iron and Steel (Met. 410).....			2
Electrometallurgy (Met. 442).....			2

The following courses are offered:

301. Engineering Chemistry. A course of lectures and laboratory work designed to give students in the different branches of engineering a knowledge of the chemical processes directly related to their line of work. Some of the topics treated are: Fuels, combustion, refractories, lubricants, boiler feed waters, iron, steel, alloys, cements.

The laboratory work will be adapted to the needs of the individual student when desirable.

Prerequisite: General Chemistry, (Chem. 105 and 106, or the equivalent). Course in Chemical Engineering; junior year; first semester; 3 credits; 2 lecture periods and 1 laboratory period of three hours. Elective for all engineering students. Fee \$4.50. Deposit \$2.25. Text: Benson, Industrial Chemistry for Engineering Students (MacMillan).

302. Industrial Inorganic Chemistry. The principal inorganic industries are studied in lectures and in the laboratory from the viewpoint of modern scientific and applied chemistry. The laboratory instruction is such as to develop ability in the student to carry on independent work with confidence. The principles involved in the problems are carefully studied before the laboratory manipulation is attempted. The valuation of the raw materials and products, and the chemical control of the processes, are given special attention. The topics discussed are those related to salts, acids, alkalies, fertilizers, paint pigments, and other inorganic products.

Prerequisites: Quantitative Analysis, (Chem. 401) and Engineering Chemistry, (Chem. E. 301). Course in Chemical Engineering; junior year; second semester; 5 credits; 2 lecture periods and 3 laboratory periods of three hours each. Elective for other students with the necessary preparation. Fee \$7.50. Deposit \$3.75.

401. Industrial Organic Chemistry. A course of lectures and laboratory work covering the chief organic branches of industrial chemistry. Special emphasis is given to the fundamental principles involved in the various processes studied. The topics studied include: mineral, vegetable, and animal oils, soap, glycerine, rubber, leather, explosives, sugars, starches, destructive distillation of coal and wood.

Prerequisites: Quantitative Analysis (Chem. 401), and Organic Chemistry (Chem. 201 and 202). Course in Chemical Engineering;

senior year; first semester; 5 credits; 2 lecture periods and 3 laboratory periods of three hours each. Elective for other students with the necessary preparation. Fee \$7.50. Deposit \$3.75.

402. Electrochemical Industries. The applications of the electric current to the manufacture of chemical materials by electrolytic and electrothermal reactions are studied by means of lectures and laboratory work. The following topics are treated: Sodium hydroxide and chlorine, hypochlorites, chlorates, perchlorates, oxygen, hydrogen, carbide, graphite, carbon disulphide, phosphorus, sodium, magnesium, aluminum.

Prerequisites: Industrial Inorganic Chemistry (Chem. E. 302), and Physical Chemistry (Chem. 410). Course in Chemical Engineering; senior year; second semester; 3 credits; two lecture periods and one laboratory period of three hours. Fee \$4.50. Deposit \$2.25.

403. Seminar. Conferences on recent developments in applied chemistry. Assigned references and reports. Open only to seniors in Chemical Engineering. First semester.

404. Industrial Chemical Processes. Principles of, and current practice in, the standard processes used in industrial chemical operations, in which attention is also given to problems in design of chemical apparatus and plant.

Prerequisites: Industrial Inorganic and Organic Chemistry (Chem. E. 302 and 401). Course in Chemical Engineering; senior year; second semester; 2 credits; two laboratory periods of two hours each. Fee \$2.00.

406. Seminar. Continuation of Chemical Engineering 403. Open only to seniors in Chemical Engineering. Second semester.

ART AND ARCHITECTURE

FARLEY DOTY McLOUTH, Professor
LAWRENCE EUGENE ROBINSON, Assistant Professor
EDNA MAY FLARIDA, Instructor
EDITH FREEMAN SHERMAN, Instructor

The département of art offers no regular courses in art with the idea of instruction in the fine arts in view, but only as art education relates to highest ideals in everyday life, and to meet the requirements of art in the industries. Courses in drawing, composition, light and shade and color are planned and given for the purpose of facilitating instruction in the applied arts courses — design, metal work, clay modeling, and the ceramic art; and in the work of such other departments as Agriculture, Domestic Art, and Industrial Arts.

The art courses offered not only develop utilitarian ideas, but they also cultivate an appreciation and love of the beautiful in nature and art.

Equipment. The department occupies three commodious, well-lighted studios on the fourth floor of Agricultural Hall, two draughting rooms on the second floor of Science Hall, a metal-working laboratory and a clay-modeling and pottery studio in Waldo Hall. The studios have north light, are well heated and ventilated and are equipped with suitable studio furniture and accessories, such as casts, still life prints, potter's wheel, tools, and benches. The department is also well supplied with wall drawings, pictures, and port-folios illustrating the different phases of the work.

The College Library has a well-selected and growing reserve in art and architecture, covering all branches of the subjects.

102. Free-Hand Drawing. This course covers the work in representation; still life in line and dark and light; free-hand perspective of circles and linear perspective; some of the principles of composition and design; Egyptian ornaments; the handling of pencil and charcoal.

The degree courses in Home Economics; freshman year; first semester; 2 credits; 2 studio periods of two hours each, and one recitation. Fee \$0.50.

103. Beginning Composition. The study of design principles applied to concrete problems of dress or home decoration; brush and ink, charcoal, and pencil are used as media. Greek design is studied.

Prerequisite: Drawing 102. The degree courses in Home Economics; freshman year; second semester; 2 credits; 2 studio periods of two hours each and one recitation. Fee \$0.50.

204. The Theory and Harmony of Color. This course covers the study of the so-called primary colors, the development of the prismatic colors with their complements, color quality, color values and the various harmonies. Problems in monochromatic, complementary, analogous, and dominant harmonies are to be rendered. These problems will be an application of harmonious color schemes as applied to articles of household use, dress, and home interiors.

Prerequisites: Art 102, 103. Degree course in Home Economics; sophomore year; first semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

205. Water Color. The courses in water color are offered as elective cultural subjects and are open to any student who has completed courses 102, 103, and 204, or their equivalent. The work of the first semester will include simple flat washes of geometric casts, and flat color washes of still life subjects of broad area.

First semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

206. Water Color. A continuation of course 205, leaving flat washes and taking up more complex still-life studies, posters, and landscapes.

Prerequisite: Art 205. Second semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

305. Advanced Design. An elective offered to give a broader working knowledge of design principles which shall serve as a guide to selection, adaptation, and composition, both structural and decorative, for practical application in interior decoration, costume design, and for articles of personal and household use.

First semester; 2 credits; 3 studio periods of two hours each. **Prerequisites:** Art 102, 103, and 204. Fee \$0.50.

306. Advanced Design. A continuation of course 305.

Prerequisites: Art 102, 103, 204, and 305. Second semester; 2 credits; 3 studio periods of two hours each. Fee \$0.50.

411. Industrial Arts Drawing. Free-hand perspective and working sketches of wood joints, furniture, and machine parts; and drawing from written descriptions.

The degree course in Industrial Arts; freshman year; second semester; 2 credits; 3 studio periods of two hours. Elective;

M. E. Vocational course; first year; second semester; 1 credit; 3 studio periods of one hour each. Fee \$0.50.

412. Industrial Arts Design. A course in the principles of design suited to the Industrial Arts course. Original design plates of door and cabinet paneling, metal parts, hinges, escutcheons, draw pulls, etc., and furniture, will be required.

The degree course in Industrial Arts; sophomore year; first semester; 1 credit; 3 studio periods of one hour. Fee \$0.50.

413. Clay Modeling and Pottery. The study of the modeling and making of pottery occupies most of the time. Different ways of making and decorating vases will be studied, using the hand work and the potter's wheel. Modeling from nature, tile building, mold and cast making in plaster, firing and glazing.

Prerequisites: Art 102 and 103. Elective; the degree courses in Home Economics; senior year; first semester; 2 credits; 3 studio periods of two hours each. Fee \$2.00.

414. Clay Modeling and Pottery. A continuation of course 413 with more advanced work and more time given to clay modeling.

Prerequisites: Art 102, 103, or their equivalents, and 413. Elective; the degree course in Home Economics; senior year; second semester; 2 credits; 3 studio periods of two hours each. Fee \$2.00.

505. Water Color Rendering. The purpose of this course in water color rendering is to give a knowledge of the handling and use of the brush and color in the expression of landscape gardening subjects, detail, and decoration.

Fee \$0.50.

506. Water Color Rendering. A continuation of course 505, followed by full color drawings of landscape gardening subjects. Later in the semester opportunity is given for out-of-door sketching in color.

Elective; degree course in Landscape Gardening; sophomore year; second semester; 2 credits; 2 studio periods of three hours each.

The following courses are open to other students who have completed courses 102 and 103 or their equivalents and to Industrial Arts students having completed courses 411 and 412 or their equivalents. Fee \$0.50.

600. Jewelry Making. The first semester will be given to work in jewelry-making, using copper and silver, and covering the processes of sawing, hard and soft soldering, stone setting, etching, and repousse.

Prerequisites: Art 102, 103, or their equivalent. Elective; the degree course in Home Economics; or any student having the desired prerequisites; 2 credits; 6 studio periods. Fee \$1.00. Deposit \$2.00.

601. Jewelry Making. A continuation of course 600, with the addition of enameling.

Prerequisites: Art 102, 103, and 600. Elective; the degree course in Home Economics; or any student having the desired prerequisites; second semester; 2 credits; 2 studio periods of three hours each. Fee \$1.00. Deposit \$2.00.

602. Art Metal Work. The work of the first semester will cover the processes of piercing, etching, sinking, sawing, riveting, straight bending and repousse, in the making of such articles as desk sets, book ends, trays, ladles, bag tops, plates, hinges, corners, etc.

Industrial Arts students; 2 credits; 3 two-hours periods. Fee \$1.00. Deposit \$2.00.

603. Art Metal Work. The second semester work will be largely the problems of raising, hard and soft soldering, and soft enameling, in the making of pitchers, vases, etc.

Industrial Arts students; 2 credits; 3 two-hours periods. Fee \$1.00. Deposit \$2.00.

RURAL ARCHITECTURE

The courses in architecture are offered first to students in agriculture who may major in rural architecture or elect subjects pertaining to farm structures; to students in industrial arts who take house planning; to students in landscape gardening who take subjects in landscape architecture; to students in home economics who take house construction and decoration, and to all others who are interested in rural and domestic architecture and are prepared to take the subjects.

The work is especially adapted to meet the utilitarian requirements of the other departments of the College and to serve these departments in an able manner. The courses consist of problems in design and construction and a consideration of building materials.

For students of agriculture the course amounts to agricultural engineering. It is important for men who contemplate this work

in agricultural colleges, who intend to develop farm establishments, who favor structural work or who themselves have buildings to erect.

The following courses are offered:

439. Horticultural Products Buildings. A study of structures used in the drying, canning, and evaporation of fruits. The course consists of tours of inspection and drawing plans, elevations, and sections of structures used for by-products of fruits.

Senior year; second semester; 2 credits.

518. Perspective Drawing. A study of mechanical perspective. Elective; sophomore year; second semester; 1 credit; 1 draughting room period. Fee \$0.50. Text: Frederick, Simplified Mechanical Perspective.

533. Agricultural Building Design. This course is for students of agriculture. Design and construction of buildings for the farm are studied. The work is individual; thus each student may elect the particular kind of buildings in which he is especially interested.

Agriculture; elective; first semester; 2 credits; 2 draughting room periods of three hours each. Fee \$0.50. Text: Howe, Agricultural Drafting.

535. Advanced Agricultural Building Design. A continuation of course 533.

Agriculture; elective; second semester; 2 credits; 2 draughting room periods. Fee \$0.50.

536. Farm Plan Drawing. The work of this course is prescribed for students studying farm management. The conventional methods of indicating lines, roads, fields, etc., will be carefully presented.

Agriculture; elective; first semester; 1 credit; 1 draughting room period. Fee \$0.50. Text: Howe, Agricultural Drafting.

537. Farm Structures. Advanced drawing of concrete and frame structures. Details of construction, sanitation, and economic principles as advanced by other departments will receive strict attention. This course is for students who wish to specialize in agricultural engineering or rural architecture.

Prerequisites: Arch. 533 and 535. Agriculture; elective; first semester; 4 credits; 4 draughting room periods. Fee \$1.00.

538. Farm Structures. A continuation of course 537.

Agriculture; elective; second semester; 4 credits; 4 draughting room periods. Fee \$1.00.

601. Elementary Landscape Architectural Drawing. This course takes up lettering and line drawing at the beginning and develops into the study of the presentation of garden plans. The relation of architecture to the garden will be observed in all drawings and various architectural styles will be noted. Only pen and ink drawings will be presented.

Landscape Gardening; freshman year; first semester; 3 credits; 3 draughting room periods. Fee \$0.75.

602. Advanced Landscape Architectural Drawing. A continuation of course 601, in which drawings will be made using water colors.

Landscape Gardening; freshman year; second semester; 3 credits; 3 draughting room periods. Fee \$0.75.

603. Landscape Architectural Design. Problems in the design of gardens and grounds presented not as working drawings but as rendered sketch drawings showing geometry of plan, color scheme and perspective.

Prerequisites: Arch. 601, 602 and 518. Landscape Gardening; junior year; first semester; 3 credits; 3 draughting room periods. Fee \$1.00.

604. Landscape Architectural Design. A continuation of course 603.

Landscape Gardening; junior year; second semester; 3 credits; 3 draughting room periods. Fee \$0.75.

701. Elementary House Planning. This course consists of practical problems in planning and construction. All drawings will be working-drawings presented on detail paper. The work is prescribed for Industrial Arts students.

Industrial Arts; junior year; first semester; 3 credits; 3 draughting room periods. Fee \$0.75.

702. Advanced House Planning. A continuation of course 701.

Industrial Arts; junior year; second semester; 3 credits; 3 draughting room periods. Fee \$0.75.

H. A. 501. House Construction and Decoration. (See page 325, School of Home Economics.)

Fee \$0.50. Text: Robinson, Domestic Architecture.

H. A. 502. Advanced House Construction. A continuation of H. A. 501.

Domestic Art; elective; second semester; 2 credits; 2 draughting room periods of two hours each. Fee \$0.50. Text: Robinson, Domestic Architecture.

CHEMISTRY

JOHN FULTON, Professor
JOHN HICKS, Associate Professor
MARY HARTZELL, Assistant Professor
DONALD TRESSLER, Instructor
EARL GILBERT, Instructor
WILLIAM HODGE, Instructor
ROBERT PRESTON, Instructor
HAROLD KELLY, Instructor

The beginner's courses, Chemistry 100, 101, and 102, consist essentially of the proof of some of the well-known chemical laws, such as the law of conservation of matter, the law of definite proportions and of multiple proportions, the Law of Boyle, and the Law of Charles. The student attains skill in the manipulation of apparatus, and in the management of equipment in general. From this elementary work he proceeds to qualitative analysis, in the study of which he is taught to separate and identify the different elements composing the mass, and, in the case of metals, to learn of their properties, their use, the different methods of obtaining them from their ores, and the combinations in which they occur in nature.

If he has shown suitable proficiency, he advances to quantitative analysis, which is the determination of the amounts of the ingredients. He is taught both methods of analysis, volumetric, or the method by solution, and the gravimetric, or the method by precipitation and weighing. On completing these courses, the student is fairly well prepared to take up advanced chemistry, which treats of the analysis of soils, manures, cattle foods, dairy products, etc., or he can take up the subject from the inorganic side in the analysis of minerals, fuels, oils, gas, etc., or he can view it from the pharmacist's standpoint, in analyzing drugs.

Equipment. The department of Chemistry occupies nearly the whole of Science Hall, except the fourth floor, which is occupied by the department of Pharmacy, and a few rooms on the third floor that are at present used by the department of Rural Architecture. The Chemical department of the Experiment Station has four rooms on the second floor.

The largest room in the building is the main general laboratory, which will accommodate 550 students in four sections. Adjacent to this laboratory is the general stock room, that in itself is a

division of the department. It is well stocked with all the necessary apparatus and chemicals required for all the courses given in the department. One of the greatest improvements in the Chemical department is the new gas machine; this, when working at its full capacity, can supply gas for 800 burners.

The new organic laboratory has been increased in size until it now contains room for 240 students. The equipment is of the best.

The new quantitative analysis room now has accommodations for 96 students in four sections. Its equipment of hot and cold water, gas, pressure pumps, etc., makes it as good as the best.

The qualitative analysis room can accommodate 50 students in three sections. Great pains have been taken to make this room as nearly an actual chemical work room as possible.

In the balance room there are 23 analytical balances.

The main lecture room, which is situated on the third floor, has a seating capacity of 150. It is provided with lecture tables that are supplied with gas, electricity, and water. Adjoining the lecture room is a small preparation room, in which is kept all special apparatus used for lecture demonstration, as well as supplies for the agricultural laboratory. This room is equipped with all the necessary apparatus for the proper elucidation of the principles of this branch of chemistry.

For the work in quantitative analysis (advanced), an entire room is set aside. This room is fitted with gas, water, and electricity; condensers for distilled water; batteries; extraction apparatus for fats; nitrometers; Kjeldahl apparatus; hot-water filtering apparatus; grinders for fodders, steam and air baths, calorimeter, polariscope, Westphal and analytical balances; coarse balance for rough work, hot-plates, and minor apparatus.

COURSE IN AGRICULTURAL CHEMISTRY

For the prescribed group courses for the freshman and sophomore years in the School of Agriculture consult pages 79-80.

101. General Chemistry. Continuation of course 100.

Prerequisite: Chemistry 100 or its equivalent. Freshman year; second semester; 2 credits; 1 recitation or lecture; 2 laboratory periods of 3 hours each. Fee \$3.00. Deposit \$2.00. Text: Smith, General Chemistry for Colleges. Laboratory manual Qualitative Analysis.

108. Advanced Inorganic Chemistry. Some topics considered: the periodic system; theories of valency; X-rays and crystal structure; cooling curves; the thermal equilibrium diagram; inorganic isomerism; the cobaltammines; colloids; etc.

Prerequisite: Chemistry 411 or its equivalent. Elective; first semester; 3 credits; 1 conference or lecture; 2 laboratory periods of three hours each. Fee \$4.00. Deposit \$3.00.

111. General Chemistry. This is a course designed especially for students entering in the second semester. The ground covered is the same as that of 100 and 101, except that it calls for double the credit and requires twice as much of the student's time during the semester.

Freshman year; second semester; 6 credits; 5 recitation and lecture periods; 2 laboratory periods of three hours each. Fee \$6.00. Deposit \$4.00. Text and Laboratory Manual same as for Chemistry 100 and 101.

121. History of Chemistry. Devoted largely to the rise and development of chemical theories and laws.

Prerequisite: Chemistry 11 or its equivalent. Elective; second semester; 2 credits; 2 lectures or recitations. No fee.

510. Plant Chemistry. Designed for students desiring a fuller consideration of the growth and composition of plants; properties, nature, and classification of plant constituents; chemical analysis; chemical synthesis; enzymes; chemistry of the manufacture of plant products, etc.

Prerequisite: Chemistry 501 or its equivalent. Second semester; 2 credits; 2 lectures. Laboratory work to extent of 2 to 3 credits may be taken in connection with the lectures. Text: Haas and Hill, Chemistry of Plant and Plant Products. Assigned reading.

	Semester	
	1st	2nd
Junior Year		
Agricultural Economics (Com. 219).....	3	
Agricultural Chemical Analysis (Chem. 505).....	3	
Organic Synthesis (Chem. 305).....		3
Trigonometry (Math. 11).....	3	
College Algebra (Math. 21).....	2	
Elementary Algebra (Math. 31).....		5
Drill (Military 5, 6).....	1	1
Military Science (Theo. Inst. 1, 2).....	1	1
Electives	4	7
	—	—
	17	17
Senior Year		
National Government (Com. 320).....	3	
State and Municipal Government (Com. 322).....		3
Advanced Agricultural Analysis (Chem. 507, 508).....	4	4
Elementary Physical Chemistry (Chem. 410).....	3	
Thermo and Electro Chemistry (Chem. 411).....		3
Seminar in Chemistry (Chem. 511, 512).....	1	1
Physiological Chemistry (Chem. 409).....		3
Electives	6	3
	—	—
	17	17

Electives may be taken in Chemistry, Physics, Botany, Zoology, Plant Physiology, Animal Physiology, Mathematics, Modern Language, Anatomy, Geology, etc.

Graduate Courses. The following courses may be taken by graduate students as major or minor electives with full credit: Chemistry 104, 302 to 316 inclusive, and 502 to 512 inclusive. The department reserves the right to require additional work in certain cases before credit for these courses be awarded toward an advanced degree.

The following courses are offered:

10. General Chemistry. Fundamental principles of the science; non-metallic elements and their compounds.

Prerequisites: Mathematics A and B. Required of all students who have not had elementary chemistry in high school, except those registered in the degree courses in Pharmacy, Mining, Commerce (Elective), and Landscape Gardening. Freshman year; first semester; 3 credits; 1 lecture; 2 recitations; 2 laboratory periods.

Fee \$3.00. Deposit \$2.00. Text: Smith, General Chemistry for College (Revised.)

11. General Chemistry. Non-metallic and metallic elements and their compounds. Conceptions of chemical equilibrium and the modern theory of solutions frequently applied.

Prerequisite: Chemistry 10 or its equivalent. Freshman year; second semester; 3 credits; 1 lecture; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

12. Elementary Household Chemistry. A course arranged for women who do not care to take the full chemical courses leading to the degree in Home Economics. As its name implies, it is a fragmentary elementary course in the application of chemistry to daily life, rather than an exposition of chemical principles.

It treats of such subjects as the relation of combustion to heat, lights and illuminants; commercial soaps; special soaps and scouring powders; general composition of foods; functions of food; textile fibres; bleaching and bluing, etc.

First semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each. Text: Snell, Elementary Household Chemistry.

13. Elementary Household Chemistry. A continuation of course 12.

Freshman year; second semester; 3 credits; 2 recitations; 2 laboratory periods of 2 hours each. Fee \$3.00. Deposit \$2.00.

Courses 12 and 13 will not be accepted as substitutes for courses 100 and 101.

100. General Chemistry. Fundamental principles; non-metallic elements and their compounds.

Prerequisite: Elementary High School chemistry. Required of all students having had chemistry in the high school (see note below) registered in the degree courses, except Pharmacy, Mining, Commerce (Elective), and Landscape Gardening. Freshman year; first semester; 3 credits; 2 recitations or lectures; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Smith, General Chemistry for Colleges.

101. General Chemistry. Non-metallic and metallic elements and their compounds. Conceptions of chemical equilibrium and the modern theory of solutions are frequently applied.

NOTE — Students who have had one year of chemistry in a standard high school may be permitted to take an examination for credit in Chemistry 10 and 11 provided their high-school credits are not used as entrance units. This examination will be held one week after the opening of the first semester. Laboratory notebooks must be presented.

Prerequisite: Chemistry 100 or its equivalent. Freshman year; second semester; 3 credits; 2 recitations or lectures; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text same as for Chemistry 100.

102. General Chemistry. This course is especially arranged for the students of the School of Home Economics.

Freshman year; first semester; 2 recitations; 2 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

103. General Chemistry. A continuation of course 102.

Freshman year; second semester; 2 recitations; 2 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

104. Chemical Calculations. Calorimetric; specific gravity; gas calculations; calculations of atomic weights and formulas; gravimetric analysis; volumetric analysis.

Prerequisite: Quantitative analysis. Elective; junior or senior year; first or second semester; 2 credits; 2 recitations. (Note: A minimum of 5 students required.) Text: Ashley, Chemical Calculations.

105. General Chemistry for Mining, Chemistry, Chemical Engineering, and Pharmacy students especially, but also open to others who desire to complete General Chemistry, and Qualitative Analysis during the first year.

Freshman year; first semester; 5 credits; 3 recitations; 2 laboratory periods of three hours each. Fee \$5.00. Deposit \$2.00.

106. General Chemistry. A continuation of 105, but with this difference, that Qualitative Analysis succeeds the laboratory manual used in the first semester. This course is open to any one having completed 101, or its equivalent.

The general chemistry text is used as the basis of the recitations in this course which is really descriptive chemistry.

Freshman year; second semester; 5 credits; 2 recitations; 3 laboratory periods of three hours each. Fee \$5.00. Deposit \$2.00. Text: Baskerville and Curtman, Qualitative Analysis.

200. Elementary Organic Chemistry. A study of fundamental principles and more important compounds; petroleum and its products, alcohols, ethers, aldehydes, fatty acids, oils, soaps.

Prerequisite: Chemistry 11 or 101. Course in Home Economics, and Vocational Pharmacy; sophomore year; first semester; 4 credits; 2 recitations; 3 laboratory periods. Fee \$4.00. Deposit \$2.00. Text: Cohen, Organic Chemistry.

200-a. Elementary Organic Chemistry. A course of lectures in Organic Chemistry for those desiring lectures alone and having no time for laboratory work. This course is designed primarily for agricultural students, and should be taken before or with Agricultural Chemistry. It may be taken also by students of other departments who wish to extend their chemical studies in this direction.

Prerequisite: Chemistry 101 or 103. Elective; sophomore year; either semester; 2 credits; 2 lectures.

201. Organic Chemistry. Aliphatic compounds; hydrocarbons, alcohols, ethers, esters, aldehydes, acids, fats, ketones, amines, carbohydrates. Preparation and identification of typical and simple compounds.

Prerequisite: Chemistry 11 or 101. Course in Pharmacy; sophomore year; and Chemical Engineering; junior year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Cohen, Organic Chemistry.

202. Organic Chemistry. Aromatic Compounds; cyclic hydrocarbons, nitro derivatives, amines, diazo compounds, phenols, dyes, proteins, alkaloids.

Prerequisite: Chemistry 201. Course in Pharmacy, sophomore year; and Chemical Engineering, junior year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Cohen, Organic Chemistry.

203. Textile Chemistry. Consists of identification of the different materials used in the textile industries.

Junior year; second semester; 2 credits; 1 lecture; 2 laboratory periods of two hours each. Prerequisite: Chemistry 200. Fee \$2.00. Deposit \$2.00.

300. Qualitative Analysis. This course consists largely of laboratory practice in the ordinary process of separating and identifying ions. It is given in conjunction with 106, and in fact constitutes the laboratory part of the above course.

Freshman year; first semester; 3 credits; 3 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00. Texts: Smith, Chemistry. Baskerville and Curtman, Qualitative Analysis.

301. Qualitative Analysis. A course provided for Mining students who have completed 101, or the equivalent.

Freshman year; first semester; 5 credits; 2 recitations and three laboratory periods of three hours each. Fee \$5.00. Deposit

\$2.00. Texts: Smith, Chemistry. Baskerville and Curtman, Qualitative Analysis.

301-a. Qualitative Analysis. A general course for all students desiring to complete this number during the first semester.

Prerequisite: Course 100. Three credits; 3 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00.

301-b. Qualitative Analysis. A continuation of 301-a consisting of investigation of the properties of the rarer metals.

Prerequisite: Course 100. Three credits; 1 lecture; 2 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00.

302. Qualitative Analysis. Students in Highway Engineering. Three credits; 1 recitation; 3 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

303. Organic Qualitative Analysis. A course for Pharmacy students.

Elective; second semester; 3 credits; 2 recitations; 2 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00.

304. Food and Drug Analysis. This course affords suitable preparation for the students to hold positions in the Federal Food and Drug Laboratories.

The food and drug products on the market that are subject to the greatest adulteration will be analyzed for preservatives and other added materials.

Prerequisites: Organic Chemistry and Botany. Senior year; 3 credits; 3 laboratory periods. Fee \$3.00. Deposit \$2.00.

305. Organic Synthesis. The synthesis of the more complex organic compounds of both the aliphatic and aromatic series, coupled with such reference work as may be to the advantage of the student. The class work in the course will be in the form of a seminar.

Prerequisites: General, qualitative, quantitative, and beginning organic chemistry. Elective for Agricultural Chemistry, Pharmacy, and other students having sufficient training. Senior year; first semester; 3 credits; one seminar and 2 three-hours laboratory periods. Fee \$3.00. Deposit \$2.00.

400. Quantitative Analysis. For Chemical Engineering, Pharmacy, and Mining students, and consisting of the usual work in general quantitative analysis.

Prerequisite: Chem. 105. Sophomore year; first semester; 4 credits; 1 lecture period; 3 laboratory periods of 3 hours each. Fee \$5.00. Deposit \$3.00.

400-a. Quantitative Analysis. For students in Chemical Engineering given at the same time as 400, but more work to the extent of one credit is required of the chemical engineering students.

Prerequisite: Same as for 400. Sophomore year; first semester; 5 credits; 1 lecture; 4 laboratory periods of 3 hours each.

401. Quantitative Analysis. This is a course in analysis for Mining students, and consists of gravimetric analysis of limestones, iron, lead, zinc, arsenic, and antimony ores, coal, and as much other work as time will permit.

The course in Mining Engineering; sophomore year; first semester; 5 credits; 1 recitation; 4 laboratory periods. Fee \$5.00. Deposit \$2.00. Text: Frank and Clemens.

401-a. Quantitative Analysis. A continuation of course 400-a. A course for Chemical Engineers.

Prerequisites: Chem. 400 or 400-a. Sophomore year; second semester; 5 credits; 1 lecture period; 4 laboratory periods of 3 hours each. Fee \$5.00. Deposit \$3.00.

402. Chemistry of Foods. A qualitative and quantitative examination of sugars, fats, proteins, leavening agents. Adulteration of foods, with simple methods of detection; food legislation.

Prerequisite: Chem. 200. Required of all students in Home Economics; sophomore year; second semester; 4 credits; 2 recitations; 3 laboratory periods. Texts: Leach, Food Inspection and Analysis. Olsen, Pure Foods. Sherman, Food Products. Sherman, Organic Analysis. U. S. Bul. 107 (revised). Fee \$4.00. Deposit \$2.00.

403. Chemistry of Water. This course is especially for the students in Highway Engineering, and consists of the examination of waters for potability, and for adaptability for industrial purposes. This course is divided into two parts; first, Sanitary Water Analysis, which investigates the methods of analysis applied to water and sewage, as outlined by the American Public Health Association; second, Chemical Studies of Industrial Waters, which includes the examination of various waters with reference to their adaptability to industrial processes such as heating plants, laundries, paper mills, etc.

Junior year; second semester; 2 credits; 2 laboratory periods. Text: Standard Methods of Water Analysis. A. P. H. A. Fee \$2.00. Deposit \$2.00.

404. Alkaloidal Testing. A study of the alkaloids of the drug plants as regards their structure and synthesis. The means of their identification by the various alkaloidal tests will be studied in the laboratory as well as the means of identifying those organic compounds that enter pharmaceutical preparations. This course will also include the means of detection of the common poisons in the animal body.

Prerequisites: Chemistry 100, 101, 300, and 201. First semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

405. Drug Assaying. The quantitative estimation of the active principles of crude drugs and their preparations, such as solid and fluid extracts, tinctures, pills, etc. The assay of a number of inorganic pharmaceutical preparations will be included in this course.

Methods for the physiological standardization of drugs and drug preparations will be discussed by the instructor.

Prerequisites: Chemistry 100, 101, 300, 201, and 404. Second semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

406. Chemistry of Highway Materials. The course is designed for students in Highway Engineering, and consists of the study of such materials as cement, asphalt, bitumen, mineral oils, tar, and tar products.

The course in Highway Engineering; junior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

407. Applied Electro-Chemistry. Applications of the electric current to analytical operations; electroplating; electrolytic oxidation and reduction; storage batteries; the electric furnace, etc.

Prerequisites: Chemistry 401 or its equivalent and Chemistry 410 and 411 or their equivalent. Chemical Engineering; senior year; first semester; 3 credits; 1 conference; 6 to 8 hours a week in laboratory. Fee \$3.00. Deposit \$2.00. Text: Thompson, Applied Electro-Chemistry. Laboratory Outline of Electro-Analysis.

408. Chemistry for Engineers. This course is particularly for students in Mechanical and Electrical Engineering. It consists of the analysis of coal, oil, gas, and of their calorific powers; also the technical analysis of flue gases.

Elective; junior or senior year; second semester; 2 credits; 2 laboratory periods. Fee \$2.00. Deposit \$2.00.

409. Physiological Chemistry. Chemical study of the fats, carbohydrates, and proteins; discussion of enzyme action, digestion, absorption, and excretion; analysis of blood, gastric juice, and both normal and pathological urine; and demonstrations and assigned reading.

Prerequisites: General and organic chemistry. Pharmacy, Household Science, and Agricultural Chemistry; senior year; second semester; 3 credits; 2 lectures and 2 two-hours laboratory periods. Fee \$2.00. Deposit \$2.00.

410. Elementary Physical Chemistry. Molecular weight determinations; properties of liquids; dilute solutions; solubilities; conductivity of solutions; chemical equilibrium; velocity of reactions.

Prerequisites: Mathematics 31 and Chemistry 401 or their equivalents. Chemical Engineering and Agricultural Chemistry; junior or senior year; 3 credits; 2 lectures and recitations; 1 laboratory period of 4 hours. Fee \$3.00. Deposit \$2.00. Text: Senter, Outlines of Physical Chemistry. Findlay, Practical Physical Chemistry.

411. Principles of Thermo-Chemistry and Electro-Chemistry. Thermochemical measurements; relation of chemical affinity to heat of reaction; conductivity of solutions; electromotive force.

Prerequisite: Chemistry 410. Chemical Engineering and Agricultural Chemistry; junior or senior year; second semester; 3 credits; 1 conference; 6 to 8 hours a week in laboratory. Fee \$3.00. Deposit \$2.00. Texts: Otswold-Luther, Physico-Chemical Messungen. Findlay, Practical Physical Chemistry. Thomsen, Thermochemistry. Leblanc, Electro-chemistry. Senter, Outlines of Physical Chemistry.

412. Metallurgical Analysis. This consists of the analysis of Metallurgical and Engineering materials, such as limestone, cement, coal, iron ore, copper matte, brass, bronze, steel, babbitt metal, water, oil, etc.

The course in Chemical and Mining Engineering; sophomore year; second semester; 3 credits; 3 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: Sidener, Quantitative Metallurgical Analysis.

413. Chemical Technology. A course of lectures in the principles of Organic, Analytical, and Technical Chemistry as applied

to those industries depending upon chemistry as a basis for their processes.

The course in Chemical Engineering; senior year; first semester; 2 credits. A continuous course; credit will not be awarded until the second semester's work has been completed.

414. Chemical Technology. A continuation of course 413.

The course in Chemical Engineering; senior year; second semester; 2 credits. Text: Thorpe, Industrial Chemistry.

415. Methods of Teaching Chemistry. A course designed for those who expect to teach chemistry in secondary schools. Lectures, reports, discussions. A critical study will be made of laboratory, experiments, equipment, sources of materials, modern textbooks, and manuals.

Prerequisites: Chem. 100, 101, 200, and 402.

416. Food Industries. A critical study of cereals, breakfast foods, beverages, animal foods, milk products, spices and condiments. Illustrated with lantern slides.

Prerequisite: Chemistry 402. Elective; junior or senior year; second semester; 2 credits; 2 recitations. Fee \$2.00. Deposit \$2.00. Text: Vulte and Vanderbilt. Food Industries.

417. Methods in Gas Analysis. Required of all Mining students.

Prerequisite: Chem. 401. Sophomore year; second semester; 1 credit; 1 laboratory period of three hours. Fee \$1.00. Deposit \$2.00.

418. Elementary Glass Blowing and Repairing. A course in the elements of the art of welding, cutting, and grinding glass. For upper classmen only, especially for those who expect to become instructors in science in high schools.

Junior or senior year; 1 credit; 1 laboratory period of three hours. Fee \$2.00. Each person procuring his own glass and files. Text: Woollatt, Laboratory Arts, or Frary, Glass Blowing.

500. Agricultural Chemistry. A general course consisting of lectures, recitations, and laboratory work, dealing with the more important phases of Chemistry in its relation to Agriculture.

Prerequisite: Chemistry 101. The course in Agriculture; sophomore year; first semester; 3 credits; 2 recitations. Fee \$3.00. Deposit \$2.00. Text: Tartar and Dutcher, Lecture Notes on Chemistry in its Relation to Agriculture.

501. Agricultural Chemistry. A continuation of course 500.

The course in Agriculture; sophomore year; second semester; 3 credits; 2 recitations; 2 laboratory periods of two hours each. Fee \$3.00. Deposit \$2.00.

502. Dairy Chemistry. A course consisting of lectures, recitations, and laboratory work dealing with the chemistry of milk, milk powders, condensed milk, butter, oleomargarine, cheese, and other dairy products.

Prerequisites: Chemistry 500 and 501. Required of students majoring in Dairy Manufacturing; junior year; second semester; 3 credits; 3 laboratory periods of three hours each. Fee \$3.00. Deposit \$2.00. Text: Bulletin 107, U. S. Bureau of Chemistry. Lincoln and Walton, Quantitative Chemical Analysis. Assigned reading.

503. Soil Chemistry. This is a lecture and laboratory course dealing with the constitution and properties of the chemical constituents of soils; the methods of qualitative and quantitative chemical soil analysis; the chemical changes taking place in soils; the soil solution; and chemical soil deficiencies.

Prerequisite: Chemistry 501. Junior year; first semester; 2 to 4 credits; 2 to 4 laboratory periods of three hours each. Fee \$1.00 per credit. Deposit \$2.00.

504. Soil Chemistry. A continuation of course 503.

Junior year; second semester; 2 to 4 credits; 2 to 4 laboratory periods of three hours each. Fee \$1.00 per credit. Deposit \$2.00.

505. Agricultural Analysis. A course in analytical methods applied to agricultural materials, including cereals, fertilizers, soil, water, vinegar, insecticides, fruit juices, feeding stuffs, etc.

Prerequisites: Chemistry 500 and 501. First semester; 2 to 4 credits; 2 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

506. Agricultural Analysis. A continuation of course 505.

Second semester; 2 to 4 credits; 2 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

507. Advanced Agricultural Analysis. This course is special work in the Experiment Station laboratory, or work of the same general description.

Senior year; first semester; 3 to 4 credits; 3 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

508. Advanced Agricultural Analysis. A continuation of course 507.

Senior year; second semester; 3 to 4 credits; 3 to 4 laboratory periods. Fee \$1.00 per credit. Deposit \$2.00.

509. Animal Chemistry. A study of the composition of the animal body and products of the animal body, such as milk, wool, etc. Special emphasis is placed on the chemistry of the fats, proteins, and carbohydrates. Enzyme action, digestion of foodstuffs their absorption and distribution, fate of the foodstuffs in metabolism, metabolic products and their excretion, will be considered. Recent publications bearing on animal nutrition will be read and discussed.

Prerequisite: Chem. 501 or its equivalent. Junior year; first semester; 2 credits; 2 lectures. Fee \$2.00. Deposit \$2.00.

510. Plant Chemistry. Designed for students desiring a fuller consideration of the growth and composition of plants; properties, nature, and classification of plant constituents; chemical analysis; chemical synthesis; enzymes; chemistry of the manufacture of plant products, etc.

Prerequisite: Chemistry 501 or its equivalent. Second semester; 2 credits; 2 lectures. Text: Haas and Hill, Chemistry of Plant and Plant Products. Assigned reading.

511. Seminar. The work will consist of reports and reviews of articles appearing in scientific journals, and experiment station literature. These papers will be prepared under the supervision of the department, although considerable latitude will be allowed in the selection of subjects and manner of presentation. Required of all senior students majoring in Agricultural Chemistry.

Junior or senior year; first semester; 1 credit.

512. Seminar. A continuation of course 511.

Second semester; 1 credit.

Before taking up the subject of chemistry, students are advised to review thoroughly the elementary principles of physics, especially those related to the mechanics of gases, liquids, and solids with reference to their densities, specific gravities, solubilities, rates of diffusion, etc. Excellent summations are given in Black and Davis' Practical Physics, of which a two-weeks review is given

before entering upon any of the elementary courses in Chemistry. This review will consist of lectures and demonstrations, and assignments of problems.

A. Elementary Chemistry. Fundamental laws of chemistry; general properties of matter; non-metallic elements and their compounds; special attention to oxidation and reduction.

Vocational students in Mechanic Arts; second year; first semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00. Text: McPherson and Henderson, Elementary Chemistry.

B. Elementary Chemistry. Metals; their compounds; alloys; special attention to chemical behavior of metals under shop conditions.

Prerequisite: Chemistry A. Vocational Students in Mechanic Arts; second year; second semester; 3 credits; 2 recitations; 2 laboratory periods. Fee \$3.00. Deposit \$2.00.

ENGLISH LANGUAGE AND LITERATURE

FREDERICK BERCHTOLD, Professor
IDA BURNETT CALLAHAN, Associate Professor
SIGURD HARLAN PETERSON, Assistant Professor
LOREN BURTON BALDWIN, Assistant Professor
GERTRUDE EWING McELFRESH, Instructor
GRACE ROSAAEN-SIEFERT, Instructor
CHARLES JARVIS McINTOSH, Instructor

It is the aim of this department to teach the student to express with clearness what he thinks with vigor. He is taught that the essential part of any composition, whether oral or written, is thought, well organized and well expressed; that to comprehend clearly and to feel strongly what he has to say are the indispensable conditions of making others comprehend and feel it.

What his textbook helps him to do consciously, familiarity with superior writers should help him to do unconsciously; for we may get good from a master of English by unconscious absorption, just as we acquire good manners by associating with gentlemen and ladies. No mind can fail to be stimulated by contact with greater minds, whether living or dead. Their pages feed the powers of thought and strengthen the power of expression, thus enabling the student to think, talk, and write to more purpose.

In all the collegiate courses in English the work is correlated with that offered in the other departments, to bring it into harmony with the trend or spirit of the institution, which is distinctly technical and industrial in character. Subjects are assigned for presentation and discussion which bear close relation to the work pursued by the students in the different schools, in anticipation of their probable needs and activities in later life. What is sought and insisted on is earnest, logical, forceful presentation of facts that will compel attention and carry conviction.

The Oregon Agricultural College participates in a number of intercollegiate oratorical contests and debates; and the department offers elective courses in public speaking, designed to give preparation for these contests.

The following courses are offered:

31. **College Rhetoric.** A rapid survey comprehending the work done by the high school in literature, rhetoric, and composition, and involving the preparation of several short essays, with a view to ascertaining the extent of the student's literary appreciation and

command of rhetorical principles. Lectures, assignments, and recitations upon the methods of effective discourse. Studies in the expository and argumentative methods of writing, with analysis of specimens. The paragraph considered as a distinct stage in expository composition; practice writing to exemplify the various methods of developing the topic statement. Plotting of simple briefs, and writing of easy forensics. At every stage of study selections from standard and contemporary authors will be read and discussed, in order that the student may acquire ability to master content, differentiate literary types, and appreciate standards of excellence. Subjects of composition will be those suggested by the student's personal, school, literary, community, and vocational interests. Oral composition supplementing written.

Compositions required: five expository and three argumentative short themes; one expository theme requiring research and accompanied by outline and bibliography; one resume and one criticism; one argumentative long theme, accompanied by brief. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that the student writes in other departments.

Prerequisite: Three years of English in an accredited high school. The course in Home Economics; freshman year; first semester; 3 credits; 3 recitations. Text: Greenough and Hersey, English Composition.

32. Advanced College Rhetoric. Study of the elements and principles involved in effective discourse, continued. Lectures on the characteristics of the literature of feeling, with rendering of selections for illustration. Discussion of the narrative and descriptive methods of writing. Expository and emotional description differentiated. Examination of the narrative principle in epic forms, in ballad literature, and in the incidents occurring in the drama, in the news letter, and in anecdote. Studies and practice writing in the narrative paragraph and in dialogue. Analysis of two or three of the briefer and less complex short stories of standard authors, for the purpose of gaining an appreciation of the form and function of the short-story type.

Written composition, confined, for the most part, to the descriptive and narrative types of discourse, will be similar in character to that of the first semester. Frequent oral delivery.

Prerequisite: Eng. 31. Course in Home Economics; freshman year; second semester; 3 credits; 3 recitations. Text: Boynton, *Principles of Composition*.

41. Advanced English Composition. The object of this course is to develop facility, clarity, and vigor of expression, and to increase the student's knowledge of the technique of certain types of prose discourse. The course contemplates a somewhat intensive study of the popular essay, the biography, and the criticism, as special forms of exposition, and a consideration of the short-story as a special form of narration. Exercises in analysis and in the application of the mechanics of the expository outline will be required. The written work will consist both of long and of short themes, designed to test the student's ability for organizing subject-matter and giving it effective expression.

Prerequisites: English 31, 32 or 81, 82 or 91, 92 or 85, 86. Elective for juniors and seniors; first semester; 3 credits; 3 recitations. The course will be repeated in the second semester, provided there be a sufficient demand for it. Textbook: Gardiner, *The Forms of Prose Literature*. Collateral Readings.

51. The English Essay and Novel. Study of structure of novel and essay. Study of essay and novel as expressions of national life and thought. Emphasizing the growth of the economic, critical, historical, and personal essay, and the larger categories of fiction: the novel of manners, of character, the problem novel, and the romantic novel. Class and individual assignments, lectures, and reports.

Prerequisites: Eng. 31, 32. The course in Home Economics; sophomore year; first semester; 3 credits; 3 recitations. Text: Fulton, *Essays for Use in College Courses*.

52. The English Drama. Study of the structure and technique of the drama as a distinct literary type. A survey of the rise and development of the tragedy, the comedy, and the historical play. Study of setting, plot, and character as they are employed in the drama. Reading of plays in class; collateral readings; reports on assigned topics.

Prerequisite: Eng. 31, 32. The courses in Home Economics; sophomore year; second semester; 3 credits; 3 recitations. Text: Woodbridge, *The Drama: Its Laws and Technique*.

61. The History of English Literature. A general outline course of the history of English literature. This includes a survey of the principal forms of literature as exemplified by the masters

in each field. The aim is to cultivate an appreciation of what is excellent in quality and form. Masterpieces representing the best thought and form are studied in class or assigned to students for careful reading and reports. Field of study: English literature from its beginning to the end of the eighteenth century.

Elective in all courses; first semester; 3 credits; 3 recitations. Text: Robert Huntington Fletcher, *A History of English Literature*.

62. The History of English Literature. A continuation of course 61. A study of the master minds of the nineteenth century. Lectures, readings, and discussions; critical reports on assigned topics required from all the students.

Elective in all courses; second semester; 3 credits; 3 recitations. Text: Crawshaw, *The Making of English Literature*.

71. American Literature. A study of the growth and development of literature in our country. Particular emphasis is placed on the study of writers of the nineteenth century, including such authors as Irving, Cooper, Bryant, Poe, Hawthorne, Longfellow, Holmes, and Lowell, as well as to prominent writers of the present day. Lectures; class study; class reading; reports on assigned topics; essays.

Elective in all courses; senior year; first semester; 3 credits; 3 recitations. Text: Wendell and Greenough, *History of Literature in America*.

72. American Literature. A continuation of course 71. The metropolitan writers; literature in the South; literature in the West; present schools and tendencies; periodical literature. Lectures; class-room work; reports; essays.

Elective in all courses; senior year; second semester; 3 credits; 3 recitations. Text: Wendell and Greenough, *History of Literature in America*.

81. Modern English Prose. A study of representative modern prose writers, with special reference to prose as found in such present-day standard periodicals as *The Literary Digest*, *The Independent*, and *The Outlook*. Study of the newspaper paragraph. Practice in reporting lectures. Exercises in the elaboration of field notes. Drills looking to the popularization of technical matters and the results of experiments. Drafting of resolutions; writing of syllabuses; reduction of the article to a single short paragraph and to a single sentence; analytical outlines of expository articles; finding in a controversial article the proposition upheld and its sup-

porting points; interpretation of advertisements. Writing of papers and reports. Theme writing. Oral composition.

Prerequisite: Completion of a four-years high school course. The courses in Agriculture, Mechanical Engineering, Highway Engineering, Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy. Freshman year; first semester; 3 credits; 3 recitations. Texts: Lomer and Ashmun, *The Study and Practice of Writing English*. *The Independent*; *The Outlook*; *The Literary Digest*. Woolley, *Handbook of Composition*.

82. Modern English Prose. A continuation of course 81.

The courses in Agriculture, Forestry, Logging Engineering, Mechanical Engineering, Highway and Irrigation Engineering, Commerce, Industrial Arts, and Pharmacy.

Prerequisite: English 81. Freshman year; second semester; 3 credits; 3 recitations.

85. Modern English Prose. A course designed for students in Forestry and Logging Engineering. It includes composition and letter writing, practice in reporting lectures, exercises in the elaboration of field notes, drills looking to the popularization of technical matters, practice in oral delivery and in parliamentary procedure, and exercises in elementary Business English, with particular application to Forestry and Logging Engineering.

Freshman year; first semester; 2 credits; 1 recitation; 1 laboratory period. Text: Lomer and Ashmun, *The Study and Practice of Writing English*. Collateral reading: *American Forestry*.

86. Modern English Prose. A continuation of course 85.

Prerequisite: Eng. 85. Freshman year; second semester; 2 credits; 1 recitation; 1 laboratory period. Text: Lomer and Ashmun, *The Study and Practice of Writing English*. Collateral reading: *American Forestry*.

91. Modern English Prose. The framework of this course is the same as that employed in English 81. In its details, however, constant reference is had to the particular needs of the student in Mining Engineering.

The course in Mining Engineering; freshman year; first semester; 2 credits; 2 recitations. Text: Lomer and Ashmun, *The Study and Practice of Writing English*. Supplement: *The Electrical and Mining Engineering Journal*.

92. Modern English Prose. A continuation of course 91.

Prerequisite: Eng. 91. The course in Mining Engineering; freshman year; second semester; 1 credit; 1 recitation.

101. Special Composition. If a student, in his work in any department, submits papers notably deficient in English, either his Dean or his major professor will require him to take course 101. It consists wholly of theme work and consultations, and is continued in each case as long as the needs of the student require. This course carries no credits.

All courses; first and second semesters; 2 recitations.

103. Composition of Addresses. This course deals with the composition of the most important kinds of addresses, including the argument, the eulogy, the commemorative address, and various forms of non-forensics. The work consists of lectures, a study of textbooks, analysis of masterpieces, practice in the composition of the various forms, and frequent class-room exercises.

Elective in all courses; junior year; first semester; 2 credits; 2 recitations. Text: Baker, Forms of Public Address.

104. Extempore Speaking. Practice in the presentation of the various forms of addresses. Speeches are prepared on topics of special interest to the students and delivered with the view to making them most effective as means in the advancement of a particular cause. Extensive criticism is offered as to methods of selection, organization, and presentation.

Elective in all the courses; junior year; second semester; 3 credits; 3 recitations. Text: Baker, Forms of Public Address.

105. Practical Public Speaking. Practice in the presentation of the various forms of public addresses, voice training, study of gesture, bearing, and the elements of ease, grace, and force in presentation. Practice in the rapid preparation and in the impromptu delivery of speeches on topics of current interest. Designed for those who wish some general training in public speaking. Drill in parliamentary procedure.

Prerequisite: 104. Elective; first semester; 3 credits; 3 recitations. Text: Robinson, Effective Public Speaking.

106. Practical Public Speaking. Continuation of course 105.

Prerequisite: Eng. 105. Elective; second semester; 3 credits; 3 recitations. Text: Robinson, Effective Public Speaking.

107. Argumentation. Practical work in brief-drawing, the collection and handling of evidence, and debating. Each student will prepare several debates under the direction of the instructor, construct briefs, and participate in class room debates. Personal

consultation with the instructor on thought, composition, and delivery. This course is a critical and practical study of argumentation. The class is limited in number, and the course can be taken only with the consent of the instructor.

Elective; second semester; 2 credits; 2 recitations. Text: Foster, *Argumentation and Debate*.

108. Oratory. This course is intended as special preparation for those who wish to enter oratorical work. The work consists of lectures on the theory of oratory, the preparation of original orations, class-room exercises, and personal conferences and criticism. The course can be taken only with the consent of the instructor.

Elective; first semester; 1 credit; 1 recitation. Text: Shurter, *The Rhetoric of Oratory*.

141. Technical English. The writing which the engineer has to do is almost wholly of the nature of exposition. Indeed, it is only in so far as it is expository that it offers any problems different from those which arise in general composition. In technical English, then, in the engineering courses, attention is centered on exposition of the various types which the engineer has to use,—description, narration, directions, criticism, and argumentation.

At all times it will be insisted on that whatever facts the student expresses, shall be expressed accurately; that the treatment of the subject shall be complete for the purpose in hand; that the form of presentation shall be logical; and that the expression shall be economical for the reader.

Prerequisite: 6 credits of college English. The courses in Engineering, Soils, and Farm Management; elective in all other courses; junior or senior year; second semester; 2 credits; 2 recitations. Text: Earle, *Theory and Practice of Technical English*.

142. Technical Business English. The preparation of the manuscript and copy for the printer. The study of and extensive practice in proof-reading. The study of the advertising circular, students being required to plan and complete circulars for various advertising purposes. Practice of writing informal trade agreements, specifications, and other business forms.

Prerequisite: Eng. 143 or its equivalent. The course in Commerce; freshman year; second semester; 3 credits; 3 recitations.

143. Advanced Commercial Correspondence. Review of the essentials of correct and effective English: clearness, interest,

proper punctuation, grammatical correctness, effective diction. The business letter in detail, special attention being given to letters of application, letters of inquiry and information, circular letters, letters of complaint, sales letters, follow-up letters, and collection letters. Study of postal regulations.

The course in Commerce; freshman year; first semester; 3 credits; 3 recitations. Text: Lewis, Business English.

191. Story-Telling. The study of children's literature, and the analysis and reproduction of short stories suitable for the primary grades, the kindergarten, and the nursery.

Elective in the course in Home Economics; senior year; first semester; 1 credit; 1 recitation.

192. Story-Telling. A continuation of course 191.

Elective in the course in Home Economics; senior year; second semester; 1 credit; 1 recitation.

206. Expression. Literary interpretation, including analysis, memorizing, and rendering of selected masterpieces of prose and poetry. The aim of this course is to enable the student not only to understand and appreciate the thought and spirit of literature, but to render it naturally and effectively, to correct erroneous habits of speech, to give freedom, purity, and strength of tone, to cultivate the power of expression through imagination, and to eliminate artificiality, affectation, and self-consciousness.

Elective; first semester; 2 credits; 2 recitations.

207. Expression. Continuation of course 206.

Elective; second semester; 2 credits; 2 recitations.

208. Dramatic Interpretation. Advanced literary interpretation. Training in delivery of masterpieces of prose and poetry. Interpretative study of Shakespeare and the modern drama; presentation of scenes from plays; bodily expression; impersonation.

Prerequisites: Course 206 and 207. Elective; first semester; 2 credits; 2 recitations.

209. Dramatic Interpretation. Continuation of course 208.

Elective; second semester; 2 credits; 2 recitations.

301. Elementary News-Writing. Instruction and training in judging news values, gathering and writing news, and newspaper correspondence. Writing news technical to Agriculture, Home Economics, Engineering, Commerce, Forestry, etc. Open to

students of junior rank and others especially recommended by the professor of English. Required as a condition of eligibility for leading positions on student publication staffs.

Elective in all courses; junior year; both semesters; 2 credits; lecture and laboratory period.

302. Advanced News-Writing. A continuation of course 301, dealing with special technical and feature writing, reporting, copy reading, editorial writing, proof-reading, make-up, and head-writing, with field work in writing specials to various publications.

Prerequisite: English 301 or its equivalent. Elective in all courses; junior or senior year; both semesters; one credit; one lecture.

315. Seminar. Study and review of the recognized masterpieces of European Continental literature in approved translations.

Elective in all courses; first semester; 2 credits; 2 recitations.

316. Seminar. A continuation of course 315.

Elective in all courses; second semester; 2 credits, 2 recitations.

E. Junior Secondary English. The object of offering this course is to afford students not having completed the English work of the third year of the secondary school an opportunity to take that work.

The course contemplates, in part, a survey of English literature, during the first and second semesters. A study is made of the characteristics of literary epochs, attention being especially directed to the shaping influence of contemporary civil events. Study of a typical masterpiece belonging to each epoch. Assigned readings, followed by oral and written reports.

The work in Rhetoric and Composition involves intensive study and practice in the four forms of discourse already studied in the first two years of the secondary school, the aim of such intensive study and practice being the establishment of the student in good usage.

No textbook is prescribed for Rhetoric and Composition; the principles of Rhetoric will be evolved from the written work prepared and presented by members of the class. The subjects of compositions, whether written or oral, will be chosen, as a rule, from the epochs surveyed, the writers studied, and the books read. Those planning to pursue the course are requested to secure, in order to have at hand a convenient reference, Brooks' two-books course in English Composition, used in the high schools of Oregon.

Prerequisite: Course J or its equivalent. The vocational course; first semester; 3 credits; 3 recitations. **Text:** Long, English Literature.

F. Junior Secondary English. Continuation of E. The work in written Composition requires several Expository and several Argumentative themes of such length and of such literary quality as shall thoroughly test the student's ability for sustained, consistent thinking, clear expression, and a just literary appreciation. Oral composition supplementing written, will be a feature of each week's class work. A student's standing in written composition will be determined, in part, by the form and rhetorical effectiveness of the class themes and examination papers that he writes in other departments.

Prerequisite: Eng. E. or its equivalent. The vocational course; second semester; 3 credits; 3 recitations. Courses in Home Economics and Industrial Arts; freshman year; first semester; 3 credits; 3 recitations. **Text:** Canby and others, Composition in Theory and Practice.

G. Vocational English. Review of English Grammar. The purpose of the work in English Grammar, as prescribed in Course G and in subsequent vocational English courses, is such an intensive study of, and persistent drill in, the fundamentals of the subject as shall establish the student in relatively correct usage. The accomplishment of this end is sought by giving the work with such frequency and by such concrete methods as shall tend to create in the student a liking for the subject of English Grammar. Identification and analysis of sentences. Punctuation. Written and oral exercises in spelling. The specific aim of written composition is the development of the sentence sense, the avoidance of the common grammatical errors in expression, and the production of a legible manuscript. Use is made of the letter as a medium for the solution of simple but actual business problems. Written reproduction of short articles. Short narrative themes. Oral composition comprehending the reproduction of articles, the explanation of processes and mechanisms, and the narration of incidents.

The course in written and oral expression is supplemented by a course of reading designed to enable the student, by helping him to acquire a command of language, the more effectively to discharge the duties of his vocation, to create pleasure for himself in

reading good books, and to develop the practice of reading into a habit for life.

The vocational course; first year; first semester; 3 credits; 3 recitations. Text: Baskervill and Sewell, English Grammar. Books for reading: Fowler, Starting in Life; Choosing a Career. Richardson, The Girl Who Earns Her Own Living.

H. Vocational English. Special attention is given, in the study of Grammar, to the identification of the parts of speech, the classification and uses of clauses, and the conjugation of the verb. Punctuation, with drill primarily on the uses of the comma. The logical arrangement of thoughts as represented in the outline will be discussed and illustrated. In written composition, the content and mechanics of the letter are given particular consideration. Exposition of concrete objects. Narrative writing. Oral composition will treat current events and subjects listed for written composition.

Prerequisite: Eng. G. Vocational course; first year; second semester; 3 credits; 3 recitations. Text: Huntington, Elements of English Composition. Periodical: Current Events. Books for reading: Hale, What Career? Rollins, What Can a Young Man Do? Alden, Women's Ways of Earning Money.

I. Advanced Vocational English. Study of the structure and functions of phrases; the correction of the common errors in etymology and syntax. Punctuation. Writing reports on newspaper and magazine articles; writing advertisements; drafting simple specifications. Oral composition comprehending current events, sales talks, and informal debates.

Prerequisite: Eng. I. Vocational course; second year; first semester; 3 credits 3 recitations. Text: Webster, English for Secondary Schools. Periodicals: Popular Science Monthly, Boy's Magazine, Popular Mechanics, World Magazines. (The student will subscribe for at least one periodical in the foregoing list.) Books for reading: Shaw, The Outlook for the Average Man. Reid, Careers for the Coming Men. Abbot, Women and Industry.

J. Advanced Vocational English. Modifications of the verb; drill on the sequence of tenses; practice in the detection and the correction of the more elusive forms of false syntax. Review of punctuation. The aim of the work in written composition is to improve diction, increase vocabulary, and develop greater variety,

force, and directness of expression. Reports on articles in books, magazines, and newspapers. Reports on actual business experiences. Letter writing. Oral composition involving conversations on problems in business and actual life.

Prerequisite: Eng. I. Vocational course; second year; second semester; 3 credits; 3 recitations. Text: Gardiner, Kittredge and Arnold, Manual of Composition and Rhetoric. Books for reading: Kaulfman, The Efficient Age. MacLean, Wage Earning Women.

M. Elementary Business English. Besides giving a thorough training in the various forms of commercial correspondence, the course aims to ground the student in the vocabulary, forms, and usages peculiar to business and administrative pursuits. There is constant and persistent practice in spelling and punctuation, in composition and letter writing, with a view to imparting to the student's English strength and virility, and to enable him to achieve results.

Two-years Business course; second year; first semester; 3 credits; 3 recitations.

N. Elementary Business English. A continuation of course M. Advanced composition and letter writing; business forms, incidental writing; summaries; advertising; preparation of copy and proof-reading. Good, clear, effective English is at all times insisted upon.

Prerequisite: Eng. M. Two-years Business course; second year; second semester; 3 credits; 3 recitations. Text: Lewis, Business English.

HISTORY

JOHN B. HORNER, Professor

The study of history is fundamental to leadership, there being no line of human investigation that does not depend upon historic knowledge. History is required in Commerce and is offered as an elective in all other schools of the Oregon Agricultural College.

The instruction is largely given by lectures illustrated with lantern views. In the more advanced classes, each student is required to prepare at least one lecture. Although textbooks are required, the work in the various courses in history is done in connection with the college library, which is accessible to students on all week days.

The courses given at present are as follows:

30. European History. Course 30 includes the study of Europe at the time of Louis XIV; reconstruction of Europe at Utrecht; Russia and Prussia become European powers; Wars of Frederick the Great; Struggle between France and England for India; Rivalry of France and England in North America; The Old Regime in Europe; The Spirit of Reform; Enlightened Despots of the Eighteenth Century; The French Revolution; The First French Republic; Europe and Napoleon; The Reconstruction of Europe at the Congress of Vienna.

Elective; first semester; 3 credits; 3 recitations. Text: Robinson and Beard, *The Development of Modern Europe*, Vol. I.

40. Modern Europe. This course comprises a study of the following subjects: Europe after the Congress of Vienna; The Industrial Revolution; Revolution of 1848; Unification of Italy; Formation of the German Empire and the Austro-Hungarian Union; The German Empire; France under the Third Republic; Social and Political Reforms in England; British Empire in the Nineteenth Century; Russian Empire in the Nineteenth Century; Turkey and the Eastern Question; The Expansion of Europe in the Nineteenth Century; Some of the great problems of today.

The course in Commerce; sophomore year; second semester; 3 credits; 3 recitations. Text: Hazen, *Europe Since 1815*.

52. History of the British Empire. A coherent view of the larger factors influencing national development from the earliest times to the British Empire of today. Social, economic, artistic,

and intellectual growth is broadly surveyed, and is made to reveal a picture of the changing conditions of the people rather than that of the king and nobility. Legal and constitutional development is also emphasized by tracing the origin and development of English common law and by discussing the nature and importance of the great statutes. Particular attention is given to such subjects as the Industrial Revolution, Growth of the Power of the House of Commons, the Extension of the Franchise, Remedial Legislation, and Colonial and Imperial Development.

Elective; senior year; first semester; 3 credits; 3 recitations. Text: Green, History of England and Greater Britain.

62. Contemporary American History. The history of the United States from the Discovery of America to the present time. Collateral with the textbooks such matters as the negro question, the industrial revolution, capitalism and socialism, free silver, direct government, woman suffrage, the growth of judicial review, the new nationalism, imperialism, the labor movement, the progressive movement, the Panama-Colombia question, present status of the Monroe Doctrine, and our relation with the Latin-American republics, are discussed from the standpoint of history.

Prerequisite: History D or its equivalent. The course in Commerce; freshman year; second semester; 3 credits; 3 recitations. Text: Bassett, History of the United States.

70. History of Oregon. Five epochs of Oregon history. Early explorations. Fur trading and colonization. Provisional government. Territorial government. State government. Indian Folk-Lore. History of Oregon Literature. Course 70 is given in lectures.

The course in Commerce; sophomore year; first semester; elective second semester; 3 credits; 3 lectures.

80. American Diplomatic History. This course deals with the history of the chief events in American foreign affairs from the beginning of the government to the present time. Its purpose is to show the policies of our government on the same subject at different times, the causes for the changed policies, and the methods employed to work out the policies. An attempt is made to show the changed attitude of governments in their dealings with each other in the course of our national history. Throughout the course considerable attention will be given to character studies of the men leading in our diplomatic work. The ultimate aim is the application of our experience to present problems.

Elective; senior year; second semester; 3 credits; 3 recitations.

100. American Biography. A study in the public careers of typical American statesmen and other men of affairs. It is intended to cover the entire field of American history. The object is to emphasize the personal element in our national development and to become more familiar with the leaders of our economic progress. Students desiring to place especial stress upon any feature of the study may elect not to exceed 20 percent of their allotment of biographical research. (Lectures, assigned reading, and discussion.)

Elective; junior or senior year; first semester; 3 credits; 3 recitations.

110. History of South America. This course includes the history of South America, Central America, and Mexico; hence comprises the discovery, colonization and growth of Latin America. Although the dramatic story of our southern neighbors reads like a romance, the course is designed primarily to meet the requirements of Americans who desire to cultivate deeper interest in our sister republics through a broader knowledge of their political and economic development.

Elective; 3 credits; 3 recitations.

D. United States History. With special attention to the colonial, political, and industrial aspects. A brief course that covers the leading events of our history. Particularly important in Oregon since the introduction of direct legislation and equal suffrage.

Two-years Business course; first year; second semester; 3 credits; 3 recitations. Text: Channing.

LIBRARY

IDA ANGELINE KIDDER, Librarian
LUCY MAY LEWIS, Assistant Librarian
LILLIAN MABEL GEORGE, In charge Continuations Dept.
BERTHA HERSE, In charge Circulation Dept.
LILA GRACE DOBELL, Assistant
BLANCHE MARIE CLAUSMEYER, Assistant
ETHEL ALLEN, Assistant

Equipment. The Library occupies the second floor of the Administration building and one room on the first floor. The reading and general reference room is large, well lighted, and extends entirely across the building. It is supplied with about six hundred leading magazines and newspapers. Through the courtesy of the editors, a large number of farm, orchard, stock, and home journals, and country newspapers of Oregon are received regularly at the reading room. The book stacks, occupying adjacent rooms, contain 34,000 volumes of standard work of history, biography, engineering, agriculture, natural science, general literature and reference, and about 3000 reports and other publications from the Agricultural Colleges and Experiment Stations of all the states, with 50,000 bulletins and pamphlets. The library is a designated depository of United States Government publications, of which it has about 7,000 volumes. Over 2,000 of these were received as a gift from the library of the late United States Senator Dolph.

Practical use of the books has led to the establishment of small laboratory collections kept in the rooms of the following departments: General Chemistry, Agricultural Chemistry, Animal Husbandry, Agronomy, Horticulture, Botany, Forestry, Bacteriology, Zoology, Pharmacy, Commerce, and Civil, Mechanical, Electrical, and Mining Engineering. Each department library is in charge of the head of that department, to whom application must be made for the use of the books.

All books are classified and catalogued according to the Dewey decimal system. Books may be drawn for home use by all officers and students of the College. Books may be kept by the students for two weeks with the privilege of a renewal, and by officers for any reasonable time. All students have free access to the shelves of the library.

The reference library in the reading room consists of encyclopedias, dictionaries, standard reference books in the different departments of study, together with books designated by professors

for collateral reading in the various courses of instruction. A small collection of books for cultural reading is also kept in the reading room. In the same room, and accessible to all readers, is the card catalogue of the general library, including the books of the department libraries. The catalogue includes both authors and subjects under one alphabet on the dictionary plan; there is also a card catalogue of the publications of the U. S. Department of Agriculture, and a card index to the publications of the State Experiment Stations.

1. Library Practice. This course teaches, by means of lectures and practical problems, the use of catalogues, indexes, and reference books, such as dictionaries, encyclopedias, atlases, handbooks of general information, handbooks of history, statistics, quotations, etc.

All degree courses; freshman year; one semester; $\frac{1}{2}$ credit; 1 lecture; 1 recitation; 1 laboratory period each alternate week.

MATHEMATICS

CHARLES LESLIE JOHNSON, Professor
EDWARD BENJAMIN BEATY, Associate Professor
NICHOLAS TARTAR, Assistant Professor
HARRY LYNDEN BEARD, Instructor
FREDERICK CHARLES KENT Instructor

The following courses are offered:

8. Commercial Mathematics. An advanced course in commercial arithmetic, especially for students in the School of Commerce. To do successful work in this course, the student should have a thorough knowledge of all the fundamental operations of arithmetic, including the various phases of percentage and interest. Emphasis is laid on computations of the more difficult problems connected with partnership and corporation settlements, balance sheets and statements, equation of accounts, partial payments, savings bank accounts, compound interest, stocks and bonds, life insurance, and annuities, partly for the information obtained in the various subjects and partly for the drill afforded in the use of figures. Daily drills are given in short methods and rapid calculation.

The course in Commerce; freshman year; first semester; 3 credits; 3 recitations. Text: Van Tuyl, Complete Business Arithmetic.

11. Plane Trigonometry. This course includes functions of acute angles, right angles, functions of any angle, relations between functions, inverse functions, trigonometric equations, and oblique triangles. Considerable time is devoted to the deduction of trigonometric formulae, study of trigonometric identities, and the solution of practical problems.

All Engineering courses; freshman year; first three-fifths first semester; 3 credits; 5 recitations. Text: Wentworth and Smith, Plane Trigonometry.

12. Plane Trigonometry. The course in Industrial Arts, second semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Trigonometry.

14. Trigonometry. A review of algebra, including logarithms, is followed by a course similar in character to 11, except that more time is given to the solution of practical problems.

The course in Forestry; freshman year; first semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Trigonometry.

15. Spherical Trigonometry. The courses in Highway and Irrigation Engineering; freshman year; first semester; one credit; one recitation. Text: Wentworth and Smith, Spherical Trigonometry.

21. College Algebra. After a brief review of radical expressions, theory of indices, and quadratic equations, graphical representation and mathematical induction are studied.

All engineering courses; freshman year; last two-fifths of either semester; 2 credits; 5 recitations. Text: Hawkes, Advanced Algebra.

22. Algebra. A course for freshmen in Engineering who show by poor work in courses 11 or 21 that they need further preparation in algebra before continuing their mathematics.

All Engineering courses; freshman year; second semester; 5 credits; 5 recitations. Text: Hawkes, Luby, and Touton, Second Course in Algebra.

25. Practical Agricultural Mathematics. A course on the essentials of Advanced Arithmetic and Trigonometry. The Arithmetic includes a thorough drill in both common and decimal fractions; proportion; percentage, embracing interest, partial payments, discount, etc.; mensuration, including problems necessary for an agriculturist. The Trigonometry includes use and application of logarithms, the solving of problems in both right and oblique triangles, finding angles, distances, areas, etc.

The course in Agriculture; freshman year; either semester; 3 credits; 3 recitations.

31. Elementary Analysis. Under College Algebra are treated the binominal theorem, progressions, complex numbers, and the theory of equations. In analytical geometry the point, straight line, circle, conic sections, and some of the higher plane curves are studied. Considerable time is given to the plotting of curves in both rectangular and polar coordinates.

Prerequisites: Trigonometry and College Algebra. All Engineering courses; freshman year; either semester; 5 credits; 5 recitations.

34. Elementary Analysis. This course is similar to 31, but shorter. Particular emphasis is given to curve plotting in both rectangular and polar coordinates.

Prerequisite: Trigonometry. The course in Forestry; freshman year; second semester; 3 credits; 4 recitations. Text: Granville and Smith, Elementary Analysis.

41. Plane Analytic Geometry. Course 41 is offered to students who enter the sophomore year deficient in Analytic Geometry. The topics studied are the point, the straight line, polar coordinates, transformation of coordinates, the circle, conic sections, tangents, diameter, poles and polars, discussions of general equations of the second degree, problems in loci, and higher plane curves.

All Engineering courses; sophomore year; first semester; 3 credits; 3 recitations.

51. Differential Calculus. Among the subjects presented are: differentiation and applications, evaluation of indeterminate forms, expansion of functions, Taylor's and Maclaurin's theorems, maxima and minima, points of inflection, curvature, change of independent variable, functions of two or more variables, asymptotes, curve tracing, etc.

All Engineering courses; sophomore year. Elective for juniors and seniors in other courses; either semester; 4 credits; 5 recitations. Text: Granville, Differential and Integral Calculus.

52. Integral Calculus. Among the topics considered are: direct integration, definite integrals and applications; integration by parts, integration of trigonometric forms, etc.; applications to finding of lengths and areas of curves, surfaces, and volumes of solids of revolution, etc.; double and triple integration and applications. In this course, as in course 51, great stress is laid upon practical applications, and a large number of practical problems are solved.

All Engineering courses; sophomore year. Elective for juniors and seniors in other courses; second semester; 4 credits; 5 recitations. Text: Granville, Differential and Integral Calculus.

61. Differential Equations. A study of the solution of ordinary and partial differential equations which the Engineering student is likely to encounter.

Prerequisites: Courses 51, 52. Elective; junior year; first semester; 3 credits; 3 recitations. Text: Campbell, Differential Equations.

71. Method of Least Squares.

Prerequisites: Courses 51, 52. Elective; junior year; second semester; 2 credits; 2 recitations. Text: Merriman, Method of Least Squares.

81. Hyperbolic Functions.

Prerequisites: Courses 51, 52. Elective; junior or senior years; second semester; 2 credits; 2 recitations. Text: McMahon, Hyperbolic Functions.

91. Mathematical Theory of Investment. This course treats of the theory of long-time investments, and includes the most important applications of mathematics to financial problems.

It will be thoroughly practical in its treatment, and while arranged to meet the needs of students in Commerce, is open to juniors and seniors of all courses.

Elective; junior and senior years of all courses; either semester; 3 credits; 3 recitations.

A. Algebra. The work of the course includes a drill in the fundamental operations, use of parentheses, special rules of multiplication and division, factoring, highest common factor, lowest common multiple, and fractions.

The Mechanic Arts course; first year; either semester; 5 credits; 5 recitations. Text: Hawkes, Luby, and Touton, First Course in Algebra.

B. Algebra. The topics studied are solution of fractional and literal equations, problems involving linear equations, simultaneous linear equations, involving two or more unknown numbers, problems involving simultaneous linear equations, graphical representation, inequalities, involution, evolution, theory of exponents, radical expression, and imaginary numbers.

The Mechanic Arts course; first year; either semester; 5 credits; 5 recitations. Text: Hawkes, Luby, and Touton, First Course in Algebra.

C. Algebra. Required of freshmen in Engineering who enter with but one year of Algebra.

Either semester; 3 credits; 3 recitations. Text: Hawkes, Luby, and Touton, First Course in Algebra.

D. Plane Geometry. Course D includes the first two books of Plane Geometry. The constant aim is to develop in the student

the power of logical reasoning, and of clearness and accuracy of expression. To this end, many original exercises are studied, and at all times demonstrations and proofs are freely discussed in the class room. Required of freshmen entering deficient in first semester of Plane Geometry.

Either semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Geometry.

E. Plane and Solid Geometry. A continuation of course D, arranged for freshmen in Engineering who enter deficient in the second semester of Plane Geometry.

Second semester; 5 credits; 5 recitations. Text: Wentworth and Smith, Plane and Solid Geometry.

F. Solid Geometry. Required of all Engineering freshmen who are deficient in Solid Geometry.

Freshman year; first semester; 2 credits; 3 recitations. Text: Wentworth and Smith, Solid Geometry.

G. Plane Geometry. Courses G and H are arranged for freshmen who enter deficient in the second semester of Plane Geometry, and who desire to use both semesters to make up the condition. The two courses are equivalent to course K.

Freshman year; first semester; $1\frac{1}{2}$ credits; 2 recitations. Text: Wentworth and Smith, Plane Geometry.

H. Plane Geometry. A continuation of course G.

Freshman year; second semester; $1\frac{1}{2}$ credits; 2 recitations. Text: Wentworth and Smith, Plane Geometry.

K. Plane Geometry. A continuation of course D, covering the last three books of Plane Geometry. Many original exercises are studied. Required of freshmen, except those in Engineering, who enter deficient in second semester of Plane Geometry.

Either semester; 3 credits; 4 recitations. Text: Wentworth and Smith, Plane Geometry.

L. Plane Geometry. A course arranged to meet the needs of students in Mechanic Arts.

The course in Mechanic Arts; second year; second semester; 4 credits; 5 recitations. Text: Wentworth and Smith, Plane Geometry.

M. Commercial Arithmetic. A review of all the essential operations. Special stress is laid on short methods; daily drills in

rapid calculation; computation of estimates; partnership settlements, etc.

The two-years Business course; first year; first semester; 3 credits; 5 recitations. Text: Van Tuyl, Essentials of Business Arithmetic.

N. Commercial Arithmetic. A continuation of course M.

The two-years Business course; first year; second semester; 3 credits; 5 recitations; Text: Van Tuyl, Essentials of Business Arithmetic.

O. Shop Arithmetic. A thorough drill in the principles of arithmetic, with special application to shop problems of all sorts.

The course in Mechanic Arts; second year; first semester; 4 credits; 5 recitations. Text: Bolton, Shop Mathematics.

R. Farm Arithmetic. An elective course for students in the vocational course in Agriculture who feel the need of a review of arithmetic. A practical text dealing with problems of the farm will be used.

The vocational course in Agriculture; second semester; 3 credits; 3 recitations. Text: Burkett and Swartzel, Farm Arithmetic.

T. Geometry and Trigonometry.

The course in Mechanic Arts; third year; first semester; 4 credits; 5 recitations.

MILITARY SCIENCE AND TACTICS

THOMAS FRANCIS MAGINNIS, Captain, U. S. Army, Retired, Commandant, Professor of Military Science and Tactics.

*DENIS HAYES, Captain, Adjutant General's Department, National Army.

*CYRUS FRANKLIN DUGGER, First Lieutenant, Adjutant General's Department, National Army.

The General Government founded Agricultural and Mechanical Colleges to meet the conditions of both peace and war. The education of the citizen, indeed, to be complete, requires him to be trained for both peace and war. In putting this into practice the General Government has acted on the theory that a college training is a military asset, that college men are training themselves for leadership, and that the training at Agricultural and Mechanical Colleges coordinates closely with military training. The cadet is taught that military training is both mental and physical. That mental military training is: first, to determine the objective; second, to analyze, organize, and systematize action by putting in practice the Five General Tactical Principles that state what lines of action must be followed in gaining any objective, either in peace or war; third, to study and think out the methods — technical or otherwise — that best put into practice the lines of action laid down in the Five General Principles. The mental habits thus formed are as necessary in peace as in war and in this way military training coordinates with and is helpful to the training in other courses. Discipline is based on control; control is based on training; training is based on team work. The cadet is taught that acts of authority as well as acts of obedience are acts to promote team work. This impersonal teaching is of utmost value to the cadet, teaching him that authority has no arrogance and that obedience is not servility. The greater part of the cadets' life will be passed in obeying, or commanding, so this training is for every-day use. The cadet is taught that a poor physical appearance comes from, or is caused by, a poorly or improperly developed physique. Military service has always required a good all-round physique and so from the first military training has been designed to develop and better the physical condition.

The objective of the military course is to train the cadet to be able to perform the duties of an officer in enlisting, feeding, equipping, caring for, drilling, and training a company. His ability as a tactical instructor is the most important factor.

The College, conforming to the spirit of law, has provided an efficient system of military instruction for training cadets to become officers. The Congressional Land Grant Act of 1862 requiring military instruction, was passed during a critical period in the life of the Nation while it was engaged in a civil war. The best of evidence was then at hand showing the need of trained officers for citizen soldiers. The object of the law, therefore, was to provide well-trained officers for citizen soldiers.

The military body of this College consists of one regiment of infantry, a hospital corps, signal corps detachment, and a band of fifty instruments. The drill training and administration are about the same as for officers in the Regular Army.

Instruction in the course is prescribed for all undergraduate male students. The instruction is both practical and theoretical.

Reserve Officers' Training Corps. General Order 49, War Department, 1916, providing for the establishment of the Reserve Officers' Training Corps, has been in operation at the Oregon Agricultural College since the beginning of the year 1917.

The object of the R. O. T. C. is to qualify students, by systematic and standard training methods, to be commissioned in the Officers' Reserve Corps so that in time of national emergency, trained men, graduates of the College, may lead units of the large armies on which the safety of the country will depend.

All physically fit male students, citizens of the United States, on entering the College, unless excused for proper cause by the College authorities, are members of the Reserve Officers' Training Corps. The first two years of military training in this or an equivalent institution constitute the Basic Course. Such men as show a proper interest and aptitude during membership in the Basic Course are permitted to enter the Advanced Course. The Advanced Course consists of the third and fourth years of military training at this or an equivalent college.

A yearly allowance of \$14.00, in the nature of commutation of uniform, is made to each member of the basic and advanced courses. In addition the Government makes an allowance of 30 cents a day, as commutation of subsistence to each member of the advanced course. This allowance is paid quarterly and covers the two years at College during membership in the advanced course, and in addition the vacation, except during time spent at camp, coming between the third and fourth years.

The student is not required by reason of membership in the Reserve Officers' Training Corps to enter into any agreement to continue in College a definite length of time. He has the same liberty to leave College as though he were not a member. In order to be eligible to membership in the advanced course, however, he must agree to attend two summer training camps for a period of four weeks each providing he remains in College. These camps, in the regular order, will come at the end of his third and fourth years of military training. He may, however, under certain regulations, substitute camps at the end of his first or second year for the required camps in the advanced course. No regulation will require him to do this. It is an arrangement which may be made for his convenience or advantage.

The summer training camps are organized by bringing together the students from the different colleges which maintain units of the R. O. T. C. These camps will be most interesting and instructive. The Government makes an additional allowance for clothing to men who attend. It also furnishes them transportation to and from the camp of instruction, or mileage therefor at the rate of 3½ cents per mile. Excellent food is provided. Moral conditions are carefully controlled by the regular army officers in charge. In short, the camps together with the other military instruction the student gets, not only offer every opportunity for his physical and mental development, but offer it at no expense to him. During the past year, indeed, the War Department has paid out through the Commandant's office, to members of the Reserve Officers' Training Corps at Oregon Agricultural College, something over \$17,500.00, a very substantial help to the men who are attending the Institution.

The Oregon Agricultural College is classified by the War Department as a "distinguished college." This honor was first won by the Cadet Regiment during the 1916-17 school year, and the men of the Regiment intend that it shall not be lost. Interest in military work is constantly increasing and the zeal and spirit of the students is most satisfactory to the College authorities.

The new armory contains a drill room 120x300 feet in extent, ample office room, and suitable rooms for storage of guns and other ordnance.

Eight hundred and forty U. S. magazine rifles, with equipment and ammunition, are furnished by the U. S. Government. Other necessary accoutrements and apparatus for the thorough equip-

ment of the military department are furnished by the College, or the U. S. Government.

Appointment and promotion of officers and non-commissioned officers, and their relative rank in each grade, are determined according to the military standing of the cadets, based upon a careful consideration of the following points: knowledge of drill and other duties, practical application of this knowledge on the drill field, and recommendations of superior officers; zeal, soldierly bearing, and aptitude for command; character; military record; general standing in College.

Commissioned officers are selected from the senior class or from such students as have had three or more years of drill; Sergeants from seniors or juniors, or cadets having two or more years drill; Corporals from juniors or sophomores, or cadets having had one or more years drill. All appointments and promotions of commissioned officers are made by the Commandant, with the approval of the President of the College.

Work in military drill is required of all male students of the institution, including all regular degree students, and all vocational, special, and optional students, except short course Forestry students, four periods a week throughout their undergraduate course. Senior privates may, however, upon petition approved by the President of the College, be excused.

One credit a semester is allowed for military drill, and grades are reported at the end of each semester the same as in any other subject.

Students physically unable to participate in the regular military drill may be assigned by the Commandant to light duty in the department.

Persons transferring to the Oregon Agricultural College with advanced credits from other educational institutions of equal rank will not be exempt from the military requirements, but will be required to offer an equivalent of credits for the back military credits represented or accumulated.

Persons presenting credentials for military work taken at other educational institutions, or for service in the U. S. Army, may be given credit for such work in so far as it is deemed equivalent to the requirements of this institution.

If for any reason a student is relieved from the military requirements, except as specified above, other credits must be substituted therefor.

Paragraph 24, General Orders No. 70, War Department, November 18, 1913, directs that, "Upon occasions of Military Ceremony, in the execution of drills, guard duty, and when students are receiving any other practical military instruction, they shall appear in the uniform prescribed by the institution. They shall be held strictly accountable for the arms and accoutrements issued to them."

The Commandant has general charge of all matters pertaining to the uniform. The cost of the complete uniform during the past year was \$25.50. The uniform consists of cap, coat, breeches, leggins, and shoes, of material of the same quality as that used by the U. S. Army. It is not advisable for men to purchase any of these articles before entering the College, as only articles of regulation texture and uniformity of style and color are permitted. They can all be supplied at the College cheaper than they can be bought at retail prices by the individual outside.

The student must come prepared to deposit the price of the uniform. Upon the completion of each semester of the college year he will have refunded to him \$7 in cash, which is one-half of the government allowance for the year.

Proficiency in the Military department is a requisite to graduation.

The drill hours during the days Monday to Friday are the same for all members of the Reserve Officers' Training Corps. One credit for each semester's drill is given. Two additional credits per semester may be secured for Military Drill Saturday mornings. This Saturday morning drill is optional with the student. Members of the faculty are cooperating with the Military department and are giving, on Saturday mornings, courses in various essentially military subjects as follows: Camp Sanitation, Gas Engines, Mining and Explosives, Military Engineering, Military Practice, Landscape Sketching, Mapping, Hippology, and Camp Cookery, which are also optional with the student, and for which appropriate credits are given. These courses have proved very popular with the students and are of decided military value. Many other subjects are listed in the regular College schedule which are of prime military value. Shops and laboratories are well equipped and the College is offering every opportunity to men who may wish to make a special study to equip themselves for military service.

During the year 1917-18 the drill period was increased by the College authorities beyond the demands of the War Department. The fact that 97 percent of the members of the cadet regiment

signified their desire, at the end of the year for the continuance of the increased period is an indication of the general demand by the student body for the work and of the spirit with which these men are fitting themselves for service to the country.

Military Drill 1. Freshman year; first semester; 1 credit.

Military Drill 2. Freshman year; second semester; 1 credit.

Military Drill 3. Sophomore year; first semester; 1 credit.

Military Drill 4. Sophomore year; second semester; 1 credit.

Military Drill 5. Junior year; first semester; 1 credit.

Military Drill 6. Junior year; second semester; 1 credit.

Military Drill 7. Senior year; first semester; 1 credit.

Military Drill 8. Senior year; second semester; 1 credit.

Military Drill 9. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. First semester; 1 credit.

Military Drill 10. This is for students who may elect to drill and who are not required to drill by existing regulations. It is also for those students who may have received any credits in Military Drill 1 to 8, inclusive, who are still required to drill or who may elect to drill. Second semester; 1 credit.

Military Drill A. First semester; first year; Vocational course; 1 credit.

Military Drill B. Second semester; first year; Vocational course; 1 credit.

Military Drill C. First semester; second year; Vocational course; 1 credit.

Military Drill D. Second semester; second year; Vocational course; 1 credit.

Military Drill E. First semester; third year; Vocational course; 1 credit.

Military Drill F. Second semester; third year; Vocational course; 1 credit.

Special and optional students will be given credits in military drill as indicated above for undergraduate students. For their first semester's drill work they will be given credits in Military Drill 1. For their second semester's drill work they will be given credit in Military Drill 2. In the following years they will be given credits correspondingly.

THEORETICAL INSTRUCTION

Military Science 1. Junior year; first semester; 1 credit; 1 hour a week, lecture or quiz and tactical problem.

Military Science 2. Junior year; second semester; 1 credit; 1 hour a week, lecture or quiz and tactical problem.

Military Science 3. Senior year; first semester; 1 credit; 1 hour a week on duties pertaining to their office or on tactical problem work.

Military Science 4. Senior year; second semester; 1 credit; 1 hour a week on duties pertaining to their office or on tactical problem work.

The course of training given bellow is the minimum course for all cadets of the Oregon Agricultural College, except those specializing in some military study or those not physically qualified. It is the Reserve Officers' Training Course.

COURSE OF TRAINING FOR THE INFANTRY UNITS

Basic Course—

Advanced Course—

Freshmen.....	1 and 2	Juniors.....	5 and 6
Sophomores.....	3 and 4	Seniors.....	7 and 8

1. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

Physical drill (Manual of Physical Training—Koehler); Infantry drill (U. S. Infantry Drill Regulations), to include the School of the Soldier, Squad and Company, Close and Extended order. Preliminary instruction sighting position and aiming drills, gallery practice, nomenclature and care of rifle and equipment.

(b) Theoretical. Weight 4.

Theory of target practice, individual and collective (use of landscape targets made up by U. S. Military Disciplinary Barracks, Fort Leavenworth, Kans.); military organization (Tables of Organization); map reading; service of security; personal hygiene.

2. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

Physical drill (Manual of Physical Training—Koehler); Infantry drill (U. S. Infantry Drill Regulations), to

include School of Battalion, special attention devoted to fire direction and control; ceremonies; manuals (Part V, Infantry Drill Regulations); bayonet combat; intrenchments (584-595, Infantry Drill Regulations); first-aid instruction; range and gallery practice.

(b) Theoretical. Weight 4.

Lectures, general military policy as shown by military history of United States and military obligations of citizenship; service of information; combat (to be illustrated by small tactical exercises); United States Infantry Drill Regulations, to include School of Company; camp sanitation for small commands.

3. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

The same as course 2 (a). Combat firing, if practicable, but collective firing should be attempted in indoor ranges by devices now in vogue at United States Disciplinary Barracks.

(b) Theoretical. Weight 4.

United States Infantry Drill Regulations, to include School of Battalion and Combat (350-622); Small-Arms Firing Regulations; lectures as in (b) course 2; map reading; camp sanitation and camping expedients.

4. Military art.

Three hours a week (counting 14 units).

(a) Practical. Weight 10.

The same as course 2 (a); signaling; semaphore and flag; first-aid. Work with sand table by constructing to scale intrenchments, field works, obstacles, bridges, etc. Comparison of ground forms (constructed to scale) with terrain as represented on map; range practice.

(b) Theoretical. Weight 4.

Lectures, military history (recent); service of information and security (illustrated by small tactical problems in patrolling, advance guards, rear guards, flank guards, trench and mine warfare, orders, messages, and camping expedients); marches and camps (Field Service Regulations and Infantry Drill Regulations).

5. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Duties consistent with rank as cadet officers or non-commissioned officers in connection with the practical work and exercises laid down for the unit or units. Military sketching.

(b) Theoretical. Weight 11.

Minor tactics; field orders (studies in minor tactics, United States School of the Line); map maneuvers. Weight 8.
Company administration, general principles (papers and returns). Weight 1.

Military history. Weight 2.

6. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Same as (a) course 5. Military sketching.

(b) Theoretical. Weight 11.

Minor tactics (continued); map maneuvers. Weight 8.
Elements of international law. Weight 2.

Property accountability; method of obtaining supplies and equipment (Army Regulations). Weight 1.

7. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Duties consistent with rank as cadet officers or non-commissioned officers in connection with the practical work and exercises scheduled for the unit or units. Military sketching.

(b) Theoretical. Weight 11.

Tactical problems, small forces, all arms combined; map maneuvers; court-martial proceedings (Manual for Courts-martial).

International relations of America from discovery to present day; gradual growth of principles of international law embodied in American diplomacy, legislation, and treaties.

Lectures: Psychology of war and kindred subjects.

General principles of strategy only, planned to show the intimate relationship between the statesman and the soldier (not to exceed 5 lectures.).

8. Military art.

Five hours a week (counting 24 units).

(a) Practical. Weight 13.

Same as course 7 (a).

(b) Theoretical. Weight 11.

Tactical problems (continued); map maneuvers. Rifle in war.

Lectures on military history and policy.

It is presumed that each member of the Reserve Officers' Training Corps during his academic course has taken one course or equivalent credit in either French, or German, or Spanish.

Special courses can no doubt be arranged at each institution so that specialists will be developed for duties other than those prescribed for reserve officers of the mobile arms.

MODERN LANGUAGES

LOUIS BACH, Professor

MELISSA MARGARET MARTIN, Instructor

The department of Modern Languages is prepared to offer courses of three years in French, German, and Spanish.

In harmony with all other courses of the College, the final aim of the instruction is practical use for the various spheres of activity and pursuits of life. While the disciplinary and cultural values of language study are duly recognized and emphasized, the predominant purpose, all the time and everywhere, is the development of personal power for social service.

The method of teaching suits the end in view. It is independent, to a great extent, of the textbooks used, much time being spent on oral drill, and each new point of theory being illustrated by copious examples and conversational exercises. Ear, eye, and tongue are equally trained. The study of grammar, at the same time, is made to serve as a course in applied logic. Learning all about subject, predicate, and object, together with their various modifiers, rendering a clear account of the relations that words bear to one another, when put together in sentences, the student necessarily brings order into his reasoning power, substituting definite, fundamental conceptions for vague and hazy fancies. Furthermore, by constantly comparing new words and modes of expression with similar ones in his own language, by applying familiar grammatical principles to a new field of effort, by abundant translating from one idiom into the other, the student is sure to gain a deeper and more comprehensive understanding of modern English than could be obtained in any other way. Appreciation comes through comparison.

A certain amount of specified work in a language is definitely required by some departments. In other departments, German, French, or Spanish may be taken as electives, and when so taken, the student receives full credit for one year's work.

Students who have had two years of high-school German, French, or Spanish, are ready to enter the corresponding second year class in College, one year's work in College being equivalent to two years in the high school. With one year's work in the high school, the student is entitled to enter the second semester of the first year class.

All the courses offered may be taken up at the beginning of either semester.

FRENCH

101. Elementary French. Grammar, oral and written exercises; reading of easy prose.

First semester; 3 credits; 3 recitations.

102. Elementary French. A continuation of course 101.

Prerequisites: Mod. Lang. 101 or one year of high-school French. Second semester; 3 credits; 3 recitations.

103. Intermediate French. Advanced grammar, composition, reading of narrative, description and scientific prose; conversational exercise on all sorts of topics.

Prerequisites: Mod. Lang. 101 and 102, or two years high-school French.

104. Intermediate French. Continued; the same plan of work as course 103.

Prerequisites: Mod. Lang. 101, 102, 103. Second semester; 3 credits; 3 recitations.

107. Advanced French. Selections from the various classes of literature specially suited to the particular needs of the class. Composition and conversational exercises based on the texts in use.

Prerequisites: Mod. Lang. 101, 102, 103, 104. First semester; 3 credits; 3 recitations.

108. Advanced French. Continued on the same plan as course 107.

Prerequisites: Mod. Lang. 101, 102, 103, 104, 107. Second semester; 3 credits; 3 recitations.

GERMAN

201. Elementary German. Grammar, oral and written exercises, reading of easy prose.

First semester; 3 credits; 3 recitations.

202. Elementary German. A continuation of course 201.

Prerequisite: Mod. Lang. 201 or one year high-school German. Second semester; 3 credits; 3 recitations.

203. Intermediate German. Advanced grammar, composition, reading of narrative, descriptive and scientific prose; conversational exercises on all sorts of topics.

Prerequisite: Mod. Lang. 201, 202, or two years high-school German. First semester; 3 credits; 3 recitations.

204. Intermediate German. A continuation of course 203.

Prerequisites: Mod. Lang. 201, 202, 203. Second semester; 3 credits; 3 recitations.

207. Advanced German. Reading of texts from the various classes of literature, composition and conversational exercises on the texts used.

Prerequisites: Mod. Lang. 201, 202, 203, 204. First semester; 3 credits; 3 recitations.

208. Advanced German. A continuation of course 207.

Prerequisites: Mod. Lang. 201, 202, 203, 204, 207. Second semester; 3 credits; 3 recitations.

SPANISH

301. Elementary Spanish. Grammar, oral and written exercises, reading of easy prose.

First semester; 3 credits; 3 recitations.

302. Elementary Spanish. A continuation of course 301.

Prerequisite: Mod. Lang. 301 or one year high-school Spanish. Second semester; 3 credits; 3 recitations.

303. Intermediate Spanish. Advanced grammar; composition; reading of narrative and descriptive texts; conversational exercises on all sorts of topics.

Prerequisites: Mod. Lang. 301, 302, or two years high-school Spanish. First semester; 3 credits; 3 recitations.

304. Intermediate Spanish. A continuation of course 303.

Prerequisites: Mod. Lang. 301, 302, 303. Second semester; 3 credits; 3 recitations.

307. Advanced Spanish. Reading of texts from various classes of literature; composition and conversational exercises based on the texts in use.

Prerequisites: Mod. Lang. 301, 302, 303, 304. First semester; 3 credits; 3 recitations.

308. Advanced Spanish. A continuation of course 307.

Prerequisites: Mod. Lang. 301, 302, 303, 304, 307. Second semester; 3 credits; 3 recitations.

PHYSICAL EDUCATION FOR MEN

ALFRED DAVID BROWNE, Director
JOSEPH AMOS PIPAL, Professor of Intercollegiate Athletics
HOVEY CLYDE McDONALD, Instructor
FRED STUTZ, Assistant

Because physical health determines capacity for efficiently carrying out the work which a student prepares for in college, the importance of physical education in the modern educational institution is being emphasized more and more every year.

Physical Education in the Oregon Agricultural College includes the following subjects: (1) Gymnastics, Individual and Class Instruction, (2) Athletics, Intercollegiate and Intramural, (3) Physical Examinations, (4) Corrective Exercises, (5) Hygiene, (6) Physical-Training Subjects not classified, (7) Teachers' Course in Physical Education.

Individual Instruction. This is given in the form of advice based upon the health examination of the student. Health examinations are given during the freshman and sophomore years. The examinations are utilized for the purpose of finding defects whose proper treatment may add to the health efficiency of the student. Advice given at this time is recorded and when a student reports for conference the advice on file is followed up. Students found with remedial physical defects are given special work of such a nature as the condition demands.

Physical Training. All students may elect any one of the three divisions in physical training.

Intercollegiate Athletics. All intercollegiate athletics are under the jurisdiction of the Board of Control composed of three members of the faculty, five members of the student body, and one alumnus. Representative teams are organized for baseball, basketball, cross-country running, football, soccer, tennis, track, and wrestling. Participation during the whole season of sport is accepted for one semester credit in physical training.

Intramural Athletics. The division of Intramural Athletics is supervised by a council consisting of the Director of Physical Education, Colonel of the Cadet Regiments, President of the Student Body, Editor of the Student Barometer, Professor of Intercollegiate Athletics, and a representative elected by each group of the Fraternities, Clubs, and Independents.

The department has organized this division so that every student who is physically fit to take part in athletic contests has the opportunity to participate in competitive scheduled sports. "Every O. A. C. man an athlete" is the slogan of the College.

For credit, attendance of two hours each week is required of all freshmen and sophomores who elect this subject. This division includes: **fall sports**; football, soccer, cross-country running, field events, swimming, tennis, fall baseball; **winter sports**; basketball, track and field events, wrestling, boxing, hand ball, volley ball, swimming, and advanced gymnastics; **spring sports**; baseball, track and field events, tennis, swimming, and cross-country running.

Gymnasium Classes. Individual and class instruction. Students who are unfit (determined by examination and tests) for work in the intercollegiate or intramural divisions, are assigned to the gymnasium classes, in which the students are given work for correcting defects, and for developing physical efficiency and muscular power.

Attendance of two hours each week is required of all freshmen and sophomores assigned to this division.

Equipment. The new Men's Gymnasium, two units of which have been completed is equipped with all modern gymnastic apparatus and facilities for properly carrying on the work of physical education and recreation. The main floor, 90x150 feet in dimensions, furnishes ample space for the most efficient type of gymnasium and indoor athletic work.

Features of the new gymnasium are: the large floor space providing for three regulation basketball courts, the large lobby for receptions, locker rooms and lockers to accommodate the men students, and shower bath and dressing rooms, rooms for accommodating the varsity and varsity teams. The new east wing provides an auxiliary gymnasium for apparatus work, three hand-ball courts, two wrestling and boxing rooms, and one large room for volley ball.

The O. A. C. field for athletics comprises a new quarter-mile track, varsity football field with bleachers for seating eight thousand spectators, one varsity baseball field, and six football, soccer, and baseball fields for intramural athletics.

Eight tennis courts have been constructed which afford adequate facilities for tennis.

The Armory, one of the largest of its kind in the United States, provides fine facilities for winter training during inclement weather in football, track, baseball, and various other sports. An indoor clay track, banked at the turns, which is but eight laps to the mile, and the extension clay floor space and high dome roof furnish facilities for conducting large winter track and field meets.

The swimming pool in the Y. M. C. A. Building is under the direction of the department and is supervised by an instructor.

The Treasurer's receipt for the \$1.50 physical-training fee entitles the holder to registration for full privileges of the department including: health examination, strength tests, locker, use of shower rooms, towels and soap, athletic fields, gymnasiums, etc.

TEACHERS' COURSE IN PHYSICAL EDUCATION

Many students expect to take up the profession of teaching after graduation from college. There is a great demand for full-time teachers of physical education in the high schools of the Pacific states. California has just passed a law requiring the employment of physical-training teachers for all high schools of the State. A bill is now being formed to be presented to the next legislature of Oregon for required public-school physical training. In anticipation of the increased demand for specialized teachers the department of Physical Education will arrange courses for training students for full-time teaching as well as for part-time teaching of Physical Education in connection with other subjects the schools.

COURSES IN PHYSICAL EDUCATION FOR MEN

The following courses are offered:

11. First year Vocational, physical training; first semester; 2 periods; $\frac{1}{2}$ credit. Required.
12. First year Vocational, physical training; second semester; 2 periods; $\frac{1}{2}$ credit. Required.
13. Second year Vocational, physical training; first semester; 2 periods; $\frac{1}{2}$ credit. Required.
14. Second year Vocational, physical training; second semester; 2 periods; $\frac{1}{2}$ credit. Required.
15. Freshman year, physical training; first semester; 2 periods; $\frac{1}{2}$ credit. Required.

16. Freshman year, physical training; second semester; 2 periods; $\frac{1}{2}$ credit. Required.

17. Sophomore year, physical training; first semester; 2 periods; $\frac{1}{2}$ credit. Required.

18. Sophomore year, physical training; second semester; 2 periods; $\frac{1}{2}$ credit. Required.

19. **Hygiene.** This course consists of a series of lectures on personal and impersonal hygiene, sources and modes of infectious diseases, immunity, industrial, and occupational diseases, etc.

Required of freshmen and vocational students; first semester; $\frac{1}{2}$ credit.

20. **Hygiene.** A continuation of course 19.

Required of freshmen and vocational students; second semester; $\frac{1}{2}$ credit.

ELECTIVE SUBJECTS IN THE TEACHERS' COURSE IN PHYSICAL EDUCATION

100. **Physical Diagnosis.** Physical department methods; history of Physical Education; school-room, school-yard, and playground plays and games; school hygiene and preventive medicine; special methods.

The course in Physical Education; first semester; 2 credits; 2 lecture periods; 4 practice hours each week.

101. **Methods of Coaching.** Methods of coaching in football, baseball, track, basketball, boxing, wrestling, and swimming.

Prerequisite: Phys. Ed. 100. The course in Physical Education; second semester; 2 credits.

102. **Elementary and Advanced Gymnastics.** Theory and practice.

The course in Physical Education; first semester; 1 credit; 2 hours each week.

103. **Elementary and Advanced Gymnastics.** A continuation of course 102.

The course in Physical Education; second semester; 1 credit; 2 hours each week.

104. **Red Cross Certificate, Aid to Injured.** A course for men.

The course in Physical Education; first semester; 1 credit; 1 hour each week.

105. Red Cross Certificate, Aid to Injured. A course for women.

The course in Physical Education; second semester; 1 credit; 1 hour each week.

106. Kinesiology. Essentials of anatomy as related to physical education. Muscles and their actions; analysis of the movements of the body, and their mechanism as a working basis for the selection of gymnastic exercises; lectures and demonstrations on skeleton and human body.

The course in Physical Education; first semester; 2 credits; 2 hours each week.

107. Therapeutic Gymnastics. Signs and symptoms indicating defects, with tests for their detection. Elements of corrective gymnastics; methods and exercises used for corrective and therapeutic purposes; types of variations from the normal, and the effect of corrective exercises.

Prerequisite: Phys. Ed. 106. The course in Physical Education; second semester; 2 credits; 2 hours each week.

108. Practice Teaching. Students will work under supervision as assistants in various courses. Conferences will be held with the instructors in charge, and reports submitted.

The course in Physical Education; first semester; 1 credit; 3 hours each week.

109. Practice Teaching. A continuation of course 108.

The course in Physical Education; second semester; 1 credit; 3 hours each week.

Students, before registering, should consult with the Director of Physical Education in the main office of the Men's Gymnasium Building.

PHYSICAL EDUCATION FOR WOMEN

_____, Professor
EVA BRUNELL, Instructor
LAURA CAMPBELL, Instructor
CHARLOTTE MACDOUGALL, Instructor

Purpose. The aim of this department is to bring each student to her best possible physical condition, and by a careful system of gymnastic training to correct faulty posture, to aid in the formation of habits of hygienic living, to establish a normal condition in the circulatory and respiratory systems, to secure bodily vigor, and to attain a healthy and symmetrical development, rather than the greatest increase in mere muscular power.

Special Corrective and Medical Gymnastics. Students who are shown by their physical examinations to be unfit for the work of the regular classes in gymnastics and sports, or to have physical defects, will be assigned to corrective classes where the work is light and the emphasis is laid on correct breathing and posture, relaxation and rest; or, whenever necessary, students will be given private work in medical or corrective gymnastics according to their individual needs. Thus the physical condition of each student is carefully diagnosed and supervised. The instructors encourage conferences concerning matters of health and personal hygiene and cooperate with the resident physician in all cases.

Requirements. Work in physical education is required of all women four periods a week in all full-years, special, optional, music and vocational courses, regardless of the student's course or classification. One credit a semester is granted for this work. For juniors and seniors who have completed courses 5, 6, 7, and 8, (two years regular work) the courses will be made elective or optional for women who pass a satisfactory physical examination and have a correct posture and carriage. Corrective gymnastics will be prescribed for all others, credit being allowed on the basis indicated above. At least four credits are required in Physical Education toward graduation.

Persons presenting credentials of work in physical education taken elsewhere may be given credit for such work in so far as it is equivalent to the requirements of this Institution.

Costumes. In order that the gymnasium costumes be hygienic and uniform, a regulation suit and shoes are required of all students. The shoes, orthopedic, are sold by the local dealers, subject

to the approval of the director; price \$3.50. The suits should be ordered at the gymnasium office, immediately upon arrival at the College. Good second-hand uniforms of outgoing girls will be for sale at about \$5.00, while the new uniforms cost \$6.00.

The Women's Gymnasium is equipped with lockers and dressing rooms and has accommodations for every College woman. A room for corrective gymnastics and a rest room, on the ground floor, are adequately equipped for their respective purposes. In the shower-bath room, hot and cold water is available throughout the year, and free towels are furnished to the students. The floor of the gymnasium is surrounded by a balcony running-track, and a capital playing space is provided for basketball and other indoor games.

The equipment includes horizontal bars, vaulting horses and bucks, parallel bars, swinging rings, traveling rings, Swedish box, stall bars, climbing ropes, ladders, dumb-bells, Indian clubs, and wands.

The girls' athletic field provides facilities for such games as out-door basketball, field hockey, soccer, tennis, baseball, and cross-ball.

All women pay the fee of \$1.50 each semester for which they are given use of all equipment, lockers, baths; are furnished with towels, medical supplies for injuries, and are given first aid, massage, and physical examinations.

COURSES IN PHYSICAL EDUCATION FOR WOMEN

The following courses are offered:

A. Required Courses. In the regular courses in Practical Gymnastics a variety of work is taught. Both the Swedish and German systems of gymnastics are used, and the best in both is adapted to the needs of the classes. Much emphasis is laid on correct posture and breathing. During her first two years of college work each student, irrespective of classification, if not required to take corrective gymnastics, must be enrolled in courses 5, 6, 7 and 8, in which the practical work in Physical Education is divided as follows:

Two periods a week in practical gymantsics, plus two periods a week in elective courses. (These may be chosen according to needs or desire of students, from the list of elective courses described below.)

1. Elementary Secondary Gymnastics (and Electives).

Required of all vocational or special students who have not completed a full four-years high-school course. First semester; first year; four hours a week; 1 credit.

2. Elementary Secondary Gymnastics (and Electives).

Required of vocational students; second semester; first year; four hours a week; 1 credit.

3. Intermediate Secondary Gymnastics (and Electives).

Required of vocational and special students who have not completed four-years high-school entrance requirements; after they have completed courses 1 and 2. Four hours a week; 1 credit.

4. Intermediate Secondary Gymnastics (and Electives).

Required of vocational and special students who have not completed four-years high-school entrance requirements; after they have completed courses 1, 2, and 3. Four hours a week; 1 credit.

5. Practical Gymnastics (and Electives).

Required of all students; first semester; first year; four hours a week; 1 credit.

6. Practical Gymnastics (and Electives).

Required of all students; second semester; first year; four hours a week; 1 credit. Prerequisite: Course 5.

7. Practical Gymnastics (and Electives).

Required of all students; first semester; second year; four hours a week; 1 credit. Prerequisites: Courses 5 and 6.

8. Practical Gymnastics (and Electives).

Required of all students; second semester; second year; four hours a week; 1 credit. Prerequisites: Courses 5, 6, and 7.

26. Corrective Gymnastics. Special attention is given to those having spinal curvature, round shoulders, narrow chests, forward heads, weak backs, pronated ankles, and other physical defects or weaknesses.

Required of all students who have need of remedial work.

10. Hygiene.

Required of all freshmen. One lecture a week; $\frac{1}{2}$ credit.

B. Elective Courses.

I. Practice

Credit in these elective courses is given according to the number of periods taken each week, $\frac{1}{4}$ credit being given for each period.

27. **Outdoor Sports.** Soccer, playground ball, cross ball, base crick, track athletics, etc. Open to all students.

28. **Basketball.** Open to all students physically qualified.

29. **Soccer.** Open to all students.

30. **Baseball.** Open to all students.

31. **Indoor Baseball.** Open to all students.

32. **Hockey.** Open to all students.

33. **Advanced Gymnastics (and Electives).** Open to specials in Physical Education and, by permission, to such other students as are qualified.

Prerequisites: Courses 5, 6, 7, and 8.

34. **Tennis.** Open to all students.

35. **Swimming.** Open to all students.

36. **Fencing.** Open to all students who have satisfactorily completed courses 5 and 6.

37. **Indian Clubs.** Open to all students.

38. **Aesthetic Dancing. (Elementary.)** Open to all students. The purpose of this course is to develop grace and freedom of movement. Greek dancing, now considered one of the most important phases of gymnastic exercise, is emphasized.

39. **Aesthetic Dancing. (Intermediate.)** Open to all students who have completed course 38.

40. **Folk Dancing.** Open to all students. In this course are taught a variety of peasant and national dances suitable for recreation or teaching.

44. **Archery.** Open to all students.

II. Theory

41, 42. **Theory of Gymnastics.** (Open to students who contemplate teaching gymnastics.) Lectures, recitation, and practice teaching. (School hygiene is included in this course.)

Two periods a week; 41 first semester, 42 second semester; 2 credits each semester.

43. Play and Playground Games. Open to all Summer School students.

Five periods a week for summer session; 2 credits.

This course is designed for public-school teachers or students interested in playground work, or wishing to specialize in Physical Education. The psychology of play, adaptation of play to varying ages, necessity of supervision of play, simple equipment for school playgrounds, organization of games, will be given briefly. The greater part of the time, however, will be given to the practice of various playground games and simple folk dances.

45. History of Physical Education. This is planned for students specializing in Physical Education and is supplementary to the History of Education.

1 credit; 1 semester.

47, 48. Massage. Theory and practice.

Prerequisites: Anatomy and Physiology. One lecture; one laboratory period; 1 credit each semester; 47 first semester, 48 second semester.

49, 50. Physical Examination and Prescription of Exercises. Open to students specializing in Physical Education. (Personal and Sex Hygiene are included in this course.)

Prerequisites: Anatomy and Physiology. One lecture; one laboratory period; 1 credit each semester; 49 first semester, 50 second semester.

51, 52. Methods and Practice Teaching. Open to students specializing in Physical Education.

Lectures, recitations, and teaching.

Prerequisites: Courses 41 and 42. Two periods a week; 2 credits each semester; 53 first semester, 54 second semester.

53, 54. Organization and Administration of Playgrounds. Open to students desiring to teach Physical Education.

Two periods a week; 2 credits each semester; 53 first semester, 54 second semester.

56. Advanced Hygiene. A course for upper class girls who are majoring in Physical Education. This course is a thorough resume' of personal, school, pelvic, and social hygiene.

One recitation; reports on assigned readings; essays; 1 credit.

57, 58. Massage and Medical Gymnastics. Practical work in Corrective Clinic.

Prerequisites: Courses 47 and 48. Three periods a week; 1 credit each semester; 57 first semester, 58 second semester.

59, 60. Applied Anatomy and Kinesiology. A study of the science of muscles, joint mechanism, and the detailed effects of various kinds of exercise upon them.

Prerequisites: Anatomy and Physiology (Zoology 201, 202). One period a week; 1 credit each semester; 59 first semester, 60 second semester. Required of students majoring in Physical Education. Text: Bowen's Applied Anatomy and Kinesiology. Supplementary text: Skarstrom's Kinesiology.

61, 62. Special Methods in Physical Education and Orthopedics. Lectures, recitations, and advanced teaching.

Prerequisites: Courses 41, 42, 51, 52. Two periods a week; 2 credits each semester; 61 first semester, 62 second semester.

SPECIAL WORK IN PHYSICAL EDUCATION

An arrangement of courses will be made for women desiring to specialize in Physical Education, either with the purpose of teaching it in connection with their Home Economics or other courses in the schools of the State; or with the desire of securing a thorough foundation for continuation of this line of study.

There are two distinct kinds of courses necessary for the special study of Physical Education: I. Theory; II. Practice.

I. Theory

High-school preparation advised: Physiology, Physics, Chemistry, Latin, German.

College courses recommended: Zoology (101, 102), Physiology and Anatomy (201, 202), English (31, 32), Expression (206, 207), German (three years, or a knowledge sufficient to study scientific and medical works), Theory of Gymnastics (41, 42), Embryology and Histology (104, 105), Neuro Physiology (209), General Psychology (101), Educational Psychology (102), Dramatic Interpretation (208, 209), Story Telling (191, 192), American Literature

(71, 72), Home Nursing (511), Massage (47, 48), Physical Examination and Prescription (49, 50), Organization and Administration of Playgrounds (53, 54), Advanced Hygiene (56), Mothercraft, Basketry, Methods and Practice Teaching (Phys. Ed. 51, 52), Sociology (250), Education (131), History of Physical Education (45), Special Methods and Orthopedics (61, 62), Applied Anatomy and Kinesiology (59, 60).

II. Practice

Practical Gymnastics (5, 6, 7, 8), Advanced Gymnastics (33), Corrective Gymnastics (26), Aesthetic and Folk Dancing (Elementary and Advanced), Fencing (Elementary and Advanced), Swimming (Elementary and Advanced), Archery, Sports of all kinds.

PHYSICS

WILLIAM BALLANTYNE ANDERSON, Professor
GILBERT BRUCE BLAIR, Instructor
GEORGE S. MONK, Instructor
_____, Instructor

An endeavor is made to adapt each course to the needs of those taking it. The Engineering students use a text which seems to be the best available for their needs; while the text used by the Agricultural students was written especially for such students. The "Physics of the Household" was likewise written especially for students of Home Economics.

In all courses the practical side of the subject is emphasized both in lecture and in laboratory work. At the same time the theory of the subject, in so far as it deals with the fundamental principles of Physics, receives the attention that its importance demands.

Since Physics and Chemistry are the two basic sciences, it would seem that every College graduate should have had at least a general course in each of these subjects. The department, accordingly, urges that at least all College students who have not had Physics in high school elect some work in Physics after consultation with the head of the Department of Physics. Those expecting to teach Physics in the high schools should by all means take several courses in College Physics.

Equipment. The physical laboratory has a good working equipment for the study of general physics, the apparatus being such as to allow a qualitative or quantitative verification of the most important laws of physics by the student in the laboratory, and by the instructor in the lecture room. In addition to the general laboratory, the department has two special laboratories, one equipped for electrical measurements and the other for photometry. A partial list of the apparatus found in these follows: standard cells, shunts, capacities and inductances; secohmeter; Leeds and Northrup potentiometer; Siemens and Halske standard ammeters, voltmeter, and portable testing set; Paul unipivot testing set; storage cells of large current capacity for ammeter and wattmeter calibrations; 10½-inch spark coil; Gaede pump; large Tesla coil; Leeds and Northrup photometer fitted with lamp rotator, rotating sector, Lummer-Brodhum screen, and Bechstein flicker photometer.

In the General Library will be found many recent Physics texts and allied works, as well as several Physics Periodicals, which are available to all.

The following courses are offered:

1. General Physics. A course in general physics, descriptive rather than mathematical in character, covering the subjects of mechanics and heat.

Prerequisite: Geometry. The courses in Agriculture and Electrical Engineering; freshman year; the courses in Forestry and in Industrial Arts, sophomore year; elective in the course in Commerce, freshman year; first semester; repeated second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Anderson, Physics, Vol. I.

General Physics. A continuation of course 1 covering the subjects of sound, light, electricity, and magnetism.

Prerequisite: Physics 1. Required as listed under course 1; second semester; 3 credits; 2 lectures; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Anderson, Physics, Vol. II.

101. Engineering Physics. A course in mechanics and heat.

Prerequisite: Trigonometry. The course in Highway Engineering, Logging Engineering, Mechanical Engineering, and Mining Engineering; sophomore year; first semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period. Fee \$2.00. Text: Reed and Guthe, Physics.

102. Engineering Physics. A continuation of course 101, covering the subjects of electricity and magnetism, sound and radiation.

Prerequisite: Physics 101. Sophomore year; second semester; 4 credits; 2 lectures; 2 recitations; 1 laboratory period. Fee \$2.00. Text: Reed and Guthe, Physics.

105. Electrical Physics. An advanced course in general physics.

Prerequisites: Physics 1 and 2; trigonometry. The course in Electrical Engineering; sophomore year; first semester; 3 credits; 1 lecture; 2 recitations; 1 laboratory period. Fee \$2.00.

106. Electrical Measurements. A continuation of course 105, in which the study and use of electrical measurements is emphasized.

Prerequisite: Physics 105. The course in Electrical Engineering; sophomore year; second semester; 3 credits; 1 lecture; 1 recitation; 1 three-hours laboratory period. Fee \$2.00.

133. Household Physics. A brief descriptive course with such applications as are of greatest interest to students in Home Economics extending over subjects of mechanics and heat.

The course in Home Economics; sophomore year; first semester; 2 credits; 1 lecture; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Lynde, Household Physics.

134. Household Physics. A continuation of course 133 and extending over subjects of electricity, light and sound.

The course in Home Economics; sophomore year; second semester; 2 credits; 1 lecture; 1 recitation; 1 laboratory period. Fee \$2.00. Text: Lynde, Household Physics.

202. Electricity and Magnetism. An advanced course, taking up the theory of electrical measuring instruments, etc., with suitable practice in the laboratory.

Elective; credit to depend on work done. Fee \$2.00.

211. Heat and Light. An advanced course, taking up the phenomena of heat and light in detail, including recent discoveries.

Elective; credit to depend on work done. Fee \$2.00.

220. Descriptive Astronomy. A brief elementary course in astronomy designed to acquaint the student with the most important facts relating to the heavenly bodies. The object of the course is to make the student an intelligent observer of the more common astronomical phenomena. Descriptive rather than mathematical in character.

Elective; second semester; 2 credits; 2 recitations or equivalent in lectures and observation work, depending upon weather conditions.

222. Wireless Telegraphy. A study of electric waves, their measurement, and their application to practical wireless telegraphy.

Prerequisites: Math. 51, 52; E. E. 101. The course in Electrical Engineering; junior or senior year; elective; second semester; 3 credits. Fee \$2.00.

Signaling and Wireless. In connection with the military training, the department offers special work in signaling and wireless.

A. Elementary Physics. An elementary or high-school course in physics.

The vocational course in Mechanic Arts; third year; first semester; 3 credits; 3 recitations; 1 laboratory period. Fee \$2.00.

B. Elementary Physics. A continuation of course A.

Second semester; 3 credits; 3 recitations; 1 laboratory period. Fee \$2.00.

SUMMER SESSION

The chief purpose of the Summer School is to afford an opportunity for study to those unable to attend during the academic year. The courses are arranged for elementary and secondary teachers interested in Agriculture, Commercial branches, Home Economics, and Manual Training; for credit in regular college subjects, as well as for prospective students deficient in entrance credit; for those interested in music and art; and for those desiring practical instruction in agriculture, household economics, and woodwork.

During the session, a two-weeks course in Agriculture and Home Economics is given for boys and girls of the upper grammar grades and high school. Most of those attending are winners of local, county, or state prizes in the School Industrial Club contests. A limited number of boys and girls not prize winners is also admitted. A special bulletin gives particulars.

A large faculty, chiefly regular College instructors, supplemented by a number of specialists from other institutions and from other states, the extensive equipment in class rooms, laboratories, libraries, shops, and experimental fields, are at the service of the students.

RAILROAD RATES

To those attending the Summer School, the transportation companies grant a special rate of one and a third fare for the round trip, on the certificate plan. In order to receive the benefit of the reduction, the purchaser must pay full fare to Corvallis, **securing a receipt from the ticket agent** at the time of purchase. This receipt must be countersigned by the College secretary at Corvallis, and on presentation to the ticket agent at Corvallis will secure rate of one-third for the return. This special rate takes effect three or four days before the opening date of the Summer Session and remains in force until the same length of time after the closing date. Tickets on this plan may be secured at any time while the school is in session, and are also good for return at any time.

ADMISSION AND EXPENSES

There are no entrance examinations or other educational tests for admission. Students desiring college credit must meet entrance requirements and satisfy all other College standards. The registra-

tion fee of five dollars entitles the student to admission to as many courses as he cares to attend during the entire session. Private, individual lessons in music will be given at the regular price charged during the school year; students taking music only, will not pay the College registration fee.

The College dormitories, conveniently situated on the Campus, will accommodate about three hundred students with board and lodging. A charge of six dollars will be made to cover the cost of heat, light, use of laundry, etc. The rooms are provided with bed, mattress, table, and chairs. Each room has closet, hot and cold water, and electric light. Each student who desires to occupy one of these rooms must bring pillows, pillow-cases, sheets, blankets or comfort, bed-spread, towels, napkins, and soap. The laundry room will be open for the use of students at Waldo Hall without extra charge.

Table board will be furnished at Waldo Hall at the rate of five dollars a week. Lists of private lodging and boarding places will also be provided and every assistance rendered in finding satisfactory accommodations. Furnished rooms for light housekeeping may also be had.

Allowing \$36.00 for board and room, \$5.00 registration fee, and \$1.00 for drayage on baggage, \$18.00 for laundry and incidentals, the minimum cost for the entire six weeks need not exceed \$60.00, exclusive of railroad fare. Those who take courses requiring textbooks and laboratory fees must make some additional allowance.

SOCIAL AND OTHER FEATURES

The informal and recreation diversions from the class and study routine have not only a social but an educational value as well. These are so controlled and directed as to be inexpensive and unobtrusive. Opportunity for students to become acquainted with each other and with the instructors outside the class room is afforded during the informal receptions and parties each week.

The College numbers among its faculty some of the best-known popular lecturers in the State. Several will be heard in illustrated stereopticon addresses on interesting phases of Oregon's industrial development. At least once each week an evening will be given up to entertainment, either in the form of a lecture of general interest, or a musical concert.

The tennis courts, baseball field, gymnasium, and other recreational resources of the Institution may be used by the students and

instructors, free of charge. Boating on the Willamette and Mary's rivers, picnics and excursions to various points of interest, including Mary's Peak, and week-end trips to the ocean at Newport, will also be available for those who desire to indulge in these recreations. The social features of the Summer School are given careful attention, so they may not come in conflict with the regular work, but at the same time be full of pleasure and interest.

SPECIAL ILLUSTRATED BULLETIN

Each spring, special circulars are issued, giving complete description of the various courses offered, statement in detail of living and other expenses, list of instructors, directions for registrations, and other matters. These bulletins are illustrated with interesting views of the College Campus. Copies may be obtained by addressing the Oregon Agricultural College, Corvallis, Oregon.

WINTER SHORT COURSES

For many years the Oregon Agricultural College has offered each winter one or more courses of lectures and demonstrations which have been known as Winter Short Courses. These courses have been so generally successful and have called forth so many expressions of approval from those in attendance, that the work has expanded until several courses are given in each of the following schools:

School of Agriculture.

School of Commerce.

School of Engineering.

School of Forestry.

School of Home Economics.

Each of these courses, except the one in Industrial Arts, which will consist entirely of practical work in the shops or in the draughting room, will consist of a series of lectures supplemented by demonstrations, and by practical exercises in the dairy, the orchard, and the various laboratories. The work is so arranged that each hour of the day, from 8 until 5, may be filled with lectures and laboratory or field demonstrations. The work offered will be adapted to the various needs of farmers, fruit growers, dairy-men, mechanics, or of women in the home.

The various courses are so planned as to provide the largest amount of practical information in the short time available. The subjects to be discussed are those in which every farmer should be interested, and the aim will be to present them in the most practical manner possible. The laboratory and collections, the shops, the creamery, the orchards, the College farm, the cutting, fitting, and sewing rooms, the dining rooms and kitchens—all offer facilities for demonstration or for practical exercises by the students attending these courses. A pleasing and profitable feature of these courses will be a series of lectures by prominent men who are qualified by successful experience to speak upon some particular phase of Agriculture.

Special lessons in Music may be taken by short course students at the regular rates listed under the School of Music.

Students should report to the Registrar for registration and for assignment to the various classes. The inclusive dates of these short courses are as follows: Winter Short Courses, November 4 to December 21; Forestry Short Course, November 4 to April 11,

Special short courses on particular subjects may be announced from time to time. A list of boarding and lodging places may be consulted at the office of the Y. M. C. A.

No entrance examination or other educational test will be required; but no one will be received who is less than sixteen years of age.

There will be no fees whatever for attending the exercises of Farmers' Week. Those who attend the other courses will be expected to pay a registration fee of \$1.00. In addition, students who elect certain courses will be expected to pay small fees, to cover the cost of materials used.

Board and lodging may be had in Corvallis at \$4.50 to \$6.00 a week.

Railroad Rates. The railroad companies grant a rate of one and one-third fare for the round trip on the usual certificate plan.

A circular descriptive of all Short Course work will be issued about November 1, and may be obtained by addressing the Oregon Agricultural College, Corvallis, Oregon.

AGRICULTURE

The School of Agriculture is making two important changes in their short course. It has been decided to increase the short course from four weeks to six weeks and to hold it earlier in the year. The course will be given November 4 and extend to December 21.

The course is one in general agriculture and includes special lectures and laboratory work in such courses as Dairying, Farm Crops, Stock Feeding and Management, Stock Judging, Poultry, Soils, Horticulture, Farm Mechanics, Drainage, and Farm Management.

COMERCE

Commercial Lecture Course. To meet the demand for a short, practical business course, the work outlined below will be offered in a series of lectures under the same conditions and entrance requirements as other winter courses.

Bookkeeping. This course will embrace the fundamental principles of double entry bookkeeping. It will be made strictly practical and only sufficient theory will be introduced to give the student a firm foundation for his work. The basis of the work will be a study of a model general store equipped with the latest labor-saving

methods of bookkeeping and office practice. Eight lectures and demonstrations.

Business Law. The course in Business Law will begin with the thought that there are certain fundamental principles of commercial law with which everyone should be familiar, and will include the following important subjects: property, contracts, negotiable instruments, interest and usury, bailment, agency and partnership, and real estate. Eight lectures.

Business Forms Letter Writing. The purpose of this course will be to familiarize the student with various forms used in general business practice. Exercises will be required illustrating both principle and practice in a clear, simple understandable manner. In the work of letter writing the correct form, wording, and general arrangement of the business letter will be taken up. Original letters, received from the most important manufacturing concerns and business houses of the United States, will be studied. Eight lectures.

Penmanship. The work in penmanship will embrace the study and practice of the best forms and style of practical business writing. The primary aim of the course will be to develop an easy, rapid, legible business hand. Eight lectures a week.

Typewriting and Office Methods. The work in typewriting will be outlined to suit the requirements of the individual student. The beginner will be taught the correct method of fingering, the uses of the various parts of the machine, the care of the machine, manifold, and the correct arrangement of the typewritten letter or form.

Farm Accounting. A complete analysis of farm accounts by different methods, in which simplicity, accuracy, and labor-saving are emphasized; household and personal accounts; cost accounting and special records; cost of production; special cost records; labor records; milk records; poultry records; etc.; the farm plot; office methods; business organizations; business correspondence and business forms. Eight lectures and demonstrations.

Rural Law. The general principle of common and statutory law are discussed and explained; special phases of law affecting the farm, such as titles to real estate, deeds, mortgages, county records, etc.; landlord and tenant; eminent domain, and right-of-way; water rights and boundaries; laws governing shipping, insurance, banking, etc.; court procedure. Eight lectures.

Rural Economics. The fundamental principles of production, distribution, and exchange with special reference to rural life. Rural labor problems, farm finance, legislative problems affecting rural life, cooperative organizations, marketing products, advertising, the economics of machinery, transportation, etc. Eight lectures.

HOME ECONOMICS

These courses are designed for all women who are interested in the practical and scientific working out of household problems, and who are unable to avail themselves of a regular course in Home Economics. Many agricultural men and their sons yearly take advantage of the Short Courses which deal with the problems of the farm, such as feeding of cattle, judging of corn, study of soils, etc. It is to meet the demand of Oregon women who are interested in the correct feeding of the family, the judging and selection of materials used in the home, the making of suitable and attractive clothing, and a study of sanitary conditions which lead to the health, comfort, and happiness of the family, that this course has been established, and is to be carried on.

The courses outlined below are essentially those that are usually sought by patrons of the Short Course. Some variation, to meet the special needs of each session or to conform to the teaching program of the School of Home Economics, will doubtless be advisable. Consult the special circular and program of courses issued each year for the Winter Short Course.

Food Preparation. This course deals with the subject of foods and food preparation in its scientific and economic aspect. It is the study of the nutritive principles as they are found in various foods, and the method of cooking foods to retain those principles in a form most completely and easily digested; serving of food in simple and attractive form; economy of money, time, and labor being the watchword.

Special Food Preparation. This course consists of the selection and preparation of foods for children of different ages, adults in active life, the aged, and invalids.

Household Management.

General health and welfare of the home.

- (a) Economy of time, labor, and income.
- (b) Sanitation of the home.
- (c) Home nursing.

Note.—These courses have been planned to meet the needs of those who have had previous work, as well as those who are entering for the first time.

Plain Sewing. This course is planned for those women wishing instruction in the economical purchasing and making of household linens and underwear; the mending and renovating of old garments usually found in all households; the draughting of patterns for underwear to the student's own measurements, together with the practice of interpreting and using purchased patterns.

All women are eligible to this course.

Dressmaking. This course offers instruction in the principles of dressmaking; the taking of accurate measurements; the draughting and use of patterns; the choosing and economical cutting of materials; the making of at least one dress, with special emphasis on artistic color combinations and suitable design.

Tests will be made showing the adulterations of textiles; and simple methods of detecting the adulterations in dress materials will be given.

This course is given for the women who have had experience in sewing and dressmaking.

Advanced Dressmaking. Students who have previously taken one winter's short course will be given instruction in advanced dressmaking, if they so desire.

Millinery. This work will be given by lectures and demonstrations only. No practice work will be given to the students.

Basketry. This course will be given three times each week.

Care of Children. Three lectures each week will be given on the care of children. Only mature women will be admitted to this class.

Camp Cookery. The course in Camp Cookery consists of two laboratory lessons each week. It is especially designed for men, but women are admitted if the class is not already full. Only twenty students can enter these classes.

ENGINEERING AND INDUSTRIAL ARTS

It is the purpose to teach the subjects offered in a straightforward, practical manner, which can be readily grasped and understood by farmers, mechanics, and others who have had only the advantage of a common school education.

Woodworking. Considerable latitude will be allowed in choosing the particular line of work desired in this department as set forth under the following headings:

(a) A course for those not familiar with the care and handling of tools. This course affords instruction in the correct methods of using, sharpening, and caring for the tools of the carpenter's bench. The work is exemplified by exercises in planing, sawing, chiseling, and the construction of useful articles of furniture.

(b) The Steel Square and Its Use. This work includes laying out rafters, braces, stairs, and other work with the steel square. Lectures will be given on the use of the square, after which the actual construction of work will be undertaken by the student.

(c) Instruction in the use of paints, stains, and varnishes.

Blacksmithing. Two lines of work are offered in blacksmithing:

(a) Students with no previous knowledge of blacksmithing are taught how to build and manage a forge fire; how to draw, bend, upset, forget, and weld iron; how to make chains, clevises, hooks, gate-hinges, whiffletrees, and neck yoke irons, and other useful articles.

(b) A course in working and welding steel for those with some general knowledge of blacksmithing. This course includes a study of the different grades of steel; the effect of heat treatment on the quality and temper of steel; the use of the color scale in tempering; and finally the forging, dressing, and tempering of steel tools.

Road Building and Maintenance. A course of lectures on practical road construction and maintenance. This course will consist of three or more lectures each week during the short course on the fundamental principles of road construction and maintenance, and will include lectures on the following subjects: Alignment; grade; drainage; the road census and the interpretation of its results; selection of type of roads; maintenance of different types of roads; the road drag; road machinery; culverts and small bridges, etc.

Special laboratory work will be arranged for those desiring to study the physical properties of road building materials.

Concrete. A course of lectures will be given on the theory of concrete and on its practical application to farm and highway structures, walks, etc. In this course proper proportioning for different classes of work, proper aggregate, causes of failure, costs, and methods will be discussed.

SCHOOL OF MUSIC

The School of Music is a self-supporting department of the Oregon State Agricultural College, organized in 1908 under the present management by authorization of the Board of Regents, in response to insistent demand therefor from the student body.

The School of Music serves the State as efficiently as possible at no greater expense to students than is necessary, rates of tuition being no greater than in other similar standard colleges and universities.

The studious atmosphere, wholesome discipline, adequate modern musical equipment, and attractive environment of Oregon State Agricultural College are favorable alike to those just beginning music study and to advanced students, all of whom may enter at any time and advance to graduation as rapidly as consistent with creditable scholarship.

The time required for completion of the various courses offered is somewhat dependent upon the age, temperament, talent, ability, and character of work of each student.

The members of the faculty are accomplished performers. As instructors they are skilled in the psychology, and experienced in the practice of teaching. In undertaking these courses students may confidently anticipate maximum gain in musical efficiency at minimum expenditure of time and money.

FACULTY

DEPARTMENT OF VOICE

WILLIAM FREDERIC GASKINS, Mus. Bach.

Director of the School of Music.

Professor of Music.

Professor of Voice Culture, Singing, Conducting, Music History.

Graduate student Hillsdale College Conservatory; Graduate student American Conservatory; Graduate student of

Karlton Hackett, Chicago; J. D. Mehan, New York, F. X. Arens, New York.

GENEVIEVE BAUM-GASKINS

Instructor in Voice Culture and Singing.

Graduate American Conservatory, Chicago; Student of William Nelson Buritt, New York; Karlton Hackett, Chicago; William Frederic Gaskins, Chicago; John Dennis Mehan, New York.

DEPARTMENT OF PIANO**GENEVIEVE BAUM-GASKINS**

Instructor.

Student of John J. Hattseaedt, Chicago; Graduate American
Conservatory, Chicago.

MAY BABBITT-RESSLER

Instructor.

Student of Arthur Foote, Boston; Leschetizky method studied with
Jeanne Marie Mattoon, New York.

GUSTAV DUNKELBERGER, Mus. Bach.

Instructor.

Graduate of Bethel College Conservatory; Graduate student of
American Conservatory, Chicago; student of Heniot Levy,
Arthur Oluf Anderson, Adolph Weidig, Chicago.

DEPARTMENT OF ORGAN**GENEVIEVE BAUM-GASKINS**

Instructor.

Student of Wilhelm Middleschulte, Chicago.

DEPARTMENT OF STRING INSTRUMENTS**CARL GRISSSEN**

Student of Edmund Singer, Stuttgart; Gustav Hollaender, Berlin;
Carl Halir, Berlin; Samuel de Lange, Berlin;
Joseph Mayer, Berlin.

DEPARTMENT OF THEORY**WILLIAM FREDERIC GASKINS, Mus. Bach.**

Theory of Music. History of Music.

GUSTAV DUNKELBERGER, CORINNE BLOUNT

Harmony, Counterpoint, Harmonic Analysis, Composition

CARL GRISSSEN

Orchestration.

DEPARTMENT OF BAND INSTRUMENTS**HARRY LYNDEN BEARD**

Student of Herbert L. Clarke of Sousa's Band.
Instructor in Theory and Art of Playing Band Instruments.
Band Conducting.

COURSES IN MUSIC

In these courses the following subjects are included: elements of music, history of music, interpretation, languages, music form and analysis, music pedagogics, song singing, oratorio singing, opera singing, choral singing, organ playing, organ structure, piano playing, piano structure, sight reading, stage deportment, stringed instrument playing, wind instrument playing, brass instrument playing, theory, harmony, counterpoint, composition, voice culture.

The following courses are offered:

1. **Voice.** Exercises will be given for correct breath control; purity of tone production; freedom of action and blending of registers; articulation and correct pronunciation and enunciation of vowels and consonants; elements of phrasing and style. Students must appear on programs if requested, singing from memory, and attend all rehearsals and recitals unless otherwise instructed by the Director.

Required: Two lessons a week in voice, practice with instrument one hour daily; harmony, course 10; and history of music, two hours a week each; choir and chorus practice. Physical education.

2. **Voice.** This course consists of exercises for tone placing; phrasing and style; legato, marcato, and portamento delivery. Physiology of the vocal mechanism. First year Italian, or French, at student's option unless otherwise advised by the Director. Songs and exercises of medium grade of difficulty. Attendance and performance at recitals and rehearsals required, unless otherwise instructed by the Director.

Required: Two lessons a week in voice; practice with instrument one or two hours daily; harmony, course 11, Italian, or French; physical education.

Prerequisite: Course 1 or its equivalent.

3. **Voice.** This course includes the study of tone color, agility, the trill, messa di voce, recitation, declamation, phrasing, style; songs in English, French, Italian; the regular second year study of one of the above foreign languages at the student's option, in the department of Modern Languages, unless otherwise advised by the Director. Attendance and performance at recitals and rehearsals required unless otherwise directed as above, singing from memory on programs of the School of Music when so required.

Required: Two lessons a week in voice; two lessons a week in harmony; course 14, French, or Italian, at student's option, second year study as required in department of Modern Languages; choir and chorus practice; physical education.

Prerequisite: Course 2 or its equivalent.

4. Voice. This course includes advanced study of vocal technique by means of difficult exercises, songs, oratorios, operatic arias, declamation. Advanced composition throughout the year; courses 16 and 17. Attendance at rehearsals required in preparation for public appearances, and at recitals, singing from memory. For graduation a public recital must be given as arranged by the Director, unless he may specify to the contrary. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 3 or its equivalent.

5. Piano Preparatory Course. For beginners. Training of the hand, fingers, wrist, and arm. Extended preparation for scales and arpeggios. Easy studies by Bertini, Duvernoy, Loeschhorn, and others. Selections from easier works of Clementi, Haydn, Beethoven, and other easy appropriate compositions.

Required: Two lessons a week in piano; practice with instrument, one to three hours daily.

6. Piano. Scales and arpeggios. Exercises for endurance, speed, accent, and rhythm. Etudes from Czerny, Cramer, Moszkowski, and others. Easy sonatas of Haydn, Mozart, and Beethoven. Easy compositions of Mendelssohn, Schubert, Schumann, Grieg, and others.

Required: Two lessons a week in piano; harmony, course 10; two lessons a week in music history for thirty-six weeks; practice with instrument, two to four hours daily. Physical education.

Prerequisite: Course 5 or its equivalent.

7. Piano. Scales in various forms and technical exercises adapted to the particular needs of the student. Etudes of Czerny, Cramer, Ruthardt, and others. Suites and inventions by Bach. Mozart, Beethoven, and Weber sonatas of moderate difficulty. More difficult selections from Mendelssohn, Schumann, Chopin, Liszt, and others. Transposition of easy hymns, sight reading, and memory training.

Required: Two lessons a week in piano; in harmony, course 11; practice with instrument, three to five hours daily. German or French as advised by the Director. Physical education.

Prerequisite: Course 6 or its equivalent.

To complete this course satisfactorily the student must fulfill the requirements above outlined and perform in public when requested by the instructor and approved by the Director.

8. Piano. Exercises based on the technical difficulties in compositions studied in this course. A limited number of etudes by Rubinstein, Henselt, Haberbier, and others. Well-tempered clavier. The more difficult sonatas of Beethoven and solos by Mendelssohn, Chopin, Schumann, Grieg, Liszt, Brahms, and others. Concertos by Mozart, Mendelssohn, Beethoven, and Moscheles.

Required: Two lessons a week in piano; harmony, course 12; two lessons a week in counterpoint, course 14. German or French. Physical education.

Prerequisite: Course 7 or its equivalent.

To complete this course satisfactorily the student must fulfill the requirements above outlined and perform in public when requested by the instructor and approved by the Director.

9. Piano. Comprehensive study of the principal classic and romantic composers. Etudes by Chopin and Moszkowski. Solo works of modern composers. Concertos by Schumann, Chopin, Rubinstein, and others.

Required: two lessons a week in piano; harmonic analysis, course 16; composition, course 17, and orchestration, course 18; practice with instrument, three to five hours daily. Public performances under conditions approved by the Director.

Prerequisite: Course 8 or its equivalent.

For graduation, students are required to perform publicly under the direction of the School of Music, playing a program not less than one hour in length, arranged by the instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Theory. The courses in theory will comprise systematic and progressive study in the science of music. Consideration will be given to the theories of acoustics, to notation, scales, keys, modes, sight reading, intervals, melodic progression, tempo, dynamics, rhythm, and ear training. Advanced theory will embrace harmony, counterpoint and subdivisions thereof, music history, concluding with form, composition, and orchestration. For graduation, thirty-six weeks study of theory is required, or the equivalent thereof, outlined as follows in courses 10 to 18, inclusive.

10. Harmony. Consideration will be given to the theories of acoustics, the formation of the diatonic scale, to intervals, chord

construction, the relative importance of triads within one key, connection of primary triads, rhythm, the elements of melodic construction, and part writing. Harmonization of melodies and unfigured basses. Original periods.

11. Harmony. Key relations. Chords of the seventh. Direct and extraneous modulation. Altered and mixed chords.

Prerequisite: Course 10.

12. Harmony. Inharmonic tones. Accompaniment. Original work. Study of the various modern harmonic theories.

Prerequisite: Course 11.

13. Ear-training. Aural recognition of intervals demonstrated orally and in writing. Singing of diatonic and chromatic intervals from given tones. Writing at dictation of moderately difficult melodies and harmonic progressions.

14. Counterpoint. Simple counterpoint in five species employing from two to eight parts. Original exercises. Contropuntal chorale elaborations.

Prerequisite. Course 11 or its equivalent.

15. Counterpoint. Double, triple, and quadruple counterpoint. The canon, invention, and the various species of fugue, single and double.

Prerequisites: Courses 12, 13, and 14.

16. Harmonic Analysis. Detailed analysis of representative works of the masters and other compositions. Harmonic memorizing of moderately difficult selections.

Prerequisites: Courses 12 and 13.

17. Composition. The application of harmonic material in original exercises in the various forms of composition, including the primary forms, the song, theme with variations, etude, rondo forms, sonatina and sonata.

Prerequisites: Courses 12, 13, and 14.

18. Orchestration. The arrangement of music for orchestra. The theoretical study of orchestral instruments and their functions.

19. Violin. This course is preparatory, and designed to develop correct fingering, free bowing, and accuracy as to pitch, rhythm and intonation.

Studies. Sevcik School, Greenberg, major scales, minor scales in the first position; studies by Hohman, Kayser, and others, elementary solos; special sight reading duos by Mazas and Dancla.

Other appropriate studies may be substituted for the above, if approved by the Director, as acceptable equivalents, the same to be satisfactorily performed before entering course 20.

Students must appear in public recitals when required by the Director, playing from memory.

Required: Two lessons a week, harmony, music history, as in courses 10 and 11.

20. Studies by Kayser, Wohlfahrt, Schradieck, Mazas, Dont, and Kreutzer. Scales by Musin, Schradieck, or acceptable equivalents. Suitable solos, concertos, sonatas, etc. Students must appear in performances at public recitals when required by the Director, playing from memory.

Required: Two lessons a week, harmony, courses 11 and 12, and Counterpoint, course 14.

Prerequisite: Course 19.

21. This course consists of advanced studies by Dancla, Fiorillo, Singer, Rode, Gaviniès, Paganini; solos by Dvorak, Brahms, Vieuxtemps, Rovelli, Spohr, De Beriot, Viotti, Wieniawski, or other acceptable equivalents. Students must appear in public recitals when requested, playing from memory.

Required: Two lessons a week, harmonic analysis, composition, French or Italian as in course 8. As a qualification for graduation students are required to perform publicly, under the direction of the School of Music, a program not less than an hour in length, arranged by the Instructor and approved by the Director. A diploma will be issued upon the satisfactory completion of this course.

Prerequisite: Course 20.

The Orchestra. Students of string instruments in attendance at the College, who are sufficiently advanced, may be admitted to membership in the College Orchestra by arrangement with the Conductor on such terms as may be approved by the Director. It is the intention of the management to encourage in every reasonable manner the development and maintenance of a good orchestra under competent progressive leadership. Students are invited to investigate these opportunities for excellent training in orchestra routine and solo playing. Such experience and drill are of great educational and cultural value.

The Orchestra library consists of works by the following composers: Dvorak, Brahms, Tschaikowsky, Grieg, Gounod, Verdi, Mendelssohn, Beethoven, Elgar, Wagner, Offenbach, Strauss, and others.

Ensemble: Sonatas for violin and piano; string trios; quartettes for two violins, viola, and 'cello; and for four violins, are available for study. All students in the above classes, or registered in any of the above courses, must perform from memory in public when requested by the Director. Membership in the ensemble classes is free, and instruction is to be given by the principal violin instructor.

BAND INSTRUMENTS

Instruction will be given by the regular College band leader in the use of brass, wood-wind, and percussion instruments.

To become a member of the College Band, a student must pass a satisfactory examination in the elements of music and ability to perform on his instrument.

Members are required to attend rehearsals each school day, and a reasonable amount of individual practice is expected.

There is no charge for instruction in the band. Each member must furnish his own instrument and music stand, except basses, baritones, altos, and drums, which are furnished by the College.

Any student desiring to enter the band should see that his instrument is in low pitch.

The courses for the various band instruments are as follows:

22. **Cornet.** Methods by Arban; characteristic studies by St. Jacome.

23. **Clarinet.** Methods by Dieppo; studies by Dieppo and Blume.

24. **French Horn.** Methods by Franz; studies by Franz and Hayffman.

25. In all other band instruments, including the oboe, bassoon, saxophone, alto, and bass clarinets, drummer's trapps, xylophone, and orchestra bells, the courses will be similar to those given above.

The work in theory required to complete these courses is that outlined in courses 6 and 7.

GENERAL INFORMATION

Any student in the Oregon Agricultural College with a satisfactory record in scholarship in his major course may take at least one hour a day in music, by arrangement with the Director.

The authority to register and assign all applicants for music instruction is vested solely in the Director, who must first be consulted for the arrangement of details of registration, or at any time when information is required that pertains to study in the various departments of the School of Music.

Students in the School of Music may enter classes in the several departments of the College; and in order to enhance their general culture are encouraged to take at least one study throughout the school year other than the work required in the regular music courses.

Applicants for instruction may take complete or part courses. Those registering for the former are classified as "regular music," while the others are classified as "special music."

"Special Music" students have the option of selecting such music studies as they desire by registering for the same with the Director in the regular manner and at the catalogue rate of tuition.

Non-resident young women are required to live in the dormitories, where their conduct is subject to the approval of the Preceptress. Outside rooming and boarding places may be obtained, subject to the approval of the College authorities. The rates for board and room are listed elsewhere in detail.

Students registered for study in the regular courses of the Oregon Agricultural College School of Music are subject to the same rules and regulations as all regular students in other courses.

No student is permitted to omit lessons or practice without sufficient excuse, and no refund will be made for absence from lessons or practice or for discontinuance, except in cases of severe personal illness; for such unavoidable absence, lessons may be made up only by appointment, and before the expiration of the term.

Lessons falling on legal holidays, or on special holidays petitioned for by the student body or by special student organizations, which may be granted by the College authorities, will not be made up.

Students will not be permitted to transfer tuition accounts to others, nor to receive credit for tuition fees beyond the assigned

registration period, except in cases of severe personal illness, or similar extreme necessity, attested by the College Physician, and then only by making suitable arrangements with the Director.

The College year in the School of Music consists of thirty-six weeks, divided into terms of about twelve weeks each, the first term beginning at the opening of the College on September 23, 1918.

Tuition. Private individual instruction is given in lessons of thirty minutes each, in all departments of the School of Music. Class instruction in theoretical branches is required of candidates for graduation, as specified in the preceding outlines of courses. Terms for instruction are as follows:

Voice Culture and Singing — Professor Gaskins, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Organ — Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....	\$24.00
Two lessons a week, a term.....	48.00

Piano — Genevieve Baum-Gaskins, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Piano — May Babbit-Ressler, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Piano — Instructor Dunkelberger, private instruction:

One lesson a week, a term.....	\$15.00
Two lessons a week, a term.....	30.00

Violin, Viola — Instructor Grissen, private instruction:

One half-hour lesson a week, a term.....	\$15.00
Two half-hour lessons a week, a term.....	30.00

Mandolin, Banjo, Guitar — Instructor Brewster, private instruction:

One half-hour lesson a week, a term.....	\$12.00
Two half-hour lessons a week, a term.....	24.00

Band Instruments — Instructor Beard, private instruction:

One lesson a week, a term.....	\$10.00
Two lessons a week, a term.....	20.00

Music History — Professor Gaskins, class instruction:

Two hours a week, one term.....	\$ 3.00
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Theory—Courses 10 to 18 inclusive, Instructors Dunkelberger,

each course, a term.....	\$ 7.50
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PRACTICE

Rooms located in the Administration building have been suitably furnished for the use of students wishing to practice in private. These rooms may be rented for about one-third the cost of using pianos located in private houses, and without any of the disadvantages in connection therewith. They have steam heat, good ventilation, electric light for night practice, good janitor service, and are furnished with good pianos, kept in tune by the College. Students living in the College dormitories are required to practice upon these pianos. Students living away from the campus may arrange with the Director for practice on the same terms and conditions, as follows:

Piano—

Term of twelve weeks, one hour a day.....	\$ 5.00
Two hours	7.50
Three hours	10.00
Four hours	12.50
Five hours	15.00

Organ—

Term of twelve weeks, one hour a day.....	\$12.00
Two hours	18.00

The pipe organ is a new, modern Kimball two manual, concave pedal board instrument of beautiful tone.

For additional information address William Frederic Gaskins, Director of the School of Music, Room 30, Administration Building, Oregon Agricultural College, Corvallis, Oregon.

THE EXPERIMENT STATION

ARTHUR BURTON CORDLEY, Director
CLAUDE ISAAC LEWIS, Vice Director

The Agricultural Experiment Station bears an important relation to the College, as the scientific investigations conducted by the staff strongly support the instruction given in the class room and through the Extension Service. Aside from the original investigations of economic significance to agriculture, the work of the Station affords daily object lessons in modern farm methods.

About 650 acres of land are available for the use of the College and Station workers. This land is utilized by the various departments represented in Station organization, including the departments of Chemistry, Farm Crops, Farm Management, Farm Mechanics, Horticulture, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Entomology, Bacteriology, Pharmacy, and Botany and Plant Pathology. Each department is actively engaged in the scientific investigation of problems presented by the different branches of agriculture.

In addition to the experimental work carried on by the departments of the School of Agriculture, experimental work is also conducted by the School of Engineering, the School of Home Economics, and the School of Pharmacy.

The value of such work, as an object lesson to the students in the various fields of study, can hardly be overestimated. Its value to the State, from the point of view of economic progress, has been greater, in the estimation of many careful observers, than the entire cost of the College to the people.

As an illustration of the comprehensive character of the investigational work carried on by the Station, the following brief summaries of projects, by departments, is presented:

Agricultural Chemistry. This department, either independently or in cooperation with other departments of the College, has under way a considerable number of experiments that are of wide significance both to the economic interests of the State and Nation and to the cause of science. Experiments with arsenical sprays, that represent a total annual expenditure throughout the country of six to eight million dollars, are directed to the object, first, of determining exactly how the efficiency of these arsenicals is best conserved, and second, how a less expensive form of a similar insecticide may

be developed. The first object has been partly accomplished, with promise of conclusive results, and the second, through the use of arsenate calcium, seems also within reach of fulfillment. A study of the acid or sour soils of the State of Oregon is being made to ascertain, if possible, by means of pot experiments and laboratory tests, the causes of acidity and to what degree applications of various forms of lime will correct this abnormal condition. It has been found that some acid soils respond to lime treatment while others do not. A physical and chemical examination of these types of soil is being made as to treatment with different calcium salts in order that information regarding this inconsistency may be obtained. In cooperation with the Southern Oregon Branch Experiment Station, at Talent, the department has made a complete chemical survey of the soils of the Rogue River Valley, with a view to determining the deficiencies to be supplied by fertilizers. Sulfur is found to be the element, which, when added to certain of these soils, increases the production of alfalfa and other legumes by percentages running into the hundreds. These fertilizer experiments promise some very striking and valuable results. Incubation experiments, now reaching completion after several years of laborious and painstaking study, go to show that varying the conditions of incubation varies also the quality of the chicks produced. Limited experiments with Loganberry juice have been conducted to determine what jelly-making acids are present in the juice, what modifications appear in the juice of the second pressing, and what use may be made of the pulp. Soil analyses conducted in connection with the reclamation service have comprehended one-half million acres of land. Routine analyses of commercial fertilizers, especially of limestone, have shown the need of caution in the use of these fertilizers at current prices unless the quality is high. Analyses of all insecticides on the market are on file at the Chemist's office, where information concerning any of them may be had, free of charge, on application.

Animal Husbandry. Experiments in Animal Husbandry, which comprehend tests with horses, beef cattle, sheep, and swine, are conducted partly at the Corvallis Station and partly at the Eastern Oregon Branch Stations. Experiments with horses are directed to determine the cost of horsepower for various types of farm and other work; the amount of work that may reasonably be expected from a horse; the cost of keep; etc. Experiments with beef cattle,

conducted chiefly at Union, are concerned with fattening steers on various rations and with methods of maturing range cattle. Experiments with sheep have been directed to determine the cost of production, the carrying capacity of different types of pasture, methods of fattening sheep, maturing ewes, and methods of rearing and marketing lambs for meat purposes. Experiments with hogs involve the cost of production, including rapidity of gain; and comparison of different feeding rations and methods of feeding, including use of pasture.

Bacteriology. Experimental work in Bacteriology is chiefly concerned with soil analyses, with dairy manufacturing, sanitation, and diseases of poultry. Three experimental projects of economic importance that are now under way are the following: (1) The effect of lime and landplaster on the growth of soil bacteria and therefore on the crop; (2) The effect of dryness and varying degrees of soil acidity on the growth of legume bacteria; (3) The facts concerning the prevalence, transmission, and means of control of chicken diseases such as tuberculosis and white diarrhoea.

Botany and Plant Pathology. The work in this department includes the following investigations: Methods of control for grain smuts and their effect on the vitality of the seed; storage decays of potatoes and other vegetables and their prevention; wilt diseases of potatoes and other crops; the control of onion smut and onion mildew; relative efficiency of various fungicides both liquid and dust; control of peach diseases; walnut-blight control; brown-rot prevention; bean diseases; Oregon crop-disease survey; poisonous-plant investigations; weed studies; etc. Special emphasis is now being laid on work of particular importance in connection with the Government's increased food production campaign.

Dairy Husbandry. Experiments in this department are directed to standardizing the color of butter and to determining the amount of coloring matter to be added to cream of a certain test, by sample, in order to bring it to standard color, or "June shade;" to determine the keeping quality as affected by different methods of cream neutralization and pasteurization; to determine the cost of manufacture of different dairy products under commercial conditions; to determine, by testing the different factors in the handling of milk, what are the essentials in reducing the bacterial count of milk for market; to determine the function of the so-called milk veins and their bearing on milk production; to determine the

factors influencing the percentage of fat content in milk; to determine the feeding value of alfalfa meal as a substitute for the usual grain feeds; to determine the value of kale as compared with silage as a succulent feed.

Entomology. Experiments in Entomology include tests to determine the toxicity of various insecticides with three objects in view: (1) To discover new and cheaper insecticides; (2) To discover possible combinations of sprays that will reduce the number of necessary applications; (3) To determine the actual amount of poison necessary to kill a given insect. Experiments also include tests to determine possible means of control for root borers and other root-infesting insect that carry plant diseases; and ecological and life-history studies on orchard plant lice.

Farm Crops. This department has in hand eleven specific experimental projects of chief importance; namely, (1) Variety tests of wheat, oats, barley, flax, vetch, potatoes, and corn; (2) Cultural tests on miscellaneous crops such as sudan grass, sunflowers, mustard, soy beans, and cow peas; (3) Seeding experiments on the time, rate, and date of seeding cereals and legumes; (4) Selection and breeding work with cereals and legumes; (5) Grain and seed storage and handling investigations; (6) Hay handling and storage investigations; (7) Silage making; (8) Grain milling value and milling tests; (9) Crop rotations; (10) Cost of producing crops; (11) Effect of fertilizer on quality of crop.

Farm Management. By means of the farm survey and through farm-record keeping and study of individual cases, a number of the important phases of farm management are being investigated. These are as follows: (a) The determination of the chief factors in successful farming in six different counties of the State, through farm surveys and records; (b) Determination of the cost of production of different crop and live-stock products and the cost of various farm operations, in sixteen counties, through record keeping; (c) Methods, efficiency, and costs in manure handling and preservation, through a survey; (d) Farm organization and management planning on individual farms; (e) Methods and costs of land clearing under different conditions.

Some special study is being given to labor supply and labor efficiency on the farm at this time.

Horticulture. Experiments in Horticulture comprise the following types of investigations: (1) The pollination of the Pomaceous Fruits, including the Gross Morphology of the Apple, Fruit-Bud Development of the Apple; Variation of the Internal Structure of Apple Varieties, etc.; (2) Irrigation work with apples and pears; (3) Experiments with stocks of prunes; (4) Problems of both winter and summer pruning; (5) Strawberry variety tests; (6) Cover-crop investigations; (7) Fertilizer investigations; (8) Breeding investigations with cherries, apples, prunes, and strawberries; (9) Investigations in orchard economics; (10) Vegetable gardening investigations with greenhouse tomatoes, onions, and type selection for canning; (11) Investigations with by-products of fruits and vegetables; (12) Investigations in the relation of depth of planting to mortality of trees; (13) Harvesting and storage investigations with pears.

Poultry Husbandry. Experiments in Poultry Husbandry are chiefly concerned with problems of incubation and with breeding fowls for high average egg production, and for a combination of egg production and meat value. Results in both fields of experimentation have already been remarkable and promise still greater progress toward the objects desired. A new breed, the Oregon, seems to be established with the attributes sought.

Soils. The work in this department includes the following twelve specific investigational projects: Fertility rotations; fertilizer experiments; soil-acidity tests and lime trials; cooperative soil survey; soil correction trials; toxicity of alkali salts to crops; cooperative tillage and soil moisture studies; surveys and feasibility of irrigation and drainage projects; cooperative duty of water and related investigations; experiments in the distribution of water and improvement of irrigation practice; drainage and improvement of wet soils; and evaporation and weather studies in relation to soil production. A comprehensive system of crop rotations and fertilizer trials is being conducted on some fifteen of the chief soils of the State to help develop a permanent system of agriculture. The duty of water and related investigations are conducted cooperatively with the U. S. Department of Agriculture. It is State-wide in scope with agents at Klamath, Redmond, and Burns in Eastern Oregon. The aim is to determine the right amount of water for the chief soil types and leading crops under the main types of farming in the principal irrigated valleys of the State. The surveys to determine the feasibility of proposed drainage or irri-

gation projects are made as demand arises. The experiments in drainage are to determine the most efficient depths and distance apart for placing drains in soils of different types, and for testing the efficiency of bedding drains in straw as compared with soils. Since there are one-half million acres of marsh lands in the State and three million acres of land periodically wet, the value of these investigations is obvious. If efficient drainage added to the value of the land the average determined for this work in the Middle West, the reclamation of the State's wet soils would add at least \$10 an acre to the value of these millions of acres.

Veterinary Medicine. The experimental work of this department has been devoted chiefly to finding means for prevention of sterility in cattle, and to studying the so-called walking disease of horses.

EXTENSION SERVICE

ORLO DORR CENTER, Director

The Extension Service is one of the three great means of expression of the Oregon Agricultural College, whose functions are, resident instruction, experiment and research, and college extension.

The Extension Service is charged with the duty of extending the benefits, advantages, and available information of the College and of the United States Department of Agriculture to every portion of the State and to all those persons who for any reason are unable to come to the College.

The Extension Service includes all forms of off-campus instruction and assistance in those subjects in the College curriculum which lend themselves to extension methods or which can be taken and adapted to the direct needs of the people of the State. The various Extension activities are the means through which information, instruction, assistance, and methods of self-help are carried to all persons, who desire them, at any point within the State. In brief, the Extension Service represents the medium, both independently and in hearty, sympathetic, cooperation with all other organized forces of betterment, for promoting, enlarging, and enriching the agricultural, farm, and home interests of Oregon. No county, town, hamlet, farm, or home need be without some evidence of this helpful service.

To accomplish the objects sought, various methods are employed; namely: Teaching by demonstration, giving of accurate and timely information, organization, planning for social and other recreation, and cooperating with Experiment Station and other organized forces. In a field so large, with such a multiplicity of problems and conditions, and with numerous methods of action, there is grave danger of unwise or wasteful undertakings. To prevent this the law requires the preparation of written plans for work and proposed expenditure of funds. These plans must be approved by the U. S. Secretary of Agriculture and by the President of the Oregon Agricultural College. These detailed plans of work are called projects. They must be approved before they are inaugurated, must be reported on at the close of each fiscal year, and when once adopted and signed cannot be altered or deviated from without the written consent of the authorities of the U. S. Department of Agriculture.

The several distinct lines of work now covered by written projects, from which the citizens of some portion of the State are receiving benefit, include: (1) General Administration and Organization of Extension Service, which also embraces a sub-project, Printing and distribution of Publications; (2) County Agricultural Agents; (3) Home Economics and Emergency Home Demonstration Agents; (4) Boys' and Girls' Clubs; (5) Field Horticulture; (6) Field Dairying and Assistance in Dairy Organization; (7) Farm Management Demonstrations; (8) Field Entomology, Plant Pathology, Bacteriology, and Chemistry; (9) Rural Organization and Marketing; (10) Animal Husbandry; (11) Poultry Husbandry; (12) Farm Crops, Drainage and Irrigation; (13) Farm Labor; (14) Extension Schools, Farmers' and Home-Makers' Week and Meetings, Correspondence Courses, Officiating and Judging at Fairs; (15) Engineering Extension; (16) A General Press Bureau and (17) Personal Information and Advisory Correspondence.

It should not be assumed that these projects cover the only problems of importance within the State. It is the purpose to put into operation and to emphasize those lines of Extension Service that are fundamental to large and important interests of farm or home welfare, or to material agricultural development. It is clearly impossible to give complete and full courses in these lines of work but much that is directly practical, usable, and valuable is available through the Extension Service.

SUMMARY

	Number	Number people reached through this Service in one year.
Lecture Work (one lecture to two-day engagements arranged by requests from communities)	649	58,357
Club Work (lecture engagements)	481	44,393
Demonstrations by Specialists	543	30,297
Farmers' and Home-Makers' Week.....	1	1,283
Demonstration Train	1	3,220
Movable Schools (three- to five-day engagements)	16	11,155
Fair (Exhibitions and Judging)	44	35,040
Conferences	1,579	7,632
Farms visited for personal advisory work	1,498	3,756
Letters written	33,397	33,397
Press Articles prepared	1,106	*221,200
Correspondence courses	19	23
Publications:		
New bulletins	12	
Number pages	194	
Number issued	110,500	*221,000
Reprints	9	
Number pages	55	
Number issued	29,000	*58,000
Barn and silo blueprints	2	37
Miles traveled:		
By rail	146,028	
Otherwise	32,172	
Total number people reached:		
Directly		228,590
* Indirectly		*500,200

Importance of Extension Work in Oregon. The magnitude of the problem of College Extension in Oregon can be fully realized only by keeping in mind that the State has a population of nearly 800,000 distributed over a total area of 95,600 square miles—a territory greater than the combined areas of Illinois and Indiana and almost as great as the combined areas of New York, New Jersey, and Pennsylvania. The State, moreover, has few railroads, and in certain sections is very sparsely settled. The people who are to be reached by extension methods represent the greatest extreme in age, capacity, education, and experience with the climate and the country. Oregon's great diversity in elevation, precipitation, temperature, soil, and climatic conditions, still further complicates the problem of Extension Service, and makes it important in proportion to its complexity.

All persons or communities in the State wishing to make use of the assistance to which they are entitled and which will gladly be given in any of the lines indicated, should communicate with the county representative of the Extension Service (County Agent, Home Demonstration Agent, or County School Superintendent)

direct, or with the Extension Service, Oregon Agricultural College, Corvallis, Oregon, as far as possible in advance of the time the appointment is desired. Short-notice requests may not find the College in position to render the service desired. If an Extension School is desired, be sure to give all particulars pertaining to the time, the nature of the subjects in which the community will be interested, the number of speakers desired, and the plans for the meeting. If a single lecture or demonstration or exhibit is wanted, be equally prompt and explicit.

It must be remembered that while the College is anxious and willing at all times to help all who apply, its staff, facilities, and funds are limited. On this account, the Extension Service is sometimes unable to give aid where it would like most to give it. Requests for instruction or other assistance, however, should not be withheld. The great majority of the State's needs have been, and generally can be, cheerfully and efficiently met.

ADMINISTRATIVE

ORLO DORR CENTER, Director
HAZZLITT VICKERS, Assistant to Director
MARGARET FARQUHAR COOK, Secretary

The administrative work of the Extension Service is vested in a Director and heads of the various departments. The administrative duties consist of planning and coordinating the several lines of Extension work, dividing and assigning funds, planning the Extension campaigns, meetings, schools, conferences, demonstrations, etc., authorizing all Extension publications, planning and arranging exhibits, and supervising the prosecution of all phases of the work. Reports are required covering all lines of Extension Service and periodical reports are made to College officials and other cooperating agencies.

COUNTY AGENT WORK

PAUL VESTAL MARIS, State Leader
WALLACE LA DUE KADDERLY, Assistant State Leader

The largest branch of the Extension Service at the present time is the County Agent work. In charge of this division is the State Leader and Assistant State Leader. Prosecuting the work throughout the State are 26 County Agents, covering 27 counties, each agent being charged with the development of the agricultural interests of the county over which he has jurisdiction.

The work is conducted under the authorization of Section 3 of Chapter 10 of the Session Laws of Oregon for 1913. Counties with areas of less than 5000 square miles may appropriate up to \$2000 for the employment of an agent and maintenance of his office and larger counties may appropriate up to twice that amount. The State duplicates the county appropriation and in addition to the county and State money there is also available the county's proportionate share of such federal funds as are allotted to the State of Oregon for this purpose. Since the war the allotments have been increased until it is hoped that each county will receive approximately \$1000 of federal money during the year 1918. The average county appropriation is approximately \$1700. The provisions of the Oregon law place the County Agent work under the direct supervision of the Agricultural College.

Counties not provided with county agents and interested in securing them should correspond directly with the Director of Extension Service or the State Leader of County Agents, who will render every assistance possible in explaining the plan and methods of work and necessary steps to be taken in establishing it.

The Work of the County Agent. The first duty of the County Agent is to build up an organization through which his work may be carried on effectively. In doing this the cooperation of the Granges, Farmers' Unions, and established organizations, is solicited; and what are known as County Agricultural Councils, made up of representatives from these various organizations are instituted. As these organizations are now conceived, they will assist with other Extension activities in the county, such as Home Demonstration work and Boys' and Girls' Club Work. A section of the Council known as the Agricultural Committee will assist the County Agent in preparing a program designed to meet the principal agricultural problems of the county. This program may include the formation of marketing organizations, such as cattle shippers' associations, potato growers' associations, etc., or the organization of drainage districts, conducting practical farm demonstrations pertaining to the management of soils, crops, live stock, and orchards, or the control of insect pests and contagious animal diseases.

The County Agent, in short, establishes a center of local agricultural interests. He maintains a central office in which is assembled information pertaining to the agriculture of the com-

munity. He is the representative of the United States Department of Agriculture, the State Agricultural College and the county in which he is located, and through the union of these forces he is able to apply the fullest measure of practical and scientific knowledge to the solution of the problem and the improvement of the country-life conditions. Similar sections of the Council assist the Home Demonstration Agent and the Club Representatives in their respective lines of work.

So important has the work of the County Agent become that the Government is making every effort to extend the organization to every agricultural county in the United States as a war measure.

HOME ECONOMICS

ANNA MAE TURLEY, State Leader of Home Economics Extension and
Emergency Home Demonstration Agents.
JESSIE DUNLAVY McCOMB, Assistant State Leader Emergency Home
Demonstration Agents.

Home Economics Extension offers a means by which the homemakers of the State may call upon the College for assistance in solving their special problems. This work is planned, first, to meet the demand of Oregon women who are interested in all subjects related to the home and better living conditions; and second, to create a greater interest in these subjects concerning the vital problems, three of which are:

1. Food—selection, preparation, and use.
2. House—arrangement, decoration, and conveniences.
3. Clothing—methods of removing stains, simple tests for wool, cotton, linen, and silks, selection, preparation, and use.

On August 16, 1917, seven Emergency Home Demonstration Agents were appointed in Oregon and assigned to their respective territories, covering in all eighteen counties. The Agents' principal problem at the beginning has been the organization of the people for wide-reaching and effective community campaigns in meeting the requirements of the Nation in the food crisis.

Campaigns are conducted along various lines of home economics in conformity with the request of the Food Administrator including War Emergency Food Surveys, Dietary Studies, Hoover Pledge Card Campaigns, Household Conservation and Thrift Lessons, Food Preservation Campaigns, and Demonstration of substitutes.

BOYS' AND GIRLS' CLUB WORK

HARRY CASE SEYMOUR, State Leader
HELEN JULIA COWGILL, Assistant State Leader
LEONARD JOHN ALLEN, Assistant State Leader Pig Club Work
ALPHONSUS O'REILLY, Assistant State Leader
ALICE JOYCE, Assistant State Leader
PHILLIP TUTHILL FORTNER, Assistant State Leader, Pig Club Work
Other State and County part time Assistants

The Junior Extension activities of the Oregon Agricultural College take the form of club and contest work among the boys and girls. Those who are, or can be, interested in the basic farm and home enterprises, such as the growing of plants, the rearing of animals, or the work in home economics, are encouraged to enroll for one or more Club projects.

The Club project, which is to be worked out at home, may take the form of growing one-sixteenth of an acre or more of corn, potatoes, vegetables, etc.; the management of a brood sow and litter, or a single pig; sheep raising; raising a flock of chickens; keeping a milk and feed record on a herd of dairy cows; the completion of ten lessons in sewing, baking, food preparation, or canning—14 different projects in all.

Assistance is rendered, enthusiasm aroused, and interest sustained in the work by means of Club meetings, circulars and bulletins, and personal visitation by local, county, and State Club leaders.

Prizes are offered to the winners in Club projects at the local, county, and State Club festivals and fairs. The Club members are made to see, however, that the most worth-while prizes are the knowledge, skill, and profit that each one may derive from the work.

Club work in Oregon is maintained and supervised by the Oregon Agricultural College Extension Service in cooperation with the U. S. Department of Agriculture, and the State Department of Education. The activities of all these agencies are focalized in a State Leader of Club work, who is a member of the Extension Service staff, and to whom all inquiries regarding Club work should be addressed.

HORTICULTURE

WALTER SHELDON BROWN, Extension Specialist in Horticulture.

Extension Horticulture covers the whole subject of orchard operations, including cultivation, pruning, spraying, thinning, harvesting, and marketing, laying special emphasis upon the vital question of reducing the cost of producing and handling fruits.

Small fruits and vegetables will have their share of attention and the improvement of the surroundings of our farm homes will be emphasized as a matter of great importance.

Improvement in the quality of the exhibits of county and community fairs, better arrangements of such exhibits, and a clearer and more uniform method of classification of exhibits is a subject that will be given considerable attention.

Special emphasis will be laid upon two series of projects or farm schools—one for pruning and one for spraying. This work contemplates having the operations of pruning and spraying, under field conditions, performed by members of the classes enrolled under the direction of the Extension Horticulturist.

DAIRYING

EDWARD BLODGETT FITTS, Extension Specialist in Dairy Husbandry
EDGAR LEROY WESTOVER, Dairy Husbandman

Extension Dairying carries throughout the State, and helps to put into effective use, information regarding all branches of the dairy industry, such as the care and management of the herd, the raising of the calf, the construction of buildings, the breeding and feeding of cattle, the treatment of diseases, the care of milk and cream, and the manufacture of dairy products. Special emphasis and aid is given toward effecting dairy cooperative organizations such as Cow Testing Associations, Breeders' Associations, Bull Associations, Farmers' Cooperative Creameries, Farmers' Cooperative Cheese Factories, and Farmers' Cooperative Cream Selling Agencies.

FARM MANAGEMENT DEMONSTRATIONS

(Farm Management Demonstrator to be appointed.)

The purpose of the department of Farm Management Demonstrations is to demonstrate to farmers, in connection with their own farms, a practical and efficient method of summarizing and

analyzing a farm business as a means of measuring the profit or loss incurred in conducting it and of deciding upon readjustments that promise to increase its net income.

In a management demonstration the business of each farm in a community is analyzed from an economic standpoint and then compared with the others to determine some of the changes which should be made in its organization to make it more profitable.

The Federal Income Tax makes necessary a more careful study of farm accounts and keeping of more accurate records. Special attention will be given to meet this requirement through the farm record work and farm business analysis.

FIELD ENTOMOLOGY, PLANT PATHOLOGY, BACTERIOLOGY, CHEMISTRY, ZOOLOGY, ETC.

(Specialists from these College Departments.)

The Extension Service in the several sciences covered includes personal conferences and information, lectures, demonstrations, correspondence, and reports.

In entomology particular attention is given to the control of orchard and garden insect pests, field-crop pests, stored-product insects, and to apiculture. Onion smut problems, cereal smut, its control and prevention, grain rusts, and general disease identification, control and eradication of all classes of poisonous plants is given consideration by the plant pathologists. Special cooperation and assistance is rendered through the department of Bacteriology in the preparation and distribution of legume bacteria, through control of serious contagious disease both human and animal and in conjunction with State departments in determining milk supply contamination and control.

The other departments render similar service along their particular lines.

ORGANIZATION AND MARKETS

HECTOR MACPHERSON, Extension Specialist in Organization and Markets.
FRANK LLEWELLYN BALLARD, Field Organizer.

The Extension Service Bureau of Organization and Markets takes up the investigation and marketing problems which are confronting the farmers of the State. One man is in the field constantly, working with the farmers who are attempting, through

organization, to better their conditions. Other members of the staff are sent out on definite organization projects, such as creamery and cheese factory organizations. It is the aim of this department to help farmers organizations to get started in such a way as to accomplish the most good with the least possible risk and outlay.

Systematic instruction is being carried on through extension lectures, press bulletins, and personal conference covering the whole field of marketing and rural credits.

ANIMAL HUSBANDRY

(Animal Husbandman to be appointed.)

Extension Animal Husbandry takes up all problems connected with the improvement of beef cattle, horses, swine, sheep, and goats. The slogan is "Better breeding and more efficient feeding." Information is gathered from many sources and distributed throughout the State. The Extension work in animal husbandry is being much strengthened through the rapid accumulation of valuable live-stock data by the Experiment Station at Corvallis and by the Eastern Oregon Branch Experiment Station at Union. The great diversity of conditions in various parts of the State is given due consideration and the work planned to fit the particular locality where given.

POULTRY HUSBANDRY

*CHARLES STOCKTON BREWSTER, Extension Specialist
in Poultry Husbandry.

Extension Poultry Husbandry covers all the branches of the poultry industry in a practical way as they apply to actual farm conditions in the State.

The work embraces such subjects as breeds and methods of breeding; feeds and methods of feeding; methods of housing and management of fowls for egg production and for market; hatching and rearing chickens; marketing of poultry and eggs. Particular emphasis will be laid upon the breeding of fowls for egg production.

Through cooperation with County Agents an effort will be made to hold special demonstrations in caponizing and in selecting and culling laying hens.

The general aim is to help the poultry raisers to produce better eggs and more of them at less cost.

* Devotes one-half time to Resident Instructional work.

FARM CROPS

(Field Specialist in Farm Crops to be appointed.)

Farm-crops Extension work covers the bulk handling of grain, the grading and classification of grain, potatoes, hay, etc., the selection of land for cropping purposes, the preparation of soil, seed selection, planting, culture, harvest, and storage methods for grain, potatoes, beans, peas, corn, flax, and other crops and forage plants, as well as potato certification, seed inspection, crop rotation, and special crop problems. This service is given through personal advisory conferences, special demonstration, lectures, institutes, bulletin, correspondence, and extension schools.

DRAINAGE AND IRRIGATION

*WILBUR LOUIS POWERS, Extension Specialist in Drainage and Irrigation.

Drainage includes the soil management subsequent to installing drains as well as drainage construction work. Assistance is given in planning drainage systems as well as through personal demonstrations in the laying out of drainage systems for individuals and communities. Information is given through lectures, extension schools, personal conference, and correspondence. Assistance and advice is also given in the organization of feasible drainage districts.

Irrigation includes the economic use of water, handling of soils and crops under irrigation, removal of alkali by drainage, and like matters. Assistance is rendered in this work as outlined above under drainage. Design of farm distribution systems and individual pumping plants and organization of irrigation districts where feasible are among the activities of this division.

FARM LABOR

JOHN WILLIAM BREWER, Farm Labor Specialist

The Farm Labor Specialist determines labor shortage and assists in supplying this shortage as far as may be possible. Cooperative agencies in this work are the U. S. Department of Agriculture, State Labor Commissioner, County Agricultural Councils, County Agents, County Councils of Defense, Portland Municipal Employment Bureau, and such other forces as are concerned in this field

* Part time instructional work at College.

of work. This Extension Specialist is a direct representative of the U. S. Department of Agriculture in Oregon and is in charge of all farm labor surveys, farm labor problems, and related matters. He is a member of the Extension Service through cooperative project agreement. The Farm Labor Specialist is directing the efforts of the U. S. Boys' Working Reserve in the State.

EXTENSION SCHOOLS, LECTURES, AND CORRESPONDENCE COURSES

HAZZLITT VICKERS, Assistant to Director

Extension Schools. Extension Schools along definite project lines are organized in various sections of the State. These schools are arranged in such way that they may continue from year to year at the same points and yet not repeat the work previously given. The length of time spent at each place is dependent upon the subject matter to be handled in each case.

Extension Lectures. Lectures will be furnished local organizations upon request through County Agents and Home Demonstration Agents in territory occupied by these agents, or direct through the Extension Service in case there is no agent in the territory. In all lecture work it is desirable both as regards economy and efficiency to arrange the work in circuits.

While it is impossible to give a complete list of the courses and subjects offered through Extension Schools and Extension Lectures, an attempt will be made to furnish instruction in all lines of agriculture, home economics, commerce, engineering, and forestry, and such other lines of work as come within the curriculum of the Oregon Agricultural College which can be effectively taught without resident instruction requirements.

Fair Judging and Exhibits. Judges will be furnished fairs as far as this is possible with the limited staff available. Exhibits will also be made at a few large fairs.

All the work outlined above is arranged directly through County Agricultural Agents, Home Demonstration Agents, and other representatives of the Extension Service in the territory from which requests are received. Requests may be sent either to the Agents or to the Extension Service, Oregon Agricultural College, Corvallis, Oregon.

Correspondence Courses. The aim of the Extension Service of the Oregon Agricultural College in offering correspondence courses is to reach those who cannot be reached otherwise, but who are seeking special information along such lines of work as can be taught through correspondence. Courses are offered only in such subjects as will prove of practical benefit to those who are interested in the special subject taken up.

It is assumed in the courses offered that the student has only a general acquaintance with the subject pursued and that he desires a practical working knowledge of it. Subjects, therefore, will be presented in simple and direct language.

The following courses are offered:

- | | |
|---|---|
| 1. Farm Accounting. | 10. Accounting. |
| 2. Rural Law. | 11. Farm Arithmetic. |
| 3. Rural Economics. | 12. Gas Engines. |
| 4. Advertising and Selling. | 13. Concrete Construction on the Farm. |
| 5. Cooperative Accounting and Management. | 14. Shop Arithmetic. |
| 6. Business Organization and Management. | 15. Shop Drawing. |
| 7. Business Management for Women. | 16. Electricity and Magnetism. |
| 8. Business Law. | 17. Heat and Its Mechanical Transformation. |
| 9. Bookkeeping. | 18. Farm Irrigation Practices. |
| | 19. Farm Drainage. |

Additional courses in other subjects will be added from time to time as demands are made for them. Students may begin correspondence courses at any time during the year. No preliminary examination is required for enrollment.

Students desiring to enroll in any courses offered, should write to the Extension Service, Oregon Agricultural College, Corvallis, Oregon, for the special circular on Correspondence Courses.

ENGINEERING

(Specialists from the Faculty of the School of Engineering.)

Technical courses in engineering are given in Portland both to professional and operating engineers. Such courses include the measurement of water, pipe lines, and protective devices, types and uses of pumping equipment, the design of power and pumping plants, electricity and electrical engineering, steam and gas engineering, refrigeration, thermo-chemistry, thermics, engineering and design of power plants, engineering finance and cost analysis, and engineering mathematics.

Extension Highway Engineering offers its assistance to the county courts, road officials, and citizens of the State generally in attaining a higher standard in road construction and maintenance.

Lectures and demonstrations are given before meetings of county road officials and citizens' organizations on construction and maintenance of all the ordinary types of roads in common use, including consideration of drainage, alignment, and approved methods of construction.

Personal examinations, laboratory tests, and reports on road building materials are also features of the work done.

PRESS SERVICE

CHARLES JARVIS McINTOSH, Editor Press Bulletins

The Extension press service assists in getting the valuable information developed by the research specialist out to the farms, factories, offices, homes, and schools where it is most needed. The monthly "Extension News" containing seasonal information in popular language is sent to the entire Extension mailing list consisting of some 20,000 names and to all newspapers and other periodicals of Oregon; also to a select list of about four hundred publications in the Northwest and other parts of North America. This information reminds farmers and other operators of the need of certain practice, and instructs them in the best methods of applying it. The department sends stenciled stories to all the dailies of the State once a week, a College news letter weekly to many of the leading metropolitan dailies of the United States, many specials to the newspapers in Portland as well as other places in the State, and comprehensive articles of technical nature to hundreds of class publications. The department also supervises student special correspondence. Special announcements of field work are furnished newspapers of the communities visited by field specialists.

ROSTER OF OFFICERS

Military Department, 1917-18.

COMMANDANT OF CADETS

Captain THOMAS FRANCIS MAGINNIS, U. S. Army, Retired.

ASSISTANT COMMANDANTS OF CADETS

Captain DENIS HAYES, A. G. N. A., on leave.

First Lieutenant CYRUS F. DUGGAR, A. G. N. A., on leave.

CADET OFFICERS

C. A. McCOLLUM, Colonel.

A. H. AMIS, Lieutenant Colonel.

T. P. CRAMER, Major, First Battalion.

C. A. THOMPSON, Major, Second Battalion.

L. W. COLEMAN, Major, Third Battalion.

H. W. COOPER, Major, Second Battalion.

C. L. FIRESTONE, Major, First Battalion.

STAFF

V. L. PLUE, Regimental Adjutant.

E. W. McMINDES, Regimental Adjutant.

E. W. DYE, Inspection.

ERIC ENGLUND, Inspection.

C. S. NESBITT, Inspection.

W. J. KOCKEN, Bayonet Instruction.

W. A. RUNYAN, Engineering.

H. E. CURREY, Hospital.

S. H. MYERS, Signal Corps.

C. L. PAINE, Supply.

CAPTAINS

L. T. Chellis, Co. "G"

R. O. Coleman, Co. "K"

G. L. Corey, Co. "M"

F. A. Gilfillan, Co. "D"

L. R. Guthrie, Co. "L"

L. Happold, Cos. "I" and "L"

A. O. Meier, Co. "A"

L. B. Moore, Co. "H"

T. J. Porter, Co. "D"

D. W. Ritchie, Co. "E"

A. J. Schoth, Co. "E"

R. Selph, Co. "F"

W. R. Stow, Cos. "D" and "L"

A. J. Woodcock, Co. "B"

FIRST LIEUTENANTS

C. F. Beatie, Adj., First Bat'l'n.	M. O. Kurtz, Adj., Third Bat'l'n.
G. W. Carpenter, Co. "C"	D. F. McEwen, Co. "H"
W. S. Carpenter, Co. "K"	H. B. Morris, Signal Corps
E. H. Chapman, Adj., Sec. Bat'l'n.	M. Newman, Athletics
L. K. Couch, Co. "F"	D. N. Nordling, Co. "G"
H. W. Ferguson, Co. "L"	A. Ostrander, Adj., First Bat'l'n.
H. D. Ford, Hospital	L. H. Paine, Co. "I"
N. K. Ford, Co. "M," Eng.	R. F. Shaw, Adj., First Bat'l'n.
A. C. Jetley, Co. "H"	L. M. Stark, Headquarters
W. Johnson, Co. "G"	O. L. Straughn, Co. "L"
L. B. Kiddle, Cos. "E" and "M"	R. K. Wilmot, Engineering

SECOND LIEUTENANTS

C. L. Atwood, Supply	J. D. Moberg, Co. "L"
C. L. Corum, Co. "M," Inspection	A. W. Oliver, Co. "F"
R. E. Jones, Co. "M"	B. G. Thompson, Co. "D"
E. F. McCormack, Co. "K"	H. W. Thoms, Co. "K"
W. L. McGeorge, Co. "B"	J. M. Underwood, Co. "I"
C. W. Meyers, Co. "C"	

CATALOGUE OF STUDENTS

(The following abbreviations are used to indicate the course in which the student is registered and the classification within the course: Agri., Agriculture; C. E., Civil Engineering; Com., Commerce; H. E., Home Economics; E. E., Electrical Engineering; For., Forestry; L. E., Logging Engineering; Hi. E., Highway Engineering; I. E., Irrigation Engineering; I. A., Industrial Arts; M. A., Mechanic Arts; M. E., Mechanical Engineering; Min., Mining Engineering; Phar., Pharmacy; Fr., Freshman; Soph., Sophomore; Jr., Junior; Sr., Senior; Voc., Vocational; Opt., Optional; Spec., Special.)

GRADUATE STUDENTS

Name	Course	Home Address
Adams, M. Etta..... (Oregon Agricultural College)	H. E.....	Corvallis
Anderson, J. Norma..... (Oregon Agricultural College)	Agri.....	Portland
Bell, James Carscallan..... (Montana State College)	Agri.....	Kendall, Mont.
Black, A Burr..... (Oregon Agricultural College)	Agri.....	Corvallis
Bregger, John Taylor..... (Michigan Agricultural College)	Agri.....	Bangor, Mich.
Buckman, Lewis Taylor..... (Massachusetts Agricultural College)	Agri.....	Wilkes Barre, Pa.
Chandler, Edith Eleanor..... (Wellesly College)	H. E.....	Kenilworth, Ill.
Chang, Clifton Tse..... (Cornell University)	Agri.....	Tientsin, China
Gilfillan, Francois Arch..... (Oregon Agricultural College)	Phar.....	Delmar
Gorrie, Agnes Beals..... (Oregon Agricultural College)	H. E.....	Corvallis
Hawkins, Leon Abbott..... (New Hampshire College)	Agri.....	Plymouth, N. H.
Hooper, John Amos..... (Oregon Agricultural College)	E. E.....	Amboy, Wash.
Hursh, Charles Raymond..... (University of Missouri)	Agri.....	Jonesboro, Ill.
Maris, Homer W..... (University of Oregon)	Agri.....	Portland
Miller, Fred W..... (Ohio State University)	Agri.....	Corvallis
Parpala, Taimie Armas..... (Oregon Agricultural College)	Agri.....	Nasal, Wash.
Pitman, John E..... (Oregon Agricultural College)	Agri.....	Fairmont, Calif.
Porter, Ted John..... (Oregon Agricultural College)	Agri.....	Halsey
Singh, Mahadoe..... (Oregon Agricultural College)	Agri.....	Ondh, India
Soo, Taki Herbert..... (Oregon Agricultural College)	Agri.....	Portland

UNDERGRADUATE STUDENTS

Name	Course	Rank	Home Address
Abbott, Christine Gordon.....	H. E.	Jr.....	Caldwell, Idaho
Abbott, Gurnsey Harlan.....	Agri.	Soph.....	Parma, Idaho
Abegg, Fred Anton.....	Agri.	Soph.....	Portland
Abraham, Julia Dorothea.....	H. E.	Fr.....	Roseburg
Absher, Albert.....	Agri.	Soph.....	Mt. Grove, Mo.
Acheson, Myrtle Evangeline.....	H. E.	Fr.....	Chehalis, Wash.
Adams, Floyd Nelson.....	Agri.	Soph.....	Hardman
Adkison, Russell Sage.....	Agri.	Fr.....	El Toro, Calif
Aeils, Margaret Katherine.....	Com.	Fr.....	Dayton, Wash.
Agee, Leta Violet.....	H. E.	Fr.....	Pendleton
Agosti, Alfred P.....	Hi. E.	Jr.....	Portland
Ahlson, Alete.....	H. E.	Fr.....	Hillsdale
Ahlson, Charles Boone.....	Agri.	Jr.....	Hillsdale
Alcorn, Dale S.....	Agri.	Fr.....	Corvallis
Alderman, Clifford.....	Min.	Jr.....	McMinnville
Alderman, Margaret.....	H. E.	Voc.....	Dayton
Aldrich, Roy.....	Min.	Fr.....	Tacoma, Wash.
Alexander, Constance.....	Phar.	Soph.....	Portland
Alexander, Ethel Marjorie.....	H. E.	Soph.....	Salem
Alexander, George Maxfield.....	Agri.	Jr.....	Salem
Alexander, Harry James.....	Agri.	Soph.....	Chehalis, Wash.
Alicante, Marcos M.....	Agri.	Soph.....	Philippine Islands
Allen, Davis John.....	Agri.	Voc.....	Corvallis
Allen, Ella Lorene.....	H. E.	Fr.....	Lostine
Allen, Sam S.....	For.	Voc.....	Portland
Altstadt, George John.....	For.	Soph.....	Portland
Alter, Hobart R.....	Agri.	Soph.....	Ontario, Calif.
Amis, Albert Hope.....	Agri.	Sr.....	Shandon, Calif.
Anawalt, Clinton La Verne.....	Agri.	Jr.....	Jordan Valley
Anderson, Anna Elaine.....	H. E.	Voc.....	Ilwaco, Wash.
Anderson, Ellen Caroline.....	H. E.	Fr.....	Portland
Anderson, Elmer Edward.....	Agri.	Fr.....	Lake
Anderson, Martin.....	M. E.	Spec.....	Sweden
Anderson, Juliette Norma.....	Agri.	Sr.....	Portland
Anderson, Otto Erwin.....	Agri.	Fr.....	Ilwaco, Wash.
Anderson, Edwin Caldwell.....	Agri.	Jr.....	Corvallis
Andrews, Abby.....	H. E.	Spec.....	Corvallis
Andrews, Kenneth Cutter.....	Com.	Fr.....	Oregon City
Appelman, Ruth Marguerite.....	Com.	Fr.....	Corvallis
Archibald, Raymond.....	Hi. E.	Jr.....	Albany
Ariss, Dorothy Crosfield.....	H. E.	Soph.....	Portland
Armistead, Amy Isabella.....	H. E.	Jr.....	Portland
Armstrong, Fay.....	H. E.	Sr.....	Corvallis
Armstrong, Sam Walter.....	M. E.	Soph.....	Bandon
Arnett, Wilson.....	Com.	Jr.....	Ontario, Calif.
Arnold, Maude Rita.....	H. E.	Spec.....	Centralia, Wash.
Arthur, Ernest Chas.....	Agri.	Fr.....	McMinnville
Ash, Minna Carolyn.....	Com.	Soph.....	La Grande
Aspinwall, Harold McKinley.....	Agri.	Fr.....	Salem

Name	Course	Rank	Home Address
Asplund, Esther Charlotte.....	Com.	Fr.....	Marshfield
Atwood, Alice Lillian.....	H. E.	Soph.....	Corvallis
Atwood, Cyrus Leslie.....	Com.	Sr.....	Corvallis
Averill, Warren Lamson.....	Agri.	Spec.....	Corvallis
Avery, Joseph Conant.....	C. E.	Fr.....	Klamath Falls
Avrit, Roy Calvin.....	E. E.	Fr.....	Corvallis
Axtell, Edith Elizabeth.....	Com.	Spec.....	Corvallis
Axtell, Frances Joy.....	Com.	Spec.....	Corvallis
Babb, Bert Graydon.....	Agri.	Fr.....	Eugene
Bacon, Runa Elizabeth.....	Com.	Jr.....	La Grande
Backman, Emil.....	Agri.	Fr.....	Marshfield
Badger, Raymond Eugene.....	Agri.	Fr.....	Oakland, Calif.
Bagley, Ferris.....	For.	Soph.....	Salem
Bailey, Lawrence Dudley.....	For.	Spec.....	Portland
Bailey, Lester William.....	Agri.	Spec.....	Gladstone
Bailey, Mamie Evelyn.....	Com.	Fr.....	The Dalles
Bailiff, Edith Dorothy.....	Com.	Soph.....	Corvallis
Bain, Walter Marion.....	Chem. E.	Soph.....	Portland
Baker, Charles Eugene.....	Agri.	Soph.....	Los Angeles, Calif.
Baker, Rufus William.....	Agri.	Spec.....	Oregon City
Balbach, John Ray.....	Agri.	Fr.....	Portland
Balderee, Caryl Dorothy.....	Com.	Fr.....	Corvallis
Baldwin, James Daniel.....	Agri.	Sr.....	Blue Lake, Calif.
Ball, Ted M.....	Agri.	Fr.....	Corvallis
Ball, Harold Franklin.....	C. E.	Soph.....	Portland
Bamford, Floyd V.....	Com.	Voc.....	Portland
Banton, Raymond Edward.....	I. A.	Fr.....	Monroe
Barker, Guy Edwin.....	Com.	Soph.....	Cove
Barker, Mary Elizabeth.....	H. E.	Sr.....	Oakland, Calif.
Barnard, Gordon T.....	Agri.	Voc.....	Fossil
Barnes, Richard Lea.....	For.	Fr.....	Portland
Barnett, Harlan Adair.....	For.	Spec.....	Florence
Barnum, Marion Elizabeth.....	Com.	Fr.....	Medford
Barratt, Marjorie Marian.....	H. E.	Jr.....	Portland
Barrows, Orvil Clifford.....	M. A.	Voc.....	Marshfield
Barrows, Ruth Jane.....	H. E.	Fr.....	Marshfield
Bartholomy, Lester John.....	Agri.	Fr.....	Drain
Barton, Bess.....	H. E.	Sr.....	Puyallup, Wash.
Bartu, Frank.....	M. E.	Sr.....	Crabtree
Bates, Douglas Ivan.....	E. E.	Sr.....	Corvallis
Bates, Mabel Gould.....	H. E.	Opt.....	Corvallis
Bayley, Carrie M.....	Com.	Spec.....	Eugene
Beagle, Glenn Elwood.....	Agri.	Soph.....	Holland
Beall, Malcom.....	Agri.	Soph.....	Portland
Beals, Erma Elizabeth.....	H. E.	Soph.....	Corvallis
Beals, Ora Fern.....	Com.	Fr.....	Corvallis
Beatie, Charles Fountain.....	C. E.	Sr.....	Oregon City
Beaty, Leslie.....	Agri.	Spec.....	Walkerton, Ind.
Bechen, Ella.....	Com.	Jr.....	Hillsboro
Beck, John George.....	Min.	Spec.....	Astoria
Beck, J. Ralph.....	Agri.	Jr.....	Corvallis

Name	Course	Rank	Home Address
Becker, Lorette Clare.....	Phar.	Fr.	Corvallis
Beckwith, Naomi Allatt.....	H. E.	Soph.	Salem
Beebe, Sadie Elizabeth.....	Com.	Soph.	Central Point
Beers, Ruby Evangeline.....	H. E.	Sr.	Corvallis
Behnke, Carl Henry.....	Agri.	Jr.	Sunnyside, Wash.
Belfils, Harriette Urso.....	Com.	Fr.	Estacada
Bell, George Foster.....	Agri.	Fr.	Corvallis
Bellinger, Wilbur Moore.....	Agri.	Jr.	Moscow, Idaho
Belt, Walter K.....	Agri.	Soph.	Corvallis
Bendler, Georgine Bertha.....	H. E.	Jr.	Cornelius
Benedick, Arthur Harold.....	M. E.	Fr.	Hermiston
Benner, Robert Lenox.....	Agri.	Spec.	Oakland, Calif.
Bentson, Faye.....	Phar.	Voc.	Silverton
Beougher, Ethel Olive.....	H. E.	Fr.	Crabtree
Berchtold, Florence.....	H. E.	Jr.	Corvallis
Bernard, Noemi Yvonne.....	H. E.	Soph.	The Dalles
Biersdorf, Edgar Alwin.....	Agri.	Fr.	Portland
Billeter, Calvin.....	E. E.	Fr.	Portland
Billeter, Paul Edward.....	Com.	Soph.	Portland
Billingsley, Neve.....	H. E.	Fr.	Ontario
Bingham, Curtis Harry.....	Agri.	Fr.	Alhambra, Calif.
Bissett, Lee Henry.....	Agri.	Sr.	Hebo
Bitney, Dewey Hobson.....	M. E.	Fr.	Woodburn
Bixby, John Snell.....	Agri.	Soph.	Freewater
Black, Emerson P.....	Agri.	Sr.	Corvallis
Black, Ethel G.....		Opt.	Corvallis
Black, Grace Mae.....	Com.	Spec.	Mt. Vernon
Black, Kathleen.....	H. E.	Jr.	Medford
Blair, Erwin W.....	Com.	Fr.	Long Beach, Calif.
Blake, Marjorie Elizabeth.....	H. E.	Soph.	Salem
Boardman, Leo Woodward.....	Agri.	Spec.	Chicago, Ill.
Bock, Fred Neale.....	M. E.	Spec.	Condon
Bobzien, Helen Carolyn.....	H. E.	Fr.	Grants Pass
Bodine, Roger C.....	For.	Jr.	Pasadena, Calif.
Bodle, Orval.....	E. E.	Soph.	Bay City
Bodner, Michael James.....	E. E.	Fr.	Raynesford, Mont.
Boehmer, Karl C.....	For.	Soph.	Portland
Boetticher, Marion Louis.....	Chem. E.	Fr.	Albany
Bogard, Troy.....	Agri.	Sr.	Woodburn
Boge, Charles.....	Min.	Fr.	Cornelius
Bolin, Frank Gerald.....	Agri.	Sr.	Portland
Bollen, Walter Beno.....	Agri.	Soph.	Portland
Bolton, Dorothy Townsend.....	H. E.	Fr.	Pasadena, Calif.
Bolton, Genevieve.....	H. E.	Jr.	Seattle, Wash.
Bond, Mona.....	Phar.	Soph.	Halsey
Bonner, George.....	Agri.	Jr.	Brighton, England
Boord, Opal Irene.....	H. E.	Fr.	Corvallis
Bouquet, Grace.....	Opt.		Corvallis
Bower, Hazel Harriet.....	Opt.		Corvallis
Boyakin, Joseph S.....	E. E.	Fr.	Nehalem
Boyce, Ruth Esther.....	Com.	Fr.	John Day

Name	Course	Rank	Home Address
Brach, August Theo.....	Agri.	Soph.	Astoria
Bracher, Karl Fredric.....	For.	Soph.	Portland
Bradley, Pearl R.....	H. E.	Soph.	Woonsocket, S. D.
Branstetter, Myrtle Esther.....	Phar.	Spec.	Echo
Braun, Elsie M.....	H. E.	Soph.	Portland
Breese, Roy Arthur.....	Agri.	Soph.	Red Bluffs, Calif.
Breithaupt, Alva.....	Agri.	Jr.	Portland
Breennan, Andrew F.....	For.	Jr.	Boise, Ida.
Brewer, Ruth Hannah.....	H. E.	Soph.	Chemawa
Brinkerhoff, Ethel Anita.....	H. E.	Sr.	Piedmont, Calif.
Briscoe, Gladys Fern.....	Com.	Fr.	Weiser, Idaho
Brittan, Joe M.....	Agri.	Soph.	Cornig, Iowa
Brook, Erma Millicent.....	H. E.	Spec.	Portland
Brown, Clara Janet.....	Opt.		Corvallis
Brown, Frank Kimball.....	Agri.	Soph.	Salem
Brown, Frances Roberta.....	H. E.	Soph.	Haines
Brown, Nina Marion.....	H. E.	Soph.	Belfield, N. D.
Brown, Oliver Ellis.....	Com.	Soph.	Philomath
Brown, Ruth Elizabeth.....	H. E.	Soph.	Ithaca, Mich.
Brown, Rowland Seth.....	Com.	Spec.	Philomath
Brown, Shirley Grace.....	H. E.	Fr.	Corvallis
Brown, Veda Alice.....	H. E.	Fr.	New Era
Brugger, Anna Marie.....	H. E.	Fr.	Gresham
Bryan, Elaine.....	H. E.	Soph.	Portland
Bryan, Leon H.....	Agri.	Soph.	Fort Jones, Calif.
Bryant, Theodore L.....	Min.	Fr.	Ladysmith, B. C.
Brye, Irene Anna.....	H. E.	Soph.	Auburn, Calif.
Buchner, Lynn Charles.....	M. E.	Fr.	Ontario
Buchner, Olive Dorothea.....	H. E.	Fr.	Salem
Bullard, Frank Wesley.....	Com.	Fr.	Bullards
Burnap, Walter James.....	Com.	Voc.	Corvallis
Burnap, Florence De Eette.....	H. E.	Soph.	Corvallis
Burris, John H.....	Phar.	Fr.	Salem
Burt, Uriel S.....	Com.	Fr.	Corvallis
Bush, Carl L.....	Agri.	Soph.	Hoskins
Bush, Zetta Zoretta.....	H. E.	Jr.	Hoskins
Bushman, John Harry.....	M. E.	Fr.	Eugene
Butler, Guy H.....	Chem. E.	Fr.	Albany
Butt, Frederick E.....	Agri.	Soph.	Parkplace
Butterfield, George Aubrey.....	E. E.	Fr.	Weiser, Idaho
Buttervich, Vincent Floyd.....	Agri.	Soph.	Fairbanks, Alaska
Byers, Oscar L.....	For.	Sr.	Portland
Cady, Alice Ellen.....	Com.	Fr.	Corvallis
Cairncross, Helen Elizabeth.....	Com.	Fr.	Buhl, Idaho
Caldwell, Harold T.....	M. E.	Soph.	Pomona, Calif.
Cameron, Eckford.....	Com.	Fr.	Gresham
Cameron, James Maurice.....	Agri.	Fr.	Portland
Campbell, Ralph H.....	Agri.	Fr.	Amity
Canfield, Alfred Clarke.....	Agri.	Fr.	Albany
Cantrall, Otto Lamar.....	E. E.	Soph.	Ruch
Carder, Dean Samuel.....	Chem. E.	Fr.	Medford

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Carlberger, Axel.....	Com.	Voc.	Portland
Carlson, Arthur Albert.....	E. E.	Soph.	Portland
Carlson, Howard.....	Com.	Soph.	Butte, Mont.
Carlson, Elsie Elmer.....	Com.	Spec.	Mulino
Carlson, Jennie G.....	H. E.	Fr.	Marshfield
Carlyle, Mildred.....	H. E.	Jr.	Forest Grove
Carnes, Deirdre.....	H. E.	Soph.	North Powder
Carney, William Edward.....	For.	Spec.	Huff, Pa.
Carpenter, George W. C.....	M. E.	Sr.	Washougal, Wash.
Carpenter, Walter Squire.....	Agri.	Sr.	Ashland
Carroll, Richard Eldon.....	Phar.	Soph.	Harrisburg
Carter, Claire Mary.....	H. E.	Jr.	Aberdeen, Wash.
Carter, Harold Samuel.....	C. E.	Soph.	Drain
Carter, Loyd Frank.....	E. E.	Soph.	Portland
Carver, Fay.....	Com.	Soph.	Phoenix
Case, Austin M.....	Chem. E.	Fr.	Klamath Falls
Castner, Frances Lillian.....	H. E.	Fr.	Hood River
Castle, Carrie Ethel.....	H. E.	Sr.	Berkeley, Calif.
Catton, Helen Lois.....	H. E.	Fr.	Portland
Catton, Mildred Wheeler.....	E. E.	Fr.	Portland
Caudle, Earl Cecil.....	Chem. E.	Fr.	Corvallis
Chadbourne, Estelle Wescott.....	H. E.	Jr.	San Francisco, Calif.
Chadbourne, Howard B.....	Agri.	Fr.	San Francisco, Calif.
Chambers, Ralph Leveret Hugh.....	Agri.	Fr.	San Bernardino, Calif.
Chambers, Ruth Anna.....	H. E.	Fr.	Portland
Chandler, Annabel Carolyn.....	Phar.	Spec.	Corvallis
Chandler, Charlie.....	Agri.	Fr.	Fresno, Calif.
Chandler, Loyd Alden.....	M. E.	Fr.	La Grande
Chaney, Juanita Mae.....	H. E.	Fr.	Corvallis
Chapel, Franklin Gage.....	M. E.	Fr.	Portland
Chapman, Earl Hoyting.....	For.	Jr.	Rivera, Calif.
Chapman, Floyd L.....	M. E.	Fr.	Wilbur
Chapman, Margaret L.....	H. E.	Fr.	Sheridan
Chase, Elmo Barry.....	Agri.	Jr.	Eugene
Chase, Marion Lois.....	H. E.	Fr.	Corvallis
Chatfield, Mrs. M. F.....	H. E.	Spec.	Albion, Mich.
Chellis, Lawrence True.....	I. A.	Sr.	Astoria
Chester, Alma Helen.....	Com.	Fr.	Boise, Idaho
Childs, Dorothy Ellen.....	H. E.	Jr.	Corvallis
Chipman, Merlin R.....	Phar.	Soph.	Corvallis
Christine, Gertrude.....	H. E.	Spec.	Kenton
Christensen, Hazel.....	H. E.	Jr.	Portland
Christensen, Henry Noris.....	Agri.	Jr.	Portland
Christiansen, Lulu Marie.....	H. E.	Soph.	Chinook, Mont.
Church, Leighton F.....	E. E.	Soph.	Grizzly Bluff, Calif.
Clark, Doris Aileen.....	H. E.	Sr.	Astoria
Clark, Kenneth Allen.....	Agri.	Fr.	La Grande
Clarke, Roscoe Wheeler.....	C. E.	Fr.	Salem
Clifford, Ida Arvilla.....	H. E.	Fr.	Portland
Clink, Russell T.....	Agri.	Fr.	Modesto, Calif.
Clodfelter, Donald T.....	M. E.	Spec.	Corvallis

Name	Course	Rank	Home Address
Cockrum, Arthur Bishoff	Com.	Fr.	Ontario
Coffman, Rupert Vern	Com.	Fr.	Cottage Grove
Cohill, Victoria	H. E.	Soph.	Portland
Cole, Harry Julius	Com.	Jr.	Emporia, Kan.
Cole, Maple Lucille	H. E.	Soph.	Canby
Coleman, Lloyd W.	Agri.	Sr.	Berkeley, Calif.
Coleman, Margaret Ruth	H. E.	Fr.	Moro
Coleman, Ralph Orval	Agri.	Sr.	Newport
Collins, Bertha Claire	Com.	Fr.	Corvallis
Collins, Burton Thane	Min.	Fr.	Corvallis
Collins, William Orville	M. E.	Fr.	Waterloo
Colpitts, Olive Percis	H. E.	Soph.	Trinidad, Colo.
Cone, Glyde E.	H. E.	Fr.	Corvallis
Conklin, Donald Vernon	Agri.	Soph.	Ontario
Conklin, Jean	Phar.	Fr.	Ontario
Conklin, Philip Arthur	M. E.	Soph.	Cove
Connell, Arthur Wood	Agri.	Jr.	Hillsboro
Cook, Kenneth	Agri.	Fr.	Portland
Cook, Margaret Farquhar	Com.	Spec.	Corvallis
Cooley, Myrtle	H. E.	Fr.	Smith River, Calif.
Cooley, Warren Robert	Phar.	Fr.	Harrisburg
Coop, Orion Virgil	Agri.	Fr.	Estacada
Cooper, Altha Opal	Com.	Jr.	Corvallis
Cooper, Helen E. A.	Opt.		Philadelphia, Pa.
Cooper, Howard Laraway	M. E.	Soph.	Hood River
Cooper, Howard Wesley	E. E.	Sr.	Milwaukie
Covert, Elmo Claire	For.	Fr.	Portland
Coppock, Jessie	Com.	Spec.	Berlin
Cordelle, Howard Albert	E. E.	Soph.	Weiser, Idaho
Corey, Glen L.	E. E.	Sr.	Hood River
Corl, Miriam Elizabeth	H. E.	Soph.	Corvallis
Cornell, Carroll M.	M. E.	Spec.	Grants Pass
Cornog, Emma R.	Opt.		Oakfield, Wis.
Cornwall, Alice Ellen	H. E.	Jr.	Portland
Corrie, John Quincey	Agri.	Soph.	Corvallis
Corthell, Elden Sweet	Agri.	Soph.	Jacksonville
Corum, Curtis Lee	Chem. E.	Sr.	The Dalles
Cory, William M.	Agri.	Jr.	Etna Mills, Calif.
Coshow, Bertha Leone	H. E.	Soph.	Roseburg
Cottom, Kenneth Klock	Agri.	Soph.	Berea, Ohio
Cottingham, William	M. A.	Voc.	Parma, Idaho
Couch, Leo	Agri.	Sr.	Wallowa
Couch, Roy L.	Agri.	Sr.	Corvallis
Counts, Wilda	H. E.	Sr.	Grants Pass
Covell, Margaret	H. E.	Soph.	Corvallis
Covell, Walter	Agri.	Fr.	Corvallis
Cowan, Alvah G.	Agri.	Voc.	Tatoosh Island, Wash.
Cowley, Doris	Com.	Soph.	Central Point
Cox, Stephen	Chem. E.	Fr.	Ontario
Craig, Roland O.	Agri.	Fr.	La Habra, Calif.
Cramer, Floyd Samuel	M. E.	Jr.	Corvallis

Name	Course	Rank	Home Address
Cramer, Rae Leah.....	Com.	Fr.	Corvallis
Cramer, Theo. P.....	Com.	Sr.	Grants Pass
Crandall, Grace Evelyn.....	H. E.	Fr.	Vancouver, Wash.
Crawford, Lillian Louise.....	Com.	Fr.	Nortons
Crawford, Malcom.....	Agri.	Fr.	Fresno, Calif.
Crawford, Vira June.....	Com.	Voc.	Reith
Creel, June.....	H. E.	Sr.	Reno, Nev.
Crittenden, Marjorie.....	H. E.	Jr.	Portland
Cross, Frances Carolyn.....	Com.	Fr.	Oregon City
Cross, Stella Marie.....	H. E.	Jr.	Oregon City
Crout, Mildred.....	H. E.	Sr.	Portland
Crowell, Chester E.....	Min.	Soph.	Takilma
Crow, John William.....	Agri.	Voc.	Pendleton
Culbertson, Elijah Lee.....	Agri.	Voc.	Gravel Ford
Cummings, Herchel M.....	Phar.	Jr.	Melba, Idaho
Cunning, Mamie.....	H. E.	Fr.	Baker
Cunningham, Bessie Alta.....	Com.	Spec.	San Jose, Calif.
Currey, Herschel Eugene.....	Phar.	Spec.	Baker
Curry, Fred Martin.....	Phar.	Sr.	Albany
Curtis, Irene.....	H. E.	Soph.	Salem
Cyrus, William Fletcher.....	Agri.	Spec.	Corvallis
Dadmun, Orin D.....	Hi. E.	Jr.	Independence
Dallas, Earl Wesley.....	Agri.	Soph.	Corvallis
Dallas, Mabel Tableaux.....	H. E.	Soph.	Corvallis
Daniel, Clarence McClellan.....	For.	Jr.	Monmouth
Daniel, Maple.....	Com.	Spec.	Alsea
Daniel, Margaret.....	H. E.	Fr.	Bananza
Daniel, Margaret B.....	Com.	Spec.	Alsea
Daniels, William Chris.....	Agri.	Spec.	Hoquiam, Wash.
Darland, Zetta Ivy.....	H. E.	Spec.	Tulsa, Okla.
Darby, Una.....	H. E.	Jr.	Silverton
Davidson, Argus Harold.....	Agri.	Sr.	Meridian, Idaho
Davis, Bertha Marian.....	H. E.	Soph.	Marshfield
Davis, Lois Grace.....	H. E.	Soph.	Myrtle Creek
Davolt, Bertha Eunice.....	H. E.	Fr.	Kelso, Wash.
Dawson, Esther Elva.....	Opt.		Corvallis
Day, Loetta.....			
Dean, Eunice Pern.....	H. E.	Voc.	Ferndale, Calif.
Deckebach, Fred Carl.....	Chem. E.	Spec.	Salem
De France, Irving Alfred.....	C. E.	Fr.	Corvallis
De Lay, Imo Laura.....	H. E.	Fr.	Portland
Denlinger, Wendell H.....	Chem. E.	Fr.	Maplewood
Denney, Margaret Dearle.....	H. E.	Voc.	Beaverton
Dent, Milton A.....	M. E.	Fr.	Amity
Dentler, John A. E.....	E. E.	Fr.	Portland
Detering, William.....	Min.	Jr.	Portland
Dezendorf, Nelson C.....	Chem. E.	Soph.	Portland
Dick, Bertram Gail.....	M. A.	Voc.	Albee
Dick, Carolyn Frances.....	H. E.	Soph.	Portland
Dillard, Wilma Lucy.....	H. E.	Soph.	Mills City, Mont.
Ding, Albert Poy.....	For.	Soph.	Portland

Name	Course	Rank	Home Address
Ding, Edward Ralph	Agri.	Jr.	Portland
Ding, Frank Gow	E. E.	Jr.	Portland
Dinger, Viola Ruth	H. E.	Fr.	Sublett, Idaho
Dinwiddie, Eula	Com.	Voc.	Corvallis
Dinwiddie, Verne McKinley	Phar.	Spec.	Corvallis
Dixon, Ned E.	Com.	Fr.	Drain
Doak, Olive Melvyna	H. E.	Fr.	McMinnville
Dobell, Lila Grace	Com.	Spec.	Corvallis
Donovan, Christopher Richard	Agri.	Spec.	Dublin, Ireland
Donnell, Merrill Martin	Phar.	Soph.	The Dalles
Doolittle, George Barnett	Min.	Jr.	Corvallis
Dorn, Lois	H. E.	Soph.	Pasadena, Calif.
Dougherty, Helen Frances	H. E.	Sr.	Baker
Douglas, Alfred Earl	Phar.	Jr.	Corvallis
Douglas, Elizabeth Ruth	H. E.	Jr.	Marshfield
Douglas, Olin Eugene	Phar.	Sr.	Corvallis
Downs, Ada Adelaide	H. E.	Fr.	Drain
Draper, Dale D.	Agri.	Fr.	West Linn
Dunn, Burton Wm.	Agri.	Fr.	Kimberly, Idaho
Dunn, Mary Matilda	H. E.	Jr.	Kimberly, Idaho
Dunn, Paul E.	M. E.	Fr.	Ontario
Dunn, Rufus Earl	Agri.	Spec.	Meda
Dunning, Eva M.	H. E.	Jr.	Stanfield
Dunning, Marilla C.	H. E.	Jr.	Stanfield
DuPuy, Fred K.	M. E.	Soph.	Portland
Du Rette, Louisa Merle	H. E.	Fr.	Gervais
Durham, Lee L. M.	Agri.	Soph.	Hemet, Calif.
Dutton, Geo. Lawrence	Com.	Jr.	Concordia, Kan.
Dye, C. Evangeline	H. E.	Jr.	Oregon City
Dye, Everett Willoughby	M. E.	Sr.	Oregon City
Dyskow, Margaret Marjorie	Com.	Spec.	Centralia, Wash.
Dykes, Thelma	H. E.	Soph.	Corvallis
Dyson, Lizzie	H. E.	Sr.	Dahlia, Wash.
Eakin, John B.	Agri.	Jr.	Dallas
Eakins, Jack M.	Agri.	Sr.	South Pasadena, Calif.
East, Gertrude Dorothy	H. E.	Soph.	Salem
Eaton, Frances	H. E.	Jr.	Portland
Eddy, Arthur Abbott	For.	Voc.	Langlois
Edwards, Dorothy Margaret	H. E.	Fr.	Monroe
Edwards, Lewis Herman	Min.	Jr.	Bellfountain
Eikelman, John Albert	Agri.	Soph.	San Bernardino, Calif.
Eilertson, John E.	Log. E.	Soph.	Clatskanie
Eilertson, William T.	Agri.	Soph.	Clatskanie
Eldridge, Elizabeth Adelaide	H. E.	Soph.	Tacoma, Wash.
Elkins, Helen Oaks	Com.	Soph.	Prineville
Ellestad, Melvin Herman	I. A.	Sr.	Central Point
Elliott, Dorcas May	H. E.	Jr.	Vancouver, Wash.
Elmer, Edna Elmira	H. E.	Spec.	Mulino
Elofson, Harry W.	For.	Sr.	Salida, Colo.
Emery, Burdette	Agri.	Soph.	Portland
English, Felix A.	Hi. E.	Soph.	Salem

Name	Course	Rank	Home Address
English, Pennoyer F.....	Agri.	Jr.	Salem
Englund, Eric.....	Agri.	Sr.	Portland
Enter mille, Fred D.....	Agri.	Jr.	Baker
Ericson, Mrs. Lars John.....	H. E.	Jr.	Corvallis
Ericson, Lars John.....	I. A.	Sr.	Corvallis
Eriksen, Norma Elizabeth.....	H. E.	Soph.	Orland, Calif.
Ernst, Daisy Linden.....	H. E.	Fr.	Claremont, Calif.
Everett, Verne Frazier.....	Agri.	Soph.	Portland
Ewell, Aldwyth Elaine.....	H. E.	Soph.	Portland
Eyre, Rowena Pearl.....	H. E.	Spec.	Salem
Famme, Milile Mae.....	H. E.	Fr.	Forest Grove
Fargher, Walter Melchoir.....	Com.	Voc.	Dufur
Farrell, Miller Starr.....	E. E.	Fr.	Portland
Feike, Zelta Fern.....	H. E.	Jr.	Portland
Felker, Maybelle Edna.....	H. E.	Fr.	Portland
Fenner, Reuben Everett.....	Agri.	Sr.	Sumner, Wash.
Ferguson, Homer W.....	M. E.	Sr.	Portland
Ferguson, Natalie.....	H. E.	Fr.	Helix
Finney, Edward Axel.....	Agri.	Fr.	Astoria
Finney, John L.....	Agri.	Sr.	Astoria
Firestone, Chester La Vene.....	Agri.	Sr.	Vancouver, Wash.
Firestone, Norma Ellen.....	H. E.	Fr.	Vancouver, Wash.
Fischer, Ardis Loraine.....	H. E.	Voc.	Corvallis
Fischer, George.....	E. E.	Fr.	Klamath Falls
Fischer, Robert.....	Min.	Fr.	Klamath Falls
Fischer, Bertha Marie.....	H. E.	Jr.	Haines
Fisher, Elmer.....	Min.	Jr.	Orchards, Wash.
Fisher, Glenn E.....	Agri.	Fr.	Haines
Flegal, Kate Susannah.....	H. E.	Jr.	Eugene
Fletcher, Rita Belle.....	H. E.	Soph.	Corvallis
Fluharty, Arthur Lawrence.....	Agri.	Soph.	Clarkston, Wash.
Foell, Harold F.....	Agri.	Soph.	Los Angeles, Calif.
Fogal, Jay Rhubert.....	Agri.	Voc.	Kanorado, Kan.
Foley, James Owen.....	Phar.	Jr.	Corvallis
Foraker, Miriam.....	Opt.		Corvallis
Forbis, Ernest Stuart.....	M. A.	Spec.	Myrtle Creek
Ford, Hugh Pillsbury.....	M. E.	Sr.	Eugene
Ford, Kenneth.....	Agri.	Soph.	Union
Ford, Neal Kelly.....	M. E.	Sr.	Eugene
Forest, Bernice.....	H. E.	Sr.	Eugene
Forrey, Ira Huber.....	Agri.	Soph.	Pasadena, Calif.
Fortner, Philip Tuthill.....	Agri.	Spec.	Chicago, Ill.
Foster, William Harry.....	M. E.	Fr.	Portland
Fox, Charles A.....	M. E.	Fr.	Portland
Fraley, Laurence King.....	For.	Soph.	Portland
Frame, Dana Selby.....	Ag.	Jr.	Talent
Frazier, M. Ethel.....	Com.	Fr.	Salem
Freeland, Eugene Louis.....	Chem. E.	Jr.	Shedds
Freeman, Leonard Jay.....	Agri.	Soph.	Central Point
Freeman, Lola.....	H. E.	Soph.	Central Point
Freeman, Merritt.....	M. A.	Voc.	Sublimity

Name	Course	Rank	Home Address
Freeman, Vernon Neale	Com.	Fr.	Moro
Freydig, Marguerite	Com.	Fr.	Sutherlin
Freyler, Edna May	H. E.	Sr.	Corvallis
Freidenthal, Adolph Louis	Agri.	Jr.	Portland
Fryer, Claude Henry	M. E.	Fr.	Portland
Fudge, Laurence	E. E.	Jr.	Ballston
Fugh, Paul Chen	For.	Jr.	Washington, D. C.
Fulton, Helen Louise	H. E.	Soph.	Corvallis
Funk, Luther Lawrence	C. E.	Fr.	Sheridan
Funk, Vera Magdalene	H. E.	Soph.	Corvallis
Futtrup, Ellen Marie	Com.	Spec.	Vancouver, Wash.
Gabel, Ruth	H. E.	Fr.	Chehalis, Wash.
Gain, Mertie Jane	Com.	Spec.	Birch Run, Mich.
Gaither, James Terrence	Com.	Fr.	Toledo
Garber, Hazel	H. E.	Jr.	Nampa, Idaho
Gardner, Esther Marie	Com.	Fr.	Portland
Gardner, Frances Harth	Com.	Voc.	Portland
Gardner, Helen Corinne	H. E.	Soph.	Portland
Gardner, Mary Frances	Com.	Fr.	Portland
Gardner, Vesta Hazel	H. E.	Jr.	Salem
Garman, J. C.	E. E.	Fr.	Portland
Garnjobst, Laura Florian	Phar.	Fr.	Salem
Garnjobst, Martha Emma	H. E.	Spec.	Salem
Garst, Clyde	Agri.	Fr.	Dayton, Ohio
Garvin, Pearl Ethelyn	Com.	Fr.	Corvallis
Gavin, Nancy	Agri.	Fr.	Portland
Gay, Ruth Leah	Com.	Soph.	Corvallis
George, Howard S.	Com.	Soph.	Lewiston, Idaho
George, Marian Charlotte	Com.	Soph.	Lewiston, Idaho
Gibbons, James Lane	Agri.	Fr.	Corvallis
Gibbs, Roy Harry	I. A.	Soph.	Gresham
Gibson, Elsie M.	H. E.	Jr.	Nyssa
Gibson, Clair John	M. E.	Spec.	Nyssa
Giddings, Paul C.	M. E.	Fr.	Albany
Gilbert, Lovina	H. E.	Fr.	Tacoma, Wash.
Gilfillan, Dorothy Elvan	Com.	Fr.	Albany
Gilfillan, Hobart Ralph	M. E.	Soph.	Albany
Glaser, John	Agri.	Spec.	Lebanon
Gleeson, Fred Kane	Agri.	Voc.	Mitchell, S. D.
Glennon, Fenton James	Com.	Fr.	Portland
Glines, Emma Ione	H. E.	Sr.	Waldport
Glines, Hallie Winifred	H. E.	Sr.	Waldport
Gloman, Joseph S.	Agri.	Jr.	Bellingham, Wash.
Godel, Howard F.	Agri.	Sr.	Portland
Goheen, Mary Euella	Opt.		Sherwood, N. D.
Gordon, Charles A.	Agri.	Fr.	Pendleton
Gould, Lois Helen	Com.	Fr.	Corvallis
Grafton, Jack H.	Agri.	Soph.	Chehalis, Wash.
Granrud, Harold H.	Chem. E.	Fr.	Tacoma, Wash.
Grant, Mildred Harriett	H. E.	Fr.	Portland
Graves, Leaman Lee	Agri.	Sr.	Corvallis

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Gray, Zola Love.....	H. E.	Spec.	Springfield
Gregg, Loyd B.....	Com.	Fr.	Salem
Gregg, Rodney.....	M. E.	Jr.	Gazelle, Calif.
Gregson, Agnes.....	H. E.	Soph.	Salem
Green, Ellsworth Nelson.....	Min.	Soph.	La Verne, Calif.
Green, Katharyn Boyce.....	H. E.	Soph.	Berkeley, Calif.
Green, Marshall Byron.....	Min.	Soph.	La Verne, Calif.
Green, Max.....	I. E.	Fr.	Alturas, Calif.
Greer, Medric M.....	Agri.	Sr.	Dundee
Gribskov, Maren.....	H. E.	Sr.	Junction City
Grimm, Frank Lawrence.....	Opt.		Onalaska, Wash.
Grow, Homer Wallace.....	Agri.	Sr.	Corvallis
Groves, Roshel Meryl.....	Agri.	Soph.	Lebanon
Grubb, Hollis.....	E. E.	Fr.	Halfway
Gruening, Helen Elizabeth.....	Phar.	Fr.	Corvallis
Guest, Lillian V.....	Opt.		Portland
Gunn, Henry Martin.....	Agri.	Soph.	Hermiston
Gurley, Wayne E.....	E. E.	Sr.	Twin Falls
Guthrie, Eunice Jane.....	H. E.	Jr.	Corvallis
Guthrie, Leroy Roland.....	M. E.	Sr.	Corvallis
Haberer, Erwin Sam.....	For.	Jr.	Chicago, Ill.
Hackett, Joe F.....	Com.	Soph.	Corvallis
Hacking, Margaret May.....	Com.	Fr.	Corvallis
Hadley, Winnifred Edith.....	Opt.		Albany
Haffey, George.....	Com.	Voc.	Cape Horn, Wash.
Haines, Bernice Mae.....	H. E.	Fr.	Portland
Haley, Helen.....	H. E.	Jr.	Chicago, Ill.
Haley, Susan B.....	Com.	Fr.	Chicago, Ill.
Hall, Coral Clarice.....	H. E.	Spec.	Jerome, Idaho.
Hall, George Jay.....	Agri.	Soph.	Cottage Grove
Hall, Kenneth B.....	E. E.	Fr.	Pocatello, Idaho
Hall, Phila Henrietta.....	H. E.	Sr.	Fairfax, Vt.
Hall, Thorland R.....	Agri.	Soph.	Yakima, Wash.
Hamm, Winona Gertrude.....	Com.	Spec.	Corvallis
Hamman, Mabel.....	Opt.		Manzanola, Colo.
Hammond, Edmund P.....	M. E.	Jr.	Portland
Hammond, Josephine M.....	H. E.	Sr.	Silverton
Hammond, Louise Kerr.....	H. E.	Fr.	Hubbard, Ohio
Hampton, Eugene.....	Agri.	Fr.	Pendleton
Hanks, Harold F.....	E. E.	Fr.	Portland
Hanna, Wayne.....	Agri.	Fr.	Independence
Happold, Louie.....	E. E.	Sr.	Klondike
Harbke, Helen Mabe.....	Com.	Fr.	Portland
Hardie, Marjory.....	Com.	Spec.	Condon
Hargrove, Vivian.....	Com.	Soph.	Salem
Harnett, Francis B.....	Agri.	Soph.	Long Beach, Calif.
Harnish, Hedwig Hazel.....	Com.	Fr.	Gravel Ford
Harrington, Helen.....	H. E.	Jr.	Salem
Harrington, Ossie.....	H. E.	Voc.	Jacksonville

Name	Course	Rank	Home Address
Harris, Herbert V.....	E. E.	Soph.	Oregon City
Harris, Russell L.....	Min.	Fr.	Central Point
Harris, Wilda C.....	Com.	Voc.	Marshfield
Hart, Corintha Eleanor.....	Com.	Fr.	Albany
Hart, Glenn Ray.....	I. A.	Spec.	North Bend
Hart, Opal Frances.....	H. E.	Soph.	Cottage Grove
Harter, Arvilda Platte.....	Agri.	Jr.	Hatton, Wash.
Hartmann, Charles Harold.....	Agri.	Soph.	Holister, Calif.
Hartley, Chas. A.....	Agri.	Fr.	San Bernardino, Calif.
Hartley, Edwin A.....	Agri.	Sr.	Marshfield
Harvey, Andrew F.....	Agri.	Fr.	Pendleton
Harvey, Eudora Mae.....	H. E.	Fr.	Corvallis
Harvey, Joseph Paul.....	Chem. E.	Soph.	Portland
Harvey, Nora.....	H. E.	Soph.	Pendleton
Haseltine, Frances Gordon.....	H. E.	Voc.	Portland
Hastings, Martha Marie.....	Com.	Soph.	Springfield
Hatch, Horace Clinton.....	M. E.	Fr.	Oakland
Hatfield, Clifford Olcott.....	Phar.	Fr.	Central Point
Hatfield, John E.....	Com.	Soph.	Dixonville
Hathaway, Otto E.....	Com.	Fr.	Corvallis
Hathaway, Lois Reta.....	H. E.	Jr.	Corvallis
Hattan, Elton.....	Min.	Jr.	Oregon City
Hauge, Osmond Johann.....	Agri.	Fr.	Woodburn
Hawley, Francell.....	H. E.	Soph.	McCoy
Hay, William C.....	Phar.	Soph.	Lihae, Hawaii
Hayes, William Brewster.....	Agri.	Fr.	Pasadena, Calif.
Hayslip, Earle E.....	Log. E.	Jr.	Vancouver, Wash.
Hazen, Winifred.....	H. E.	Fr.	Snohomish, Wash.
Hearing, Leo.....	Agri.	Fr.	Haines
Heath, Eva Myrtle.....	Com.	Spec.	Newcastle Bridge, New Brunswick
Hedlund, Clara.....	H. E.	Fr.	Portland
Hedlund, Lillian Hancock.....	Opt.		Dallas, Texas
Heider, Lorena.....	H. E.	Jr.	Sheridan
Heinze, Anna Harriet.....	H. E.	Soph.	Portland
Heine, Mildred.....	Com.	Soph.	Medford
Helm, Genevieve M.....	H. E.	Voc.	Agness
Helm, Myrtle Edna.....	Com.	Fr.	North Bend
Henderson, George.....	Com.	Soph.	Barstow, Calif.
Henderson, Winfield Lester.....	Agri.	Soph.	Portland
Henricks, John Joseph.....	Agri.	Soph.	Florence
Hendricks, Ida Belle.....	H. E.	Fr.	Woodburn
Hendrickson, Martin.....	Chem. E.	Fr.	Orland, Calif.
Henry, Mildred.....	Com.	Fr.	Roseburg
Henry, William Bryan.....	Com.	Fr.	Jerome, Idaho
Henshaw, Fred Merritt.....	E. E.	Soph.	Portland
Hesshey, Hazel Mildred.....	Phar.	Fr.	Portland
Hesseltine, Earl Handley.....	Agri.	Soph.	Tulare, Calif.
Hettinger, Harry Howard.....	Agri.	Soph.	Portland
Hewitt, Harry Nutting.....	Phar.	Soph.	Red Oak, Iowa
Hewett, Melford Grant.....	E. E.	Soph.	Hubbard

Name	Course	Rank	Home Address
Hicks, Hazel Ione.....	H. E.	Soph.	Wieser, Idaho.
Hildreth, Franklin M.....	E. E.	Spec.	Bridgehampton, N. Y.
Hill, Alfred.....	M. E.	Fr.	Wilbur
Hines, Loyd L.....	I. A.	Voc.	Wasco
Hobart, Alvin Dewey.....	For.	Fr.	Silverton
Hoefer, Myron Page.....	Com.	Voc.	Astoria
Hodgson, Marion.....	H. E.	Sr.	Ashland
Hofmann, Chauncey Wm.....	For.	Fr.	Portland
Hogg, John Glenn.....	Agri.	Fr.	Salem
Hogshire, Joann.....	H. E.	Fr.	Portland
Holden, John W.....	Com.	Fr.	Portland
Holden, Jesse L.....	M. E.	Jr.	Portland
Holder, Chas.....	Com.	Voc.	Portland
Holgate, Laura C.....	Opt.		Corvallis
Holker, T. Booth.....	Agri.	Jr.	Toston, Mont.
Hollenberg, Leo D.....	Agri.	Sr.	Corvallis
Hollingsworth, Esther.....	Com.	Fr.	Newberg
Holmes, David Whittaker.....	Com.	Soph.	Almy, Wyo.
Holmes, Florence.....	Agri.	Soph.	Portland
Holmes, Horace H.....	Agri.	Fr.	North Bend
Holmes, H. P.....	Min.	Soph.	Corvallis
Holmes, Joseph Folger.....	For.	Soph.	Oakland, Calif.
Holmes, Lee Stanley.....	For.	Fr.	Portland
Holmes, Mary Vincent.....	Com.	Fr.	Portland
Holmes, Mildred M.....	Com.	Spec.	Corvallis
Holmes, Paul F.....	Agri.	Sr.	Los Angeles, Calif.
Holroyd, Imojean.....	H. E.	Soph.	Corvallis
Hooton, Arthur L.....	E. E.	Fr.	Coquille
Hoover, Bessie Ellen.....	H. E.	Fr.	Albany
Hope, George Milton.....	M. A.	Voc.	Vale
Hopson, Eric Ernest.....	Min.	Fr.	Portland
Horner, Clyde Dale.....	Phar.	Jr.	Corvallis
Horning, Gladys Louise.....	H. E.	Soph.	Corvallis
Horning, Martha Alberta.....	Com.	Fr.	Corvallis
Houck, Agnes Catherine.....	H. E.	Jr.	Portland
Houck, John Edwin.....	Com.	Fr.	Portland
Howard, Dale.....	Agri.	Jr.	Astoria
Howell, Mary Naomi.....	H. E.	Spec.	Corvallis
Howells, Katherine.....	H. E.	Sr.	Medford
Howey, Hazel Dell.....	Com.	Soph.	Corvallis
Howey, Olive Mary.....	H. E.	Soph.	Corvallis
Howser, May Zetta.....	H. E.	Fr.	Corvallis
Hoxsie, Ernest P.....	Agri.	Fr.	Folsom, Calif.
Hubbard, Clarissa S.....	H. E.	Soph.	Junction City
Hubbard, Clyde W.....	M. E.	Spec.	Weiser, Idaho
Hubbard, Eugene Field.....	Agri.	Fr.	Corvallis
Hubbard, Ina Mary.....	Phar.	Fr.	Rickreall
Hubbard, Verda.....	H. E.	Jr.	Rickreall
Huey, Olen Leroy.....	Agri.	Fr.	Pendleton
Huffaker, Neal.....	M. E.	Fr.	Idaho Falls, Idaho
Hughes, Robert Emmett.....	Phar.	Fr.	Heppner

Name	Course	Rank	Home Address
Hukari, Helia.....	Com.	Fr.	Hood River
Humfield, Harry.....	Agri.	Soph.	Portland
Hung, Tung Ming.....	Agri.	Sr.	Amoy, China
Hunt, John M.....	Agri.	Spec.	Westport
Hunter, Bernice.....	Com.	Fr.	Corvallis
Hunter, Elmer Dean.....	Agri.	Jr.	Portland
Hunter, Florence Lulu.....	Com.	Spec.	Albany
Hunter, Gilbert William.....	Agri.	Soph.	Island City
Hurd, Florence.....	H. E.	Jr.	Medford
Hurner, Frank Joe.....	E. E.	Soph.	Monmouth
Hurst, Genevieve.....	H. E.	Spec.	Portland
Husbands, Emily Rozella.....	H. E.	Fr.	Mosier
Husbands, Esther.....	H. E.	Sr.	Hood River
Husbands, Myrtle.....	Com.	Jr.	Hood River
Hutchings, E. Albert.....	Min.	Jr.	Brownsville
Hutchinson, Frank Cochrane.....	For.	Soph.	Salt Lake City, Utah
Hutchinson, Howard Boles.....	E. E.	Fr.	Portland
Hutchins, Gladys Georgene.....	H. E.	Soph.	Portland
Hyde, James B.....	Min.	Soph.	Portland
Hyde, Sara Esther.....	Opt.		Corvallis
Hymes, Walter L.....	M. E.	Fr.	Summit
Inman, Weslie Oliver.....	M. E.	Soph.	Vader, Wash.
Ireland, David Kenneth.....	Chem. E.	Fr.	Bellingham, Wash.
Ireland, Edith.....	H. E.	Soph.	Portland
Ireland, Orlive Le Roy.....	Phar.	Soph.	Portland
Irving, Ralph E.....	Agri.	Jr.	Harney
Irwin, Princess Lauretta.....	Com.	Spec.	Corvallis
Isherwood, Samuel Harold.....	I. A.	Spec.	Corvallis
Jack, Jeanette W.....	Com.	Fr.	Pendleton
Jackman, Oral Eva.....	H. E.	Fr.	Lynden, Wash.
Jacobson, Roma.....	Com.	Fr.	La Grande
Jacoby, Fred.....	Agri.	Sr.	Portland
Jaskson, Helen P.....	Com.	Fr.	Portland
Jasper, Merrell Clair.....	Min.	Fr.	Baker
Jenkins, Doris Mildred.....	H. E.	Fr.	Portland
Jenkins, John Donald.....	Chem. E.	Soph.	Portland
Jenks, Marylee.....	H. E.	For.	Tangent
Jepperson, John.....	Agri.	Spec.	Bacona
Jernstedt, Leonard R.....	Agri.	Soph.	Carlton
Jessen, Ralph Frank.....	Agri.	Soph.	Piedmont, Calif.
Jessup, Geoge LeRoy.....	Agri.	Jr.	Portland
Jetley, Arthur C. L.....	C. E.	Sr.	Crane
Jewel, Herbert H.....	Com.	Sr.	Portland
Jewel, Paul W.....	Phar.	Soph.	Corvallis
Jewell, Robert L.....	Min.	Fr.	Grants Pass
John, S. Helen.....	H. E.	Soph.	Corvallis
Johnson, Chris Edward.....	Phar.	Sr.	North Powder
Johnson, Edlie Marjorie.....	H. E.	Soph.	Hermiston
Johnson, Ellen Otten.....	H. E.	Fr.	Portland
Johnson, Gladys Viola.....	H. E.	Fr.	Scappoose
Johnson, John Iver.....	Agri.	Jr.	Winlock, Wash.

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Johnson, Loren Albert.....	Agri.	Soph.	Scappoose
Johnson, Robert H.....	Agri.	Fr.	Redmond
Johnson, Willard.....	For.	Sr.	Corvallis
Johnston, Charles M.....	For.	Soph.	Portland
Johnston, Clarence Edwin.....	L. E.	Soph.	Portland
Johnston, Lyle.....	E. E.	Fr.	Klamath Falls
Johnston, Marie Elizabeth.....	Com.	Voc.	Portland
Jones, Charlotte Louise.....	Com.	Soph.	La Grande
Jones, Edward Dee.....	M. E.	Soph.	Corvallis
Jones, Frieda Buryle.....	Com.	Fr.	Corvallis
Jones, Genevieve M.....	Com.	Fr.	Oregon City
Jones, Margaret Frances.....	H. E.	Fr.	Corvallis
Jones, Paul Frank.....	E. E.	Fr.	Eugene
Jones, Ronald Ewart.....	Agri.	Sr.	Brooks
Jones, William Conrad.....	Agri.	Soph.	Ottowa, Kan.
Jory, Elmo C.....	Phar.	Sr.	Salem
Josephson, Ethel Margaret.....	Com.	Fr.	Marshfield
Jower, Henry.....	M. E.	Fr.	Portland
Justo, Robert Nolasco.....	Agri.	Jr.	Buenos Aires, Argentine
Kaegi, Maye F.....	Opt.		Wilbur
Kaegi, Morrice C.....	Phar.	Soph.	Wilbur
Kasberger, Joseph.....	Agri.	Fr.	The Dalles
Keatley, Robert Leland.....	Agri.	Fr.	Castle Rock, Wash.
Keck, Rufus C.....	Agri.	Jr.	Pattstown, Pa.
Keil, Wilhelm Frederick.....	Agri.	Fr.	Cosmopolis, Wash.
Keller, Eugene John.....	Agri.	Soph.	Astoria
Keller, Leota Iola.....	H. E.	Voc.	Ashland
Kellogg, Chandler.....	Com.	Fr.	Los Angeles, Calif.
Kellogg, Ralph Lester.....	C. E.	Jr.	Portland
Kelly, Eva.....	H. E.	Soph.	Corvallis
Kelly, Jean M.....	Agri.	Soph.	Corvallis
Kelly, Ruth.....	H. E.	Sr.	Corvallis
Kelsey, Hazel.....	H. E.	Soph.	Columbia City, Ind.
Kempin, Flora.....	H. E.	Spec.	Corning, Kan.
Kennedy, David Honore.....	Agri.	Soph.	Portland
Kennedy, Ruth Henrietta.....	H. E.	Jr.	Corvallis
Kenny, Dora Lotella.....	H. E.	Jr.	Portland
Kenyon, Alfred William.....	Agri.	Fr.	Salem
Kephart, Olga Ahlson.....	H. E.	Spec.	Hillsdale
Keppinger, Verne M.....	H. E.	Jr.	Gervais
Kern, Dorothy Alma.....	H. E.	Fr.	Washougal, Wash.
Kerr, Genieve.....	H. E.	Soph.	Corvallis
Kiddle, Lyle Blair.....	Com.	Sr.	Island City
Kies, Gladys Ruth.....	H. E.	Fr.	Vancouver, Wash.
Kincaid, William Brayton.....	Agri.	Fr.	Portland
King, Florence Kathleen.....	Com.	Fr.	Corvallis
King, Philip S.....	Agri.	Sr.	Portland
King, Rudolph Jack.....	Agri.	Jr.	Grand Rapids, Mich.
Kingsley, Everette Ellenor.....	H. E.	Jr.	Hermiston
Kinzey, Robert T.....	Com.	Jr.	Prairie City
Kirchenschlager, Delbert.....	Agri.	Fr.	Monrovia, Cal.

Name	Course	Rank	Home Address
Kirk, Arthur A.	E. E.	Fr.	Freewater
Kirkland, Robin Watson	Agri.	Voc.	Westham Island, B. C.
Kistner, Vernice Anna	H. E.	Fr.	Ontario, Calif.
Klages, Karl W. H.	Agri.	Fr.	Corvallis
Kleinau, Carl Samuel	M. E.	Fr.	Jerome, Idaho
Klingeale, Louie P.	E. E.	Fr.	Salem
Knapp, Veva Ella	H. E.	Fr.	Camas, Wash.
Knight, Maurice R.	Agri.	Soph.	Santa Ana, Calif.
Knips, Avis Irma	H. E.	Fr.	Grants Pass
Knoll, Lillian Sikes	H. E.	Spec.	Corvallis
Knoll, Paul X.	For.	Spec.	Denton, Mont.
Knowles, Inez N.	H. E.	Sr.	La Grande
Knox, Theron Edwin	Com.	Fr.	John Day
Kocken, Walter J.	Hort.	Sr.	Cleveland
Koerber, Dorothea M.	Com.	Fr.	Portland
Kooreman, Milton A.	M. E.	Jr.	Salem
Koller, Frank A.	For.	Soph.	Astoria
Kramien, Lionel C.	Phar.	Soph.	Newberg
Kreamer, Madeline	H. E.	Fr.	Independence
Krueger, Clarence W.	E. E.	Sr.	Corvallis
Krueger, Hans Luie	E. E.	Fr.	Corvallis
Kuklin, June May	H. E.	Jr.	Salem
Kung, Shih Lung	Agri.	Fr.	Kiangsi, China
Kurtz, Martin	Com.	Sr.	Corvallis
Kyle, Elmer E.	Agri.	Fr.	Central Point
Kyle, Hugh Wallace	L. E.	Fr.	Portland
Kyle, Kittie Gertrude	H. E.	Sr.	Corvallis
Kyle, Robert Floyd	Com.	Soph.	Central Point
Lafky, Herman Ernest	Agri.	Jr.	Corvallis
Lagus, Sigurd W.	Min.	Jr.	Astoria
Lahti, Edward Andrew	Phar.	Spec.	Astoria
Laing, Mabel Elsie	Phar.	Jr.	Eugene
Lamar, Howard Loring	Phar.	Soph.	Tillamook
Landess, Dorothy	H. E.	Fr.	Dayton
Landram, Telete	H. E.	Jr.	Merced, Calif.
Lane, Dorothy Elizabeth	H. E.	Sr.	Hollywood, Calif.
Langley, Ethel Mary	Com.	Fr.	Portland
Lankeneau, Walter Henry	For.	Sr.	New York, N. Y.
Lankins, Hazel Claire	H. E.	Sr.	Hubbard
Larsen, Edwin E.	M. E.	Fr.	Suver
Larsen, Lillie L.	H. E.	Fr.	Laurel
Larson, Clarence Elmer	Agri.	Soph.	Long Beach, Calif.
Larson, Raymond Gilbert	Agri.	Jr.	Fairfield, Iowa
Lascar, Adhar Chandra	E. E.	Sr.	Calcutta, India
Lathim, Kenley Brownhill	Com.	Spec.	The Dalles
Lathrop, Willis F.	E. E.	Soph.	Portland
Law, Turah Anna	H. E.	Fr.	Corvallis
Layton, Clarin J.	M. E.	Fr.	Rathdrum, Idaho
Layton, Helen	Com.	Soph.	Grants Pass
Leech, Archer Olin	M. E.	Sr.	Corvallis
Legg, Gladys Loretta	H. E.	Sr.	Portland

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Lemmon, Oral Miskell.....	Phar.	Soph.	Salem
Lenox, Gladys.....	H. E.	Soph.	Klamath Falls
Le Peau, Nathaniel X.....	Hi. E.	Soph.	Canton, Ohio
Lesh, Laurence Y.....	Com.	Fr.	Corvallis
Lewis, Garfield Orr.....	Agri.	Soph.	Portland
Lewis, John Mitchell.....	Agri.	Sr.	Corvallis
Lewis, Louise.....	Com.	Sr.	Portland
Lewis, Mary Adele.....	H. E.	Fr.	Corvallis
Lewis, Ronald Edward.....	Com.	Fr.	McMinnville
Lewis, Willard.....	Agri.	Fr.	Lostine
Liddell, John W.....	Agri.	Fr.	Oakland, Calif.
Lienkaemper, Gertrude.....	H. E.	Fr.	Portland
Lindsay, Annie McDonald.....	H. E.	Sr.	Corvallis
Lindsay, Edith McOnie.....	H. E.	Soph.	Corvallis
Lindsay, Velda B.....	Agri.	Fr.	Salem
Linville, Myrtle Harriet.....	H. E.	Jr.	Astoria
Lister, Violet.....	Com.	Fr.	Paulina
Littler, Florence Elizabeth.....	H. E.	Sr.	Forest Grove
Livengood, Kathrine Gene.....	Opt.		Albany
Livengood, Ruth Eleanor.....	Com.	Fr.	Albany
Livery, Anne.....	Com.	Soph.	Liberty, Neb.
Lockley, Lawrence C.....	Com.	Fr.	Portland
Lodell, Carl A.....	Com.	Soph.	Portland
Loennig, Franklin Lang.....	Agri.	Fr.	Haines
Logan, Carlton Kneelan.....	Com.	Jr.	Albany
Long, Carl Douglas.....	Com.	Soph.	Oakland
Long, Ethel D.....	Com.	Soph.	Caldwell, Idaho
Longwell, Earl Harry.....	Agri.	Fr.	Hawthorne, Calif.
Loop, Charles R.....	Agri.	Jr.	McMinnville
Loosley, Merle John.....	Agri.	Soph.	Fort Klamath
Lorence, Jennings Bryan.....	M. E.	Sr.	Monmouth
Loughary, Elithe.....	H. E.	Sr.	Monmouth
Love, Annis.....	H. E.	Sr.	Junction City
Lowe, Alexander Robertson.....	Min.	Fr.	Seattle, Wash.
Lowe, Thomas Julian.....	Agri.	Jr.	Nyssa
Lowry, Edith Mae.....	H. E.	Soph.	Bellingham, Wash.
Loy, Alfred Walter.....	Agri.	Fr.	Buena Vista
Luebke, George.....	L. E.	Soph.	Toutle, Wash.
Luebke, James.....	M. E.	Jr.	Toutle, Wash.
Lundgren, Alice.....	H. E.	Jr.	Corvallis
Luper, Loren John.....	Agri.	Soph.	Tangent
Lyne, Phyllis Ellen.....	H. E.	Spec.	Creston, B. C.
Lytle, Grace.....	Com.	Fr.	Bonanza
McBride, Lola Winifred.....	H. E.	Jr.	Eddyville
McCaffrey, Lawrence Martin.....	For.	Sr.	Dayton, Ohio
McCain, Isla Mae.....	Com.	Soph.	Corvallis
McCart, Marion.....	Agri.	Fr.	McMinnville
McCaslin, Clifford H.....	Agri.	Fr.	Portland
McCaw, Bessie Constance.....	H. E.	Soph.	Prescott, Wash.
McCaw, Ernest R.....	Agri.	Spec.	Prescott, Wash.
McCaw, Jay M.....	Agri.	Spec.	Prescott, Wash.

Name	Course	Rank	Home Address
McCaw, Ruth Ida.....	H. E.	Fr.	Prescott, Wash.
McCaw, William Edwin.....	Agri.	Spec.	Prescott, Wash.
McClain, Arthur Elmer.....	Com.	Jr.	Salem
McClanathan, Robert Allen.....	Hi. E.	Soph.	Astoria
McCollum, Charles Adelbert.....	For.	Sr.	Salinas, Calif.
McComb, Allen Wallace.....	Agri.	Soph.	Klamath Falls
McCormack, Raymond Elwood.....	C. E.	Fr.	Roseburg
McCornack, Alice.....	H. E.	Sr.	Marcola
McCornack, Eugene Francis.....	Agri.	Sr.	Klamath Falls
McCornack, Helen J.....	H. E.	Soph.	Marcola
McCready, Lloyd John.....	Com.	Fr.	Corvallis
McCullough, Addie.....	H. E.	Jr.	Portland
McDonald, Mrs. H. C.....	Com.	Spec.	Corvallis
McEwen, Dan F.....	Agri.	Sr.	Portland
McEwen, Robert V.....	Agri.	Fr.	Milton
McGeorge, William Lee.....	C. E.	Sr.	Eugene
McGinnis, Mrs. Lynette Kerr.....	Com.	Spec.	Corvallis
McGinty, Walter Gibson.....	Agri.	Voc.	Davis Creek, Calif.
McGilchrist, George M.....	Agri.	Soph.	Salem
McGowan, Earl.....	E. E.	Fr.	Corvallis
McHugh, Edith Lillian.....	Com.	Spec.	Corvallis
McIntyre, John Henry.....	Agri.	Fr.	Coalinga, Calif.
McKay, Harold Delwin.....	Com.	Fr.	Corvallis
McKinnis, Fern.....	Com.	Spec.	Summerville
McKnight, Mildred.....	H. E.	Fr.	Albany
McLagan, Eva Crystal.....	Phar.	Jr.	Tangent
McLagan, Ruby May.....	H. E.	Sr.	Tangent
McLeary, Robert William.....	Chem. E.	Fr.	Albany
McMaster, Marion Edna.....	Com.	Spec.	Corvallis
McMaster, Cedric Stuart.....	Agri.	Sr.	Corvallis
McMindes, Elvin Winfield.....	Agri.	Sr.	Milwaukee, Wis.
McMinn, Bryan Towne.....	M. E.	Sr.	Portland
McMinn, Grace Blanche.....	Phar.	Soph.	Portland
McPherson, Walter Jay.....	M. A.	Spec.	Forest Grove
McRae, Mary Ellen.....	Opt.		Riverside
McReynolds, Jasper Alvin.....	Com.	Voc.	Dufur
Maag, Esther Verna.....	H. E.	Jr.	Salem
Mack, Lawrence Wallace.....	M. E.	Sr.	Dufur
Maclean, Pauline.....	H. E.	Fr.	Portland
MacCrow, Hughretta.....	Com.	Spec.	Goldendale, Wash.
MacDonald, Horace.....	Chem. E.	Fr.	Corvallis
Madsen, Alvin H.....	Agri.	Spec.	Silverton
Madsen, Lillie Lauretta.....	Com.	Fr.	Silverton
Magness, Virginia Byrd.....	H. E.	Spec.	Amity
Magnuson, Hazel J.....	H. E.	Jr.	Everett, Wash.
Mahan, Adelaide Stevens.....	H. E.	Soph.	Chicago, Ill.
Mahan, Susie.....	Com.	Fr.	Baker
Mainwaring, William Bernard.....	Com.	Jr.	Newberg
Malone, Earl Nicholas.....	Agri.	Jr.	Castle Rock, Wash.
Manning, Allen Munroe.....	E. E.	Soph.	Vancouver, Wash.

Name	Course	Rank	Home Address
Manning, George E.	Com.	Soph.	Salem
Manny, Ida Lillian	H. E.	Jr.	Portland
Manny, Margaret W.	H. E.	Fr.	Portland
Mardis, Loche H.	Com.	Jr.	McMinnville
Marsh, Isis	H. E.	Spec.	Marshfield
Marshall, Julian Stephen	Min.	Jr.	Corvallis
Martens, Mamie	Com.	Soph.	Chinook, Mont.
Martens, Marcus Henry	Com.	Fr.	Chinook, Mont.
Martin, Emily C.	H. E.	Soph.	Corvallis
Martin, Elsie Paulien	H. E.	Jr.	McMinnville
Martin, Lois Maeble	H. E.	Fr.	McMinnville
Mason, Ben	M. E.	Sr.	Puyallup, Wash.
Mason, Earl George	For.	Jr.	Salem
Mason, Howard	Agri.	Jr.	Pasadena, Calif.
Mather, Irving Allen	Chem. E.	Soph.	San Diego, Calif.
Mathiesen, Edwin L.	Com.	Voc.	Grays River, Wash.
Matten, Alta Elizabeth	H. E.	Fr.	Salem
Matthews, Aner Logan	Agri.	Fr.	Amity
Mattox, William Forrest	Min.	Soph.	Long Beach, Calif.
Maurer, Pansy	Phar.	Jr.	Eugene
Maxwell, Ben	Agri.	Fr.	Salem
Maxwell, Grace Eleanor	H. E.	Soph.	Weiser, Idaho
Maxwell, Omer Oliver	Agri.	Fr.	Haines
May, Lulu Litten	H. E.	Sr.	Grass Valley
Meacham, Clifford P.	Agri.	Soph.	Weiser, Idaho
Meacham, Leta M.	H. E.	Sr.	Weiser, Idaho
Meade, William Vanard	M. E.	Soph.	Orengo
Medler, Arthur Henry	Com.	Voc.	Wasco
Medley, James W.	M. E.	Fr.	Oakland
Meier, Albert Otto	Agri.	Sr.	Hillsdale
Melis, Fannie Elizabeth	H. E.	Fr.	Mist
Meloy, Kathleen O.	Com.	Fr.	Corvallis
Meloy, Lulu V.	Com.	Fr.	Corvallis
Mende, Herman W.	Agri.	Fr.	North Bend
Mentzer, Alta Belle	H. E.	Fr.	Corvallis
Mentzer, Leland	I. A.	Jr.	Pendleton
Merritt, Mona Rosalie	Opt.		Corvallis
Mesher, Sophie	H. E.	Sr.	Portland
Meyer, Arnold	M. E.	Fr.	Snohomish, Wash.
Meyer, Laura Minnie	Com.	Voc.	Centralia, Wash.
Meyer, Leland Edward	Agri.	Fr.	Palo Alto, Calif.
Middlekauf, Ruth Helen	H. E.	Soph.	Corvallis
Mihnos, Edythe Victoria	Com.	Fr.	Portland
Milledge, Faye Mildred	Com.	Fr.	Roseburg
Miller, Alice Ruth	Com.	Soph.	Corvallis
Miller, Cecil Harold	Agri.	Fr.	Peoria, Ariz.
Miller, Clare Alfred	E. E.	Soph.	Oregon City
Miller, Curtis	Com.	Soph.	Union
Miller, Eula Ellen	H. E.	Jr.	Corvallis
Miller, Leslie A.	Agri.	Soph.	Grand Forks, B. C.
Miller, Lloyd C.	E. E.	Soph.	Portland

Name	Course	Rank	Home Address
Miller, Maude.....	H. E.	Spec.	Klamath Falls
Mills, Harold Milton.....	Agri.	Sr.	Parma, Idaho
Misson, William H.....	C. E.	Fr.	Arleta
Mize, Katie Olive.....	H. E.	Fr.	Salem
Moberg, James Dalgety.....	E. E.	Sr.	Astoria
Mohney, Curtis Gilliam.....	Min.	Soph.	Salem
Moody, Charlotte Elizabeth.....	H. E.	Sr.	Pasadena, Calif.
Moon, Oris Orville.....	M. E.	Fr.	Fort Klamath
Moore, Edwin M.....	For.	Spec.	Corvallis
Moore, Genevieve.....	H. E.	Soph.	Corvallis
Moore, Iva Grace.....	Com.	Fr.	Corvallis
Moore, Leland Bernard.....	Agri.	Sr.	Gresham
Moore, Myra Lucille.....	H. E.	Sr.	Corvallis
Moore, Neva L.....	Com.	Fr.	Corvallis
Morcom, Etta M.....	H. E.	Soph.	Corvallis
Morcom, Margaret Myrtle.....	H. E.	Soph.	Corvallis
Morgan, Beulah Inez.....	H. E.	Sr.	Corvallis
Morgan, Charles Leslie.....	E. E.	Soph.	Portland
Morgan, Helen.....	H. E.	Voc.	Portland
Moreland, Clark E.....	Agri.	Voc.	Corvallis
Moreland, Heber M.....	Agri.	Fr.	Corvallis
Moreland, Helen Margaret.....	H. E.	Fr.	Portland
Morley, Frances M.....	H. E.	Soph.	Silverton
Morrell, Alfred W.....	Agri.	Soph.	Arcata, Calif.
Morrell, Arta Belle.....	H. E.	Fr.	Deer Island
Morrill, Dorothy Clark.....	H. E.	Soph.	Vancouver, B. C.
Morris, Homer B.....	M. E.	Sr.	Yamhill
Morris, Ray A.....	Agri.	Jr.	Oregon City
Morrison, Ernest.....	E. E.	Soph.	Roseburg
Morrow, William Harold.....	Agri.	Jr.	Portland
Morse, Leander Charles.....	Agri.	Fr.	Berkeley, Calif.
Morton, Arthur Hale.....	Agri.	Fr.	Camas, Wash.
Morton, Ruth.....	H. E.	Sr.	White Salmon, Wash.
Mose, Donald Wesley.....	E. E.	Fr.	Corvallis
Moulton, Arthur S.....	Agri.	Jr.	Portland
Moulton, Edna Anna.....	Agri.	Fr.	Portland
Muller, Ruth Margaret.....	H. E.	Jr.	Eugene
Munkers, Frances.....	Com.	Fr.	Portland
Munson, Robert Bliss.....	Com.	Soph.	New York, N. Y.
Murhard, Erroll Alexander.....	C. E.	Soph.	Portland
Murray, Albert Samuel.....	E. E.	Fr.	Vale
Murray, Willette B.....	Agri.	Fr.	Hawthorne, Calif.
Murphy, Harry C.....	For.	Fr.	Portland
Mushrush, Floyd Milton.....	Min.	Fr.	Pasadena, Calif.
Myers, Clair E.....	Phar.	Soph.	Pendleton
Myers, Clarence William.....	Agri.	Sr.	Moneta, Calif.
Myers, Francis P.....	M. E.	Sr.	Corvallis
Myers, George Edward.....	M. E.	Fr.	Corvallis
Myers, Ruth Eleanor.....	Phar.	Fr.	Corvallis
Myers, Stanley Howard.....	E. E.	Sr.	Corvallis
Naderman, George.....	M. E.	Jr.	Turner

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Naftel, Veda Pearl.....	H. E.	Spec.	Pomona, Calif.
Neal, Martena Ruth.....	H. E.	Sr.	Santa Cruz, Calif.
Nebergall, Raymond Arthur.....	For.	Fr.	Albany
Nelson, Herbert.....	Agri.	Soph.	Mt. Vernon, Wash.
Nesbitt, Clarence Scott.....	Com.	Sr.	Payette, Idaho
Nestelle, Fred W.....	Agri.	Sr.	Bellingham, Wash.
Nettleton, Harry Ira.....	Agri.	Soph.	La Porte, Colo.
Neuhaus, Karl Frank.....	Agri.	Jr.	Corvallis
Nevius, John R.....	Agri.	Jr.	Long Beach, Calif.
Newbry, Lester Edward.....	Agri.	Fr.	Kimberly, Idaho
Newcomber, Lucian Edwin.....	Agri.	Soph.	Colton, Calif.
Newman, Meier.....	Com.	Sr.	Portland
Newport, Beatrice Ione.....	Opt.		Lebanon
Newton, Ralph L.....	Agri.	Spec.	Drain
Niblen, Amy C.....	H. E.	Sr.	Portland
Nichols, Benjamin Hodge.....	M. E.	Jr.	Glendale, Calif.
Nichols, Eleanor Bailey.....	Com.	Soph.	The Dalles
Nichols, Floyd Myron.....	E. E.	Jr.	Corvallis
Nichols, Tressa Elizabeth.....	Com.	Sr.	Corvallis
Nicholson, Frances.....	Phar.	Fr.	Puyallup, Wash.
Nielson, Sidney M.....	Agri.	Jr.	Ferndale, Calif.
Niles, Wallace.....	Agri.	Fr.	Grants Pass
Nisson, Clara Mae.....	Com.	Spec.	Corvallis
Noble, Audrey M.....	H. E.	Soph.	Prineville
Nordling, David M.....	I. A.	Sr.	Colton
Norgren, Clarence.....	Agri.	Fr.	Vancouver, Wash.
Norris, Rita.....	H. E.	Jr.	Boise, Idaho
North, David Starr.....	I. A.	Sr.	Corvallis
Norton, Mabel.....	H. E.	Spec.	Corvallis
Norton, Winfield Leonard.....	Agri.	Jr.	Corvallis
Nunn, Harry.....	Com.	Fr.	Corvallis
Oakleaf, Ruth D.....	Com.	Soph.	Washington, D. C.
Oatfield, Ernest W.....	Agri.	Voc.	Skamokawa, Wash.
Officer, Joseph Wade.....	Agri.	Spec.	Izee
Oliver, Alfred W.....	Agri.	Sr.	Salem
Olsen, Edward Carl.....	Com.	Fr.	Portland
Olson, Philip James.....	M. A.	Voc.	Grays River, Wash.
Olson, Sigfred Gustav.....	E. E.	Fr.	Albany
Opedal, Martha.....	H. E.	Soph.	Silverton
O'Rourke, Edgar M.....	Com.	Fr.	Mountaindale
Orr, George David.....	Agri.	Soph.	Corvallis
Orr, John Judson.....	I. A.	Soph.	Corvallis
Oschmann, Walter S.....	M. E.	Spec.	Chicago, Ill.
Ostien, Tom L.....	Min.	Soph.	Monmouth
Ostrander, Aubrey.....	Agri.	Jr.	Portland
Ostrander, Wilbur Wesley.....	M. A.	Voc.	Gold Beach
Overstreet, Robert S.....	Agri.	Voc.	Nyssa
Packard, Otto Bernard.....	E. E.	Soph.	Santa Ana, Calif.
Paine, Cecile Elma.....	Com.	Spec.	Corvallis
Paine, Charles L.....	Com.	Sr.	Caldwell, Idaho
Paine, Mrs. Chas. L.....	H. E.	Soph.	Eugene

Name	Course	Rank	Home Address
Paine, John D.....	Agri.	Soph.	Caldwell, Idaho
Paine, Lincoln H. Jr.....	Com.	Sr.	Caldwell, Idaho
Palfrey, Ernest Ralph.....	Agri.	Fr.	Molalla
Palmer, Beatrice Lucy.....	Com.	Fr.	Cowichan Sta., B. C.
Palmer, Bert Cecil.....	Com.	Jr.	Jordan Valley
Palmer, Lowell Elbert.....	Com.	Soph.	Jordan Valley
Papenfus, Edith Marie.....	H. E.	Fr.	Creswell
Pardee, Josiah B.....	E. E.	Fr.	Grants Pass
Parker, Alan B.....	Agri.	Soph.	Pasadena, Calif.
Partin, Rae.....	H. E.	Sr.	Summer Lake
Parsons, Cyril Malcolm.....	Hi. E.	Soph.	Bonanza
Patchin, Alonzo William.....	Agri.	Fr.	Salem
Paterson, Daniel McColl.....	Agri.	Spec.	Portland
Patton, Palmer.....	Agri.	Sr.	Chicago, Ill.
Patty, Florence Valeria.....	H. E.	Soph.	Amity
Pauling, Linus Carl.....	Chem. E.	Fr.	Portland
Paull, James Gregory.....	Agri.	Sr.	Los Angeles, Calif.
Paulson, Anna Josephine.....	H. E.	Voc.	Corvallis
Paulson, Oscar.....	Agri.	Soph.	Corvallis
Payne, George Franklin.....	Agri.	Fr.	Corvallis
Payne, Eugene Fulwar.....	Agri.	Soph.	Corvallis
Payton, Wesley Eugene.....	Agri.	Fr.	Baker
Payzant, Charles Y.....	Agri.	Spec.	Chehalis, Wash.
Pearson, Edna J.....	H. E.	Fr.	Portland
Pearson, Lillian Jenkins.....	Com.	Fr.	Roseburg
Peaslee, Ruth E.....	H. E.	Spec.	Oswego
Peavy, Bradley A.....	For.	Soph.	Corvallis
Pecson, Evaristo C.....	Com.	Fr.	Pangasinan, P. I.
Pendergrass, Travis Ray.....	Phar.	Spec.	Clovis, Calif.
Pernot, Dorothy Doris.....	H. E.	Fr.	Corvallis
Perry, Dale Alfred.....	Agri.	Soph.	St. Helens
Perry, Jesse Lee.....	C. E.	Soph.	Portland
Peterson, Alice A.....	Com.	Fr.	Chehalis, Wash.
Peterson, Carl Albin.....	M. E.	Fr.	Orencia
Peterson, Inez Mae.....	Com.	Jr.	Corvallis
Peterson, Nettie Lucile.....	H. E.	Fr.	Ontario
Peterson, Sigurd H.....	Opt.		Corvallis
Pettigrew, Ruth.....	Com.	Fr.	Redmond
Phillips, Alfred B.....	Agri.	Fr.	Kelso, Wash.
Phillips, Hazel Elsie.....	Com.	Jr.	Izee
Phillips, James Robert.....	For.	Soph.	Corvallis
Phillips, Kenneth.....	C. E.	Soph.	Albany
Phillips, Ruth Haas.....	Com.	Spec.	Corvallis
Phinney, Irene A.....	H. E.	Fr.	Kelso, Wash.
Pierce, Lucile.....	H. E.	Soph.	La Grande
Pietzker, Henry Fred.....	H. E.	Jr.	Portland
Pigg, Frederica I.....	Com.	Fr.	Anaconda, Mont.
Pimm, Charles Jesse.....	E. E.	Sr.	Philomath
Pine, Willaim Douglas.....	Agri.	Sr.	Berkeley, Calif.
Pinney, Earl H.....	E. E.	Soph.	Newberg
Pitney, Mary Eleanor.....	H. E.	Sr.	Junction City

Name	Course	Rank	Home Address
Planta, Olive Montgomery.....	Agri.	Spec.	Nanaimo, Canada
Platt, Eugene Dewey.....	Agri.	Fr.	Claremont, Calif.
Plue, Vilas Leone.....	Com.	Sr.	Rainier
Poley, Evangeline Collins.....	H. E.	Soph.	Ashland
Pollanz, Percy Edward.....	Agri.	Soph.	West Linn
Polson, Nellie Irene.....	H. E.	Sr.	Mt. Vernon, Wash.
Poole, Leslie Erving.....	M. E.	Soph.	Corvallis
Poole, Roy M.....	Min.	Jr.	Hillsboro
Porter, Mildred.....	Com.	Fr.	Corvallis
Porter, Nellie Bly.....	H. E.	Soph.	Silverton
Posadas, Victorina C.....	Com.	Fr.	Bacnotan, P. I.
Powell, Claes Clinton.....	E. E.	Soph.	Monmouth
Powell, Delma Ester.....	Com.	Spec.	Corvallis
Powell, DeWitt Elvin.....	Min.	Soph.	Corvallis
Powell, George Arthur.....	Com.	Fr.	Portland
Powell, Perry Nelson.....	M. E.	Fr.	Monmouth
Powell, Wilmer Dwight.....	Agri.	Jr.	Monmouth
Powers, Robert M.....	For.	Fr.	Corvallis
Powers, Verne.....	H. E.	Jr.	Corvallis
Prather, Harry Albert.....	Phar.	Soph.	Klamath Falls
Prather, Marie Alma.....	Com.	Jr.	Corvallis
Presley, A. C.....	Agri.	Soph.	Grants Pass
Preston, Edward Lincoln.....	Agri.	Jr.	Dallas
Price, Elise Groves.....	H. E.	Soph.	Sifton, Wash.
Price, F. Earl.....	Agri.	Fr.	Woodlake, Calif.
Price, Frank Emerson.....	For.	Spec.	Illahee
Price, Gladys Beatrice.....	H. E.	Fr.	Oakland
Price, Inez Fay.....	H. E.	Spec.	Springfield
Price, Martha Jane.....	Com.	Voc.	Illahee
Proctor, Will Henry.....	Com.	Soph.	Ogdensburg, N. Y.
Proudfit, Arthur.....	Agri.	Fr.	Salt Creek, Wyo.
Pubols, Freida Martha.....	Com.	Spec.	Hillsboro
Pugh, James E.....	Opt.		Wrens
Pugh, John McKinley.....	Agri.	Soph.	Shedd
Quimby, Ethel Annette.....	H. E.	Fr.	Halsey
Quackenbush, Roy M.....	E. E.	Fr.	Portland
Raab, Lloyd B.....	Com.	Fr.	Seattle, Wash.
Rachford, Darrell Wm.....	For.	Fr.	Alturas, Calif.
Radcliff, Edward Everett.....	Agri.	Jr.	Burbank, Calif.
Rahn, Fred William.....	Agri.	Fr.	Pasadena, Calif.
Rains, Opal.....	H. E.	Jr.	Oregon City
Ray, Howard C.....	Agri.	Sr.	Roslyn, Wash.
Ray, Margaret Wright.....	H. E.	Fr.	Portland
Raymond, James A.....	C. E.	Fr.	Drain
Raymond, Thayer.....	H. E.	Jr.	Raymond, Wash.
Reardon, Barton.....	I. A.	Jr.	Corvallis
Rearden, Henry.....	Com.	Jr.	Corvallis
Reber, Albert R.....	Agri.	Sr.	Kansas City, Kan.
Records, Warren Willis.....	Agri.	Soph.	Umapine
Redmond, Agnes Theresa.....	H. E.	Sr.	Portland
Reed, Ada.....	H. E.	Sr.	Portland

Name	Course	Rank	Home Address
Reed, Eldred B.	I. A.	Fr.	Corvallis
Reed, Florence Helen	Com.	Voc.	Portland
Rees, Elsie Fern	H. E.	Fr.	Ontario
Reeves, Carroll Francis	M. E.	Fr.	Corvallis
Regnell, Lloyd Clifford	For.	Jr.	Hood River
Reichart, Natalie	Com.	Fr.	Corvallis
Reitsma, Catharina	H. E.	Soph.	Portland
Rencehausen, William Edwin	Com.	Fr.	North Bend
Resing, J. Lucille	Com.	Fr.	Portland
Reynolds, Cecil E.	L. E.	Fr.	Colton, Calif.
Reynolds, Earl Childers	Agri.	Jr.	La Grande
Reynolds, Gladys Opal	H. E.	Soph.	Independence
Reynolds, Joe A.	Agri.	Fr.	La Grande
Reynolds, Loren F.	E. E.	Fr.	Selma
Rhea, Hugh	M. E.	Fr.	Echo
Rice, Gladys	H. E.	Jr.	Corvallis
Rice, Leaton Alanson	Min.	Sr.	Corvallis
Richards, Cordelia Dale	Com.	Voc.	Goldendale, Wash.
Richards, Eva	H. E.	Fr.	Salem
Richards, Thomas Edmund	Agri.	Fr.	Kimberly, Idaho
Richards, William Francis	Agri.	Voc.	Twin Falls, Idaho
Richardson, Elizabeth Clay	Com.	Soph.	Portland
Riches, Harry LaBare	Agri.	Spec.	Silverton
Richter, Paul E.	Agri.	Jr.	Portland
Ricketts, Ellsworth Gould	Hi. E.	Jr.	Portland
Ricketts, Fay Lincoln	Com.	Fr.	Portland
Rickson, Carl A.	For.	Soph.	Portland
Riddell, Christine Elsie	H. E.	Spec.	Mountain Home, Idaho
Riggs, Leib L.	Chem. E.	Fr.	Corvallis
Riippa, Warnard	Chem. E.	Jr.	Astoria
Ritchie, Douglas Wm.	Agri.	Sr.	Corvallis
Ritter, Herman M.	Agri.	Fr.	Pasadena, Calif.
Roake, John Albert	Chem. E.	Soph.	Oregon City
Robertson, Edward L.	Com.	Fr.	Portland
Robertson, Mary Catherine	H. E.	Jr.	Portland
Robinson, Edna Aletha	H. E.	Fr.	Coquille
Robinson, Edward I.	Chem. E.	Spec.	Canton, Ohio
Robinson, Elise Daphne	Opt.		Cambridge, Idaho
Robinson, George Vinton	C. E.	Jr.	Forest Grove
Roche, Chester	Agri.	Soph.	Brownsville
Rodolf, Carl F.	C. E.	Fr.	Corvallis
Roehrig, Stewart	E. E.	Fr.	Pasadena, Calif.
Rogers, Lavina A.	Com.	Fr.	Portland
Rogers, Lucy Elizabeth	H. E.	Fr.	Corvallis
Rogers, Margaret	Com.	Fr.	Berkeley, Calif.
Rogers, Mary Alice	H. E.	Sr.	Corvallis
Rood, Marjorie L.	Com.	Fr.	Portland
Rose, Charles Duncan	Agri.	Soph.	Seattle, Wash.
Roseman, Arthur Mills	Agri.	Jr.	Dayton
Rosen, Morris	Agri.	Fr.	Los Angeles, Calif.
Ross, Linden N.	Agri.	Jr.	Los Angeles, Calif.

Name	Course	Rank	Home Address
Ross, Frank E.....	Min.	Soph.	Central Point
Ross, Lucile.....	H. E.	Soph.	Eugene
Rotschy, Henry.....	Agri.	Voc.	Yacolt, Wash.
Routledge, Ruth Adeline.....	Opt.		Portland
Row, A. Narayana.....	Com.	Sr.	Kudaravalli, India
Rowe, Harry John.....	E. E.	Spec.	Goodland, Kan.
Ruegg, Pearle Marie.....	Com.	Fr.	Gresham
Runyan, Wilbur Arthur.....	C. E.	Sr.	Portland
Rundell, Hugh Dean.....	M. E.	Jr.	Newberg
Russell, Carl.....	E. E.	Fr.	Sweet Home
Russell, Charles Joseph.....	Agri.	Soph.	Pendleton
Russell, Frank Leitch.....	For.	Jr.	Portland
Russell, John Robert.....	Agri.	Fr.	Portland
Rycraft, Forest Vernon.....	Agri.	Fr.	Corvallis
Rydberg, Iver Louis.....	Agri.	Fr.	San Diego, Calif.
Sabin, Lynn Platt.....	Com.	Soph.	Grants Pass
Salisbury, Arthur Cole.....	M. E.	Fr.	Turner
Samuelson, Oliver Lorenzo.....	Agri.	Spec.	Brownsville
Sanborn, Lynn Durrell.....	Agri.	Soph.	Los Angeles, Calif.
Sandon, Grace Rea.....	Com.	Fr.	Corvallis
Sandon, Helen Beatrice.....	H. E.	Jr.	Corvallis
Sanford, Ida C.....	Com.	Spec.	Fairport, Calif.
Sappington, Mrs. Kate Kelly.....	Com.	Spec.	Corvallis
Sarna, Sajjan S.....	Agri.	Soph.	Rawal Pindi City, India
Saunders, Edward Towle.....	Hi. E.	Jr.	Portland
Saunders, Esther Blanche.....	Com.	Fr.	Richland
Saunders, Laurence Henry.....	Agri.	Fr.	El Cajon, Calif.
Saunders, Lida Jane.....	Opt.		Richland
Saunders, Mabel Edna.....	Opt.		Richland
Sawyer, Doris.....	H. E.	Sr.	Salem
Sawyers, Ruth Leona.....	H. E.	Soph.	Santa Barbara, Calif.
Say, John McDonald.....	Agri.	Voc.	Sherwood
Scea, Helen Lenore.....	H. E.	Soph.	Milton
Scea, Paul Wildie.....	Com.	Soph.	Milton
Schiewe, Ben Nathan.....	M. E.	Fr.	Portland
Schmidt, Martha Selma.....	Com.	Spec.	Corvallis
Schminky, Harold Bruce.....	Hi. E.	Soph.	Eagle Creek
Schoren, Helen Margaret.....	Com.	Fr.	The Dalles
Schoth, Albert Joseph.....	Agri.	Sr.	Oregon City
Schott, Rena.....	H. E.	Sr.	Salem
Schreiber, Esther Louise.....	H. E.	Jr.	Chanton, Iowa
Schubert, Placidus James.....	E. E.	Fr.	Corvallis
Schutt, Marjorie Laura.....	H. E.	Soph.	Corvallis
Schwarz, George M.....	E. E.	Jr.	Portland
Schwarz, Sigmund C.....	Chem. E.	Soph.	Portland
Scott, Albert Miles.....	Agri.	Jr.	Ada
Scott, Elmer Riggs.....	Agri.	Soph.	Ada
Scott, Jennie Ritchie.....	Com.	Spec.	Corvallis
Scott, Mary Ritchie.....	Agri.	Spec.	Corvallis
Scotton, Edwin B.....	E. E.	Fr.	Portland

Name	Course	Rank	Home Address
Scritsmier, Lester Jake.....	Com.	Fr.	Long Beach, Calif.
Seavey, Grace.....	Com.	Spec.	Port Townsend, Wash.
Sebo, Clarence.....	Agri.	Soph.	Silverton
Seibert, Emil.....	Com.	Soph.	Pendleton
Seidl, Albert Carl.....	Com.	Fr.	Troutdale
Seifert, Lucille Caroline.....	H. E.	Fr.	Roy, Wash.
Sein, Walterio M.....	Agri.	Soph.	Los Angeles, Calif.
Seley, Frances Mariam.....	H. E.	Soph.	Portland
Selover, Eleanor Marie.....	H. E.	Jr.	Ignacio, Colo.
Selph, Raymond G.....	Agri.	Sr.	Los Angeles, Calif.
Serier, Edith Ann.....	Phar.	Fr.	Washtucna, Wash.
Sevilla, Diego A.....	E. E.	Fr.	San Isidro, P. I.
Shafer, Carl Balford.....	I. A.	Voc.	Seneca, Mo.
Shake, Helen Frances.....	Com.	Fr.	Payette, Idaho
Shank, Earl Henry.....	C. E.	Fr.	Hood River
Shank, Ernest Elam.....	Com.	Spec.	Hood River
Sharkey, Clement J.....	Min.	Fr.	Portland
Shaver, Leonard R.....	Com.	Jr.	Portland
Shaver, Ralph Thomas.....	E. E.	Fr.	Sutherlin
Shaver, Zela.....	H. E.	Spec.	Molalla
Shaw, Helen.....	H. E.	Fr.	Harley, Idaho
Shaw, Ralph Fred.....	Agri.	Sr.	Portland
Shea, Esther E.....	H. E.	Soph.	Portland
Shedd, Bertha Lucille.....	H. E.	Sr.	Shedd
Sheffield, Frank Brizee.....	For.	Soph.	Newport
Shelley, Marjorie.....	H. E.	Soph.	Everett, Wash.
Shelton, Wilbur W.....	Com.	Soph.	Pomeroy, Wash.
Shen, Peng Fei.....	For.	Soph.	Washington, D. C.
Sheppard, W. O.....	Com.	Jr.	Hood River
Sherfy, Harold E.....	Agri.	Fr.	Lebanon
Sherfy, Vest E.....	H. E.	Fr.	Lebanon
Shirley, Marguerite.....	Com.	Fr.	Weiser, Idaho
Shopp, Marie Louise.....	Com.	Fr.	Orchards, Wash.
Short, E. Francis.....	Com.	Soph.	Long Beach, Calif.
Shotwell, Jesse Gordon.....	Hi. E.	Soph.	Hermiston
Sias, Salome.....	Phar.	Fr.	Forest Grove
Simpson, Charles Eldon.....	Com.	Soph.	Carrolls, Wash.
Sinks, Lenora D.....	H. E.	Soph.	Portland
Sinner, Henry.....	Agri.	Voc.	Kalama, Wash.
Skelton, Joe Taff.....	Chem. E.	Fr.	Corvallis
Skidmore, Maude M.....	H. E.	Sr.	Curtin
Skinner, Ruby Aileen.....	Com.	Spec.	Jordan Valley
Skinner, Verne Claire.....	H. E.	Voc.	Jordan Valley
Skov, Maren Julia.....	H. E.	Fr.	Ferndale, Calif.
Slater, Richard T.....	Com.	Fr.	Sutherlin
Slayton, Mabel Adaline.....	H. E.	Jr.	Prineville
Slayton, Mildred Lura.....	H. E.	Jr.	Prineville
Smiley, Frank B.....	Agri.	Fr.	Independence
Smiley, James Ray.....	E. E.	Soph.	Corvallis
Smith, Aaron Johnson.....	C. E.	Soph.	Long Beach, Calif.
Smith, Cecil Starr.....	For.	Soph.	Portland

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Smith, Elizabeth Frances.....	Com.	Soph.	Portland
Smith, Elva L.....	H. E.	Sr.	Portland
Smith, Everett Lathrop.....	Agri.	Soph.	Pasadena, Calif.
Smith, Floyd Arthur.....	E. E.	Soph.	Lakeview
Smith, Grace Elizabeth.....	H. E.	Soph.	Portland
Smith, Hiram Chester.....	I. A.	Sr.	Kansas
Smith, Janie Vivian.....	Com.	Fr.	Medford
Smith, Leon Adell.....	H. E.	Sr.	Carnation
Smith, Lewis.....	E. E.	Fr.	Missoula, Mont.
Smith, Sterling William.....	E. E.	Soph.	Portland
Smith, Thomas Willis.....	Agri.	Fr.	Claremont, Calif.
Smith, Virginia Middleton.....	H. E.	Fr.	Ontario
Smith, Wallace W.....	Agri.	Jr.	Marsovan, Turkey
Smith, Wilbur Joseph.....	M. E.	Soph.	Rainier
Snall, Caralie Alice.....	For.	Spec.	Astoria
Snowberg, Fred T.....	Phar.	Sr.	Warren, Ind.
Soderstrom, Victoria.....	H. E.	Jr.	Halsey
South, Lawrance G.....	M. E.	Fr.	Pendleton
Southern, Raymond D.....	Chem. E.	Soph.	Halsey
Spain, Gail Elliot.....	M. E.	Soph.	Portland
Spamer, Elsie Josephine.....	H. E.	Fr.	Beaverton
Sparks, Irene Louise.....	H. E.	Spec.	Medicine Lodge, Kan.
Specht, Mabel.....	H. E.	Soph.	Portland
Spicer, Bertie W.....	Agri.	Fr.	Alturas, Calif.
Spengler, Carl Jacob.....	Com.	Fr.	Great Falls, Mont.
Spika, Edwin Axtel.....	Phar.	Spec.	Grand Junction, Colo.
Spires, Elton C.....	Agri.	Soph.	Myrtle Point
Spires, Roy L.....	C. E.	Soph.	Myrtle Point
Spitzbart, Esther Barbara.....	Com.	Fr.	Salem
Spitzbart, Freda Georgene.....	Com.	Soph.	Salem
Spitzbart, Leo George.....	Agri.	Fr.	Salem
Spriggs, Glenn E.....	Com.	Fr.	Medford
Spriggs, James Llewellyn.....	Agri.	Jr.	Medford
Staats, Ben Chester.....	Agri.	Fr.	Portland
Staats, Vere Leslie.....	Phar.	Soph.	Airlie
Staff, Selma Josephine.....	H. E.	Fr.	Kelso, Wash.
Staiger, Guy A.....	Phar.	Jr.	Corvallis
Stansbery, Edgar Harlan.....	Agri.	Fr.	Portland
Stanton, Richard Edwin.....	M. E.	Fr.	Portland
Stark, Leslie M.....	Com.	Sr.	Holrege, Neb.
Stearns, Emel Everett.....	M. E.	Fr.	Klamath Falls
Stearns, Val M.....	Agri.	Fr.	Los Angeles, Calif.
Steele, Isabelle Alice.....	H. E.	Soph.	Portland
Steel, Joseph Irvine.....	For.	Soph.	Portland
Steele, Ruth.....	H. E.	Soph.	Creswell
Stegerwald, Andrew.....	Opt.		Corvallis
Stelling, John Lloyd.....	Agri.	Jr.	San Jose, Calif.
Stephenson, Mervin.....	Hi. E.	Jr.	Condon
Steusloff, Claude H.....	Agri.	Jr.	Salem
Steward, Albert N.....	Agri.	Soph.	Omak, Wash.
Stewart, Harry J.....	Agri.	Jr.	Portland

Name	Course	Rank	Home Address
Stewart, Irene.....	Com.	Fr.	Aurora
Stewart, James Ivan.....	Com.	Soph.	Fossil
Stewart, James Oscar.....	Agri.	Jr.	Medford
Stewart, Robert Alexander.....	Agri.	Soph.	Portland
Stewart, Ruth M.....	H. E.	Soph.	Portland
Stimpson, Etta Lorene.....	H. E.	Jr.	Corvallis
Stimson, William Henry.....	M. A.	Voc.	Medford
Stone, Archie Edward.....	M. E.	Soph.	Rockford, Ill.
Stone, Erwin Patton.....	Phar.	Soph.	Maynardville, Tenn.
Stone, Herman Al.....	Agri.	Sr.	Woodburn
Stow, William Raymond.....	Agri.	Sr.	Corvallis
Strain, Hazel Marie.....	H. E.	Fr.	Pendleton
Strain, Stephanie.....	H. E.	Soph.	Portland
Strahl, Newton Fenton.....	Com.	Soph.	Centerville, Wash.
Strange, Rose.....	Phar.	Spec.	Vancouver, Wash.
Stratton, Lorena Alberta.....	H. E.	Fr.	Medford
Straughn, Orson L.....	Agri.	Sr.	Pendleton
Strief, Hazel Jean.....	H. E.	Soph.	Portland
Strome, Glenn Smyth.....	Agri.	Sr.	Eugene
Strome, Katherine.....	H. E.	Jr.	Junction City
Strong, Charles Wesley.....	Com.	Soph.	Monmouth
Strong, Ralph L.....	Chem. E.	Fr.	Elk City, Idaho
Strout, Eugene Lucas.....	Com.	Fr.	Amity
Stuart, Donald Bruce.....	E. E.	Soph.	
Stuart, George A.....	Com.	Fr.	Latourelle
Stuart, Ray T.....	M. E.	Fr.	Nampa, Idaho
Sturchler, Martha.....	H. E.	Jr.	Cleveland, Ohio
Stutz, Lelia B.....	H. E.	Soph.	Corvallis
Sutton, Lee.....	Agri.	Spec.	Aumsville
Svenson, Lynette Joyce.....	Com.	Fr.	Astoria
Swaggerty, James G.....	M. E.	Soph.	Salem
Swan, Grant.....	C. E.	Fr.	Los Angeles
Swan, Harry T.....	Min.	Soph.	Baker
Swearingen, Winifred.....	H. E.	Fr.	Toledo
Sweeney, Elynore Dorothea.....	Com.	Soph.	Walla Walla, Wash.
Sweeney, Philip Brooks.....	Agri.	Jr.	Walla Walla, Wash.
Tadlock, Marion C.....	Chem. E.	Fr.	Raymond, Wash.
Tait, John David.....	E. E.	Soph.	Corvallis
Tate, Aileen.....	Com.	Spec.	Wasco.
Taylor, Frances Beryl.....	Opt.		Hollister, Calif.
Taylor, Fred A.....	Com.	Soph.	Medford
Taylor, Hugh L.....	Agri.	Fr.	Corvallis
Taylor, Gladys Cooke.....	H. E.	Fr.	La Grande
Taylor, Kenneth Somers.....	Agri.	Soph.	Glendale, Calif.
Taylor, Stephen Leonard.....	Agri.	Fr.	San Dimas, Calif.
Teague, Hazel Belle.....	H. E.	Spec.	Pomona, Calif.
Teler, Harry Clarence.....	C. E.	Fr.	Portland
Tensen, Klaus.....	Agri.	Voc.	Ontario
Terada, Yoshio.....	Agri.	Fr.	Honolulu, T. H.
Teutsch, William Leroy.....	Agri.	Soph.	Nyssa
Thayer, Jessie.....	Phar.	Sr.	Rainier

Name	Course	Rank	Home Address
Thayer, Hugh Otis.....	Agri.	Spec.	Vale
Thomas, Marvin.....	Agri.	Soph.	Alhambra, Calif.
Thomas, Seymour.....	Agri.	Soph.	Denver, Colo.
Thompson, Benjamin Garrison.....	Agri.	Jr.	Shedd
Thompson, Cecil A.....	Agri.	Sr.	Portland
Thompson, Ella Margaret.....	Opt.		Corvallis
Thompson, Hal Emerson.....	Com.	Fr.	Falls City
Thompson, Josephine Sophia.....	Com.	Soph.	Seaside
Thompson, Josephine M.....	Com.	Spec.	Portland
Thompson, Kirk.....	M. E.	Fr.	Portland
Thompson, Leslie Rae.....	M. E.	Fr.	Island City
Thoms, Harold W.....	Min.	Sr.	Scio
Thomson, Stanley Aaron.....	Phar.	Soph.	Junction City
Throne, Thelma Louise.....	H. E.	Fr.	Corvallis
Tilden, Howard.....	M. E.	Fr.	Nehalem
Tilley, George S.....	Agri.	Spec.	Seattle, Wash.
Tilton, Arthur James.....	Agri.	Jr.	Portland
Toliver, Marion Earl.....	Agri.	Fr.	Molalla
Tolls, Leveritt Joseph.....	Com.	Soph.	Portland
Tomkins, Clarence.....	E. E.	Fr.	Corvallis
Towle, Florence.....	H. E.	Fr.	Portland
Townsend, Annie.....	H. E.	Fr.	Corvallis
Tromp, Anna Belle Agnes.....	H. E.	Jr.	Ferndale, Wash.
Truesdale, Charles M.....	Agri.	Jr.	Redlands, Calif.
Turner, Marguerite E.....	Com.	Soph.	Medical Springs
Turner, Maynard Ede.....	Agri.	Fr.	Pasadena, Calif.
Tuthill, Lewis H.....	Hi. E.	Soph.	Sutherlin
Tweed, Catherine.....	H. E.	Jr.	Corvallis
Tyrrel, Claude Alonzo.....	Agri.	Jr.	Alhambra, Calif.
Underwood, Joseph M.....	Min.	Sr.	Pasadena, Calif.
Upcroft, Winfield Scott.....	Com.	Fr.	Vandergrift, Pa.
Ure, Ray Elwin.....	Agri.	Spec.	Portland
U'Ren, Muriel Elizabeth.....	H. E.	Fr.	Portland
Van Hine, Jacob Cornelius.....	Com.	Spec.	Corvallis
Van Luven, Donald E.....	Agri.	Fr.	Colton, Calif.
Vannice, Thomas Keifer.....	I. A.	Soph.	Corvallis
Van Tassel, Harriet.....	Opt.		Albany
Van Winkle, Dorothy Charlotte.....	Com.	Soph.	Spokane, Wash.
Van Wyngarden, Ben.....	Com.	Fr.	Portland
Versteeg, Ray Marion.....	M. E.	Fr.	Portland
Vestal, James Fenix.....	I. A.	Jr.	Eagle Point
Vierhus, Albert Victor.....	Min.	Jr.	Oregon City
Vihari, Ambalal J.....	Com.	Sr.	Baroda, India
Vincent, Hazel Margaret.....	H. E.	Jr.	Vici, Okla.
Von Lehe, Agnes Pauline.....	H. E.	Fr.	Philomath
Von Lehe, Erma Magadeline.....	H. E.	Fr.	Philomath
Voruz, Ruth.....	H. E.	Jr.	Baker
Wade, Ellen Claire.....	Com.	Fr.	Clem
Wade, Wythel.....	H. E.	Fr.	Island City
Wagner, Henrietta.....	H. E.	Sr.	Laurel, Ind.
Wagner, Laura Ethel.....	H. E.	Spec.	Salem

Name	Course	Rank	Home Address
Wait, George N.	I. A.	Fr.	Canby
Waite, Katherine Douglas	Phar.	Jr.	Roseburg
Wakefield, Harold Smith	Agri.	Fr.	Fresno, Calif.
Walker, Ethel Elaine	H. E.	Jr.	Philomath
Walker, James Douglas	Phar.	Fr.	Salem
Walker, Ozbun G.	Com.	Fr.	Portland
Walker, Robert Edwin	Com.	Soph.	Mancos, Colo.
Wall, Millicent	Com.	Fr.	Portland
Walpole, John Kenneth	Agri.	Fr.	Portland
Walsted, John Palmer	Chem. E.	Fr.	Portland
Walter, Glenn Franklin	Com.	Voc.	Portland
Walters, Frances	Com.	Soph.	Corvallis
Ward, Lillian Alice	H. E.	Soph.	Portland
Warman, Grace Anna	H. E.	Spec.	Corvallis
Warnick, Irma A.	Com.	Voc.	Wedderburn
Warrens, Robert Hewett	Agri.	Fr.	Hillsdale
Washburn, Harry Lee	Agri.	Voc.	Washington, D. C.
Watenpugh, Rolland V.	Com.	Jr.	Ontario, Calif.
Waterman, Crawford Burbank	Opt.		Los Angeles, Calif.
Waterman, Ellsworth Yale	Agri.	Fr.	San Leandro, Calif.
Waterman, Whitney	Agri.	Jr.	Pasadena, Calif.
Watkins, Harold H.	Agri.	Fr.	Kalama, Wash.
Watt, Bertha J.	Com.	Fr.	Portland
Watt, Robert Henry	Agri.	Soph.	Bay City
Watson, Margaret B.	Com.	Fr.	Corvallis
Watson, Stanley Everett	Min.	Fr.	Hillsboro
Waugh, Robert Walter	C. E.	Fr.	Hood River
Weatherspoon, Froma B.	H. E.	Voc.	Elgin
Webber, Charles H.	Agri.	Fr.	Portland
Weber, Georgia Muriel	H. E.	Fr.	Halsey
Weber, Richard M.	Agri.	Jr.	Hood River
Webster, Earl	Agri.	Soph.	Portland
Webster, Robert Millard	I. E.	Soph.	Milford, Utah
Weed, Wilbur M.	Agri.	Fr.	Beaverton
Weidenheimer, Norman William	Min.	Fr.	Corvallis
Weisenborn, Henry William	Com.	Fr.	Portland
Weller, George C.	C. E.	Fr.	Salem
Wellman, Harrison Richard	M. E.	Soph.	Freewater
Wells, Lizzie	Com.	Sp.	Buena Vista
Wells, Orville George	Agri.	Fr.	Independence
Wells, Theodosia Violet	Com.	Fr.	Ontario
Werth, Conrad Walter	E. E.	Sr.	Portland
West, A. Flavius	Com.	Soph.	Portland
West, George G.	C. E.	Fr.	Portland
West, Marion Lou	H. E.	Soph.	Portland
Westgate, Alfred Marion	Com.	Voc.	Pilot Rock
Whaley, Mamie	H. E.	Spec.	Corvallis
Wheeler, Ethel Cusick	H. E.	Fr.	Portland
Wheeler, Eva May	H. E.	Soph.	Tillamook
Wheeler, Helen Pierce	H. E.	Soph.	Portland
Whillock, Bertha Alice	Com.	Sr.	Medford

UNDERGRADUATE STUDENTS

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Name	Course	Rank	Home Address
Whipple, Hazel.....	Com.	Fr.	Corvallis
Whitaker, Leslie C.....	Agri.	Jr.	Sacramento, Calif.
Whitaker, Richard M.....	Agri.	Spec.	Seaside
Whitaker, William Carey.....	Agri.	Fr.	Sacramento, Calif.
White, Harold H.....	Agri.	Soph.	Kerby
Whitmore, Rodney M.....	Com.	Spec.	Mayfield, Pa.
Whitted, Floyd C.....	Phar.	Fr.	San Dimas, Calif.
Whittlesey, Roland D.....	Min.	Fr.	Philomath
Widby, Arthur B.....	Agri.	Fr.	Myrtle Point
Wieman, John Samuel.....	Agri.	Sr.	Los Angeles, Calif.
Wilber, Howard Earl.....	Agri.	Soph.	Long Beach, Calif.
Wilde, Cora.....	Com.	Soph.	Junction City
Wiles, Clarence E.....	Agri.	Fr.	Albany
Wilhelm, Roger Jesse.....	Phar.	Spec.	The Dalles
Wilkes, Elinor.....	Opt.		Corvallis
Wilks, L. Raymond.....	Agri.	Soph.	Helix
Willert, Floyd B.....	For.	Fr.	Corvallis
Willoughby, Ralph S.....	Agri.	Soph.	Harrisburg
Willmot, Richard K.....	For.	Sr.	Portland
Wilt, Clarence Oliver.....	M. E.	Fr.	Corvallis
Williams, Carl Alfred.....	Com.	Soph.	Alpine
Williams, Charles Walter.....	Agri.	Jr.	Corvallis
Williams, E. Dan.....	Log. E.	Fr.	Portland
Williams, James Wayne.....	Log. E.	Soph.	Portland
Williams, Richard C.....	Agri.	Sr.	Hillsboro
Williams, Richard Hipsley.....	Agri.	Jr.	Dillon, Mont.
Williams, Sumner W.....	For.	Soph.	Glendale
Williams, Wendell.....	Agri.	Voc.	Junction City
Williamson, Fred Nelson.....	Agri.	Fr.	Yachats
Williamson, Loma Emma.....	H. E.	Soph.	Corvallis
Williamson, Martha Jane.....	H. E.	Jr.	Corvallis
Wilson, Ernest Hester.....	E. E.	Fr.	The Dalles
Wilson, Frank Edwin.....	C. E.	Fr.	Mosier
Wilson, Otis Estee.....	M. E.	Jr.	Salem
Wilson, Stella Nora.....	H. E.	Jr.	Burns
Winter, T. A.....	Agri.	Jr.	Los Angeles, Calif.
Wise, Zena Alex.....	M. E.	Fr.	Portland
Wiseman, Daisy Evolene.....	H. E.	Soph.	Huston, Texas
Wiseman, Edna Mary.....	Com.	Spec.	Naches, Wash.
Wissinger, Dorothy S.....	Com.	Fr.	Milwaukie
Witt, Eric William.....	Agri.	Soph.	Portland
Wittliff, John Allen.....	E. E.	Fr.	The Dalles
Wolff, Ruth E.....	Phar.	Fr.	Portland
Wood, LeVelle.....	H. E.	Fr.	Corvallis
Wood, Rowena Adelaide.....	Opt.		Arlington
Woodcock, Arthur James.....	Phar.	Sr.	Portland
Woodham, Edna Clara.....	H. E.	Voc.	Corvallis
Woodham, Harry C.....	Agri.	Spec.	Albion, Ill.
Woodsum, Edna May.....	H. E.	Jr.	Corvallis
Woodward, Mary.....	H. E.	Fr.	Portland
Worley, Stanley.....	Agri.	Sr.	San Francisco, Calif.

Name	Course	Rank	Home Address
Wright, Blanche Ellen.....	H. E.	Soph.	Brownsville
Wright, Gill Cowan.....	Agri.	Spec.	Richland
Wright, Marshall Simpson.....	Agri.	Jr.	Sierra Madre, Calif.
Wright, William SoRelle.....	Agri.	Sr.	San Gabriel, Calif.
Yamamota, Francis Y.....	E. E.	Sr.	Seattle, Wash.
Yates, Eva.....	H. E.	Sr.	Corvallis
Yates, Irma.....	Com.	Fr.	Corvallis
Yeatman, Irene Estelle.....	H. E.	Soph.	Oakland, Calif.
Yexley, Lyle Marion.....	H. E.	Fr.	Oregon City
Yexley, Myrtle Allen.....	H. E.	Fr.	Oregon City
Young, Garth Lylle.....	M. E.	Fr.	Portland
Young, Hubbell.....	Agri.	Spec.	Tangent
Young, William John.....	M. E.	Fr.	Portland
Young, William Nelson.....	Agri.	Fr.	Seattle
Zan, Regina.....	H. E.	Spec.	Portland
Ziegler, E. Augusta.....	Com.	Fr.	Portland
Ziegler, Helen Marie.....	H. E.	Jr.	White Salmon, Wash.
Ziegler, Laura Elizabeth.....	Phar.	Jr.	White Salmon, Wash.
Zimmerhahle, Frank.....	I. A.	Fr.	Clatskanie

SUMMER SCHOOL STUDENTS

Absher, Albert	I. A.	Corvallis
Adams, M. Etta	H. E.	Corvallis
Ahnert, Mollie	Coll.	Eagle Creek
Alder, Frank William	I. A.	Oakland, Calif.
Alexander, Marjorie	H. E.	Salem
Alexander, Ruby	H. E.	McMinnville
Allinger, H. W.	Coll.	The Dalles
Amesbury, Ruth	H. E.	Portland
Amonino, Anthony B.	I. A.	Negaunee, Mich.
Anderson, Ellen	H. E.	Portland
Andrews, Abbie	H. E.	Corvallis
Andrews, Marguerite	Phys. Ed.	Corvallis
Andrews, Marie	Com.	Corvallis
Anthony, Marie	H. E.	Albany
Ariss, Dorothy	H. E.	Portland
Axtell, Edward G.	I. A.	Corvallis
Bair, Ray Elman	I. A.	Fossil
Banton, Lillian Louella	Music	Bellfountain
BaRee, Edith A.	H. E.	Eugene
Bartlett, Ellen M.	Spec.	San Francisco, Calif.
Bechen, Ella	Phys. Ed.	Hillsboro
Bechen, Esther	Phys. Ed.	Hillsboro
Bechen, Martha	H. E.	Hillsboro
Beers, Ruby	H. E.	Corvallis
Benson, Mrs. Orpah	H. E.	Cottage Grove
Berchtold, Florence	Music	Corvallis
Betterson, Mrs. Sophia W.	H. E.	Portland
Biddle, Gladys	H. E.	LaFayette
Birch, Garcia	H. E.	Corvallis
Black, Verena	H. E.	Eugene
Boies, Isaac	Spec.	Regina, Canada
Booth, Bertha M.	H. E.	Madras
Bowden, Florence	Phys. Ed.	Corvallis
Bowerman, Mrs. E.	Coll.	Fossil
Bradley, Pearl	H. E.	Corvallis
Bruce, Louise	Phys. Ed.	Portland
Brumbaugh, Madeline	Com.	Corvallis
Buchanan, Fred H.	I. A.	McMinnville
Buell, Bartholomew	Coll.	Corvallis
Burnap, Florence	H. E.	Corvallis
Burton, Mrs.	Music	Corvallis
Caldwell, Katharine	H. E.	Artesia, Calif.
Carlson, Arthur A.	I. A.	Portland
Case, Ruth E.	Coll.	Kalama, Wash.
Castle, Carrie E.	H. E.	Berkeley, Calif.
Chalker, Mrs. Estella	H. E.	Portland
Childs, Grace	H. E.	Redlands, Calif.
Chute, Freeman G.	I. A.	Bellingham, Wash.
Chute, Mrs. F. G.	H. E.	Bellingham, Wash.

Name	Course	Home Address
Clark, Doris A.	Coll.	Portland
Clausmeyer, Blanch M.	Phys. Ed.	Corvallis
Cochrane, Adona	Coll.	Salem
Cochrane, Isabelle	Com.	Corvallis
Cofer, Effie E.	Coll.	Corvallis
Coffman, Orville W.	Spec.	Pendleton
Cohoon, W. C.	Coll.	Hood River
Cooper, Altha	Coll.	Corvallis
Corbett, Jessie	H. E.	Corvallis
Corbett, Ruth	Spec.	Corvallis
Covell, Margaret	Art	Corvallis
Cramer, Rae L.	Music	Corvallis
Cunningham, Bessie A.	Phys. Ed.	Woodburn
Currin, Linnie E.	H. E.	Corvallis
Daugherty, Otis Ray	Spec.	Molalla
Dawson, Anna	Coll.	Albany
Deming, Edna	H. E.	Healdsburg, Calif.
Deierlein, Gertrude	H. E.	Eugene
Denniston, Audrey	Com.	McMinnville
Denniston, Laneta	H. E.	McMinnville
Dietsch, F. J.	Spec.	Days Creek
Dillon, Martha E.	Coll.	Portland
Doolittle, Lydia	H. E.	Corvallis
Doolittle, Maida E.	Coll.	Wallowa
Dougherty, Avis F.	Coll.	Portland
Dyson, Lizzie	Coll.	Dahlia, Wash.
Eagy, Clarence H.	Com.	Albany
Eakins, Jack M.	Com.	South Pasadena, Calif.
Edwards, Bertha M.	H. E.	Monroe
Empo, Estella	Coll.	Blind Slough
Ericson, L. J.	I. A.	Bellingham, Wash.
Ericson, Mrs. L. J.	H. E.	Corvallis
Everton, Ada	Com.	Grants Pass
Fawcett, Hazel	Coll.	Coquille
Fegley, Pearl S.	Coll.	Corvallis
Feike, Zelta F.	H. E.	Portland
Ferguson, Alice	Coll.	Helix
Fiedler, Elizabeth	Coll.	Corvallis
Fischer, W. C.	Spec.	Yaquina
Flint, Mrs. Marie A.	H. E.	Roseburg
Forest, Bernice	H. E.	Eugene
Fox, Otto L.	I. A.	Albany
Freyler, Edna	Com.	Corvallis
Fridley, Dora A.	Coll.	Klondike
Fulton, Helen Louise	Art	Corvallis
Funk, Vera	Com.	Corvallis
Gardner, Helen	Coll.	Metzger
Gartin, L. E.	Spec.	Portland
Gates, Pearl	H. E.	Corvallis
Gilmore, Mrs. W. J.	Coll.	Corvallis
Glines, Ione	H. E.	Waldport

Name	Course	Home Address
Glaser, Elizabeth	H. E.	Lebanon
Goble, R. E.	I. A.	Ferndale, Calif.
Golden, Zoe	H. E.	Corvallis
Gould, Lois	Phys. Ed.	Corvallis
Gray, Mattie E.	H. E.	Corvallis
Guthrie, Jane	Coll.	Corvallis
Hall, George J.	Coll.	Cottage Grove
Hall, Mildred A.	Com.	Corvallis
Hall, Phila H.	H. E.	Fairfax, Vermont
Hammond, Josephine	Coll.	Silverton
Hanthorn, Faith	Coll.	Portland
Hardie, Jessie M.	I. A.	Condon
Hargrove, Vivian	Coll.	Corvallis
Harris, Edna	Coll.	Fruitland, Idaho
Harrison, Allen	I. A.	Brownsville
Harrison, Evandne	Coll.	Portland
Hazelton, Blanche M.	Coll.	Amesbury, Mass.
Hedlund, Clara	H. E.	Portland
Hequidt, G. B.	Spec.	Portland
Heller, Anna E.	H. E.	Spokane, Wash.
Hembling, Grace	Com.	Corvallis
Hicks, Hazel Ione	Coll.	Weiser, Idaho
Hicks, Roy A.	I. A.	San Jose, Calif.
Hilde, Tillie	Coll.	Fort Ranson, N. D.
Hill, Glenn H.	I. A.	Santa Clara, Calif.
Holway, Alma C.	H. E.	Portland
Holway, Charles	I. A.	Portland
Homes, Susan W.	H. E.	Ashland
Hopkins, Ethel	Coll.	Corvallis
Horner, Pearl	H. E.	Corvallis
Houck, E. L.	Spec.	McMinnville
Howard, Mrs. R. M.	H. E.	Corvallis
Howey, Iva M.	Coll.	Corvallis
Hurd, G. Lansing	Spec.	Portland
Hurd, Sylvia Belle	Coll.	Medford
Jackson, Eva I.	H. E.	Portland
Jackson, Mildred M.	Coll.	Corvallis
Jewett, Howard P.	Coll.	Salem
Johnson, Ruth A.	Coll.	Astoria
Johnston, Jane Agnes	H. E.	Corvallis
Jones, Edith	Coll.	Lynn, Ind.
Jones, Margaret	Phys. Ed.	Corvallis
Jordon, Marvin	I. A.	Corvallis
Joseph, Retta E.	Com.	Philomath
Kalbus, Helen	Coll.	Chehalis, Wash.
Kellogg, C. M.	Spec.	Corvallis
Kennard, Bess	Coll.	Santa Rosa, Calif.
Kennard, Ella	Coll.	Santa Rosa, Calif.
Kennedy, Ruth	Coll.	Corvallis
Kenny, Dora	Coll.	Portland
Kimmall, Walter Wm.	I. A.	Lebanon

Name	Course	Home Address
Kirtley, Naomi	H. E.	La Grande
Klann, Ethel	H. E.	Madras
Knight, Frederick S.	Coll.	Forest Grove
Knowles, Inez	H. E.	Lebanon
Lamson, Maude E.	H. E.	Cottage Grove
Law, Mary Ellen	Coll.	Corvallis
Leeper, Enid	Coll.	Corvallis
Legge, Gladys	Coll.	Portland
Leland, A. E.	Spec.	Los Angeles, Calif.
Lent, May	H. E.	Spokane, Wash.
Lewis, Adele	Coll.	Corvallis
Lewis, J. M.	Coll.	Corvallis
Lindsay, Anne	H. E.	Corvallis
Lindsay, Edith	Coll.	Corvallis
Linville, Myrtle	Coll.	Astoria
Loftus, Wilhelmina	H. E.	Seattle
Love, Anis	Coll.	Junction City
Lundgren, Alice	H. E.	Corvallis
Lusian, Edith J.	H. E.	Spokane, Wash.
McAlroy, George Ernest	I. A.	Dixon, Calif.
McBride, Mildred	Coll.	Corvallis
McCain, Isle	H. E.	Jordan Valley
McClain, Oral	Com.	Salem
McCormick, Anna	H. E.	Lebanon
McCormick, H. C.	Coll.	Corvallis
McDonnell, Alice	Coll.	Jordan Valley
McDougal, Clyde	Coll.	Corvallis
McKibbin, Jennie	Coll.	Portland
McNeal, R. W.	Coll.	Corvallis
MacDonald, Helen	Meth.	Corvallis
Mack, Lawrence Wallace	I. A.	Dufur
Maginnis, Agnes J.	Coll.	Corvallis
Maginnis, Frances	Coll.	Corvallis
Marias, Jos. F.	Spec.	Astoria
Matheny, June	Art	Seattle, Wash.
May, Lulu	Coll.	Monkland
Meacham, Leta	H. E.	Weiser, Idaho
Mendenhall, Marie	H. E.	Everett, Wash.
Mentzer, Lottie	Spec.	Pendleton
Mettie, Zena	I. A.	Ukiah
Miller, Alice Ruth	H. E.	Corvallis
Miller, C. Eva	H. E.	Corvallis
Miller, Mrs. Ellen	H. E.	Portland
Miller, Emily M.	Coll.	Corvallis
Mitchell, Grace	H. E.	Medford
Moore, Genevieve	Phys. Ed.	Corvallis
Moore, Iva Grace	Com.	Corvallis
Moore, Myra	H. E.	Corvallis
Moore, Sam	Spec.	Corvallis
Morarity, May C.	Coll.	Portland
Morris, Blanche	H. E.	Tennant, Iowa

Name	Course	Home Address
Morrison, Ruth	Coll.	Hood River
Morton, Ruth	H. E.	White Salmon, Wash.
Munson, Robert Bliss	Coll.	Corvallis
Murphy, C. May	Coll.	Portland
Myers, Eva T.	Coll.	Winlock, Wash.
Nelson, Bessie A.	Coll.	Portland
Nelson, Charlotte Lewis	H. E.	Corvallis
Niblin, Amy	H. E.	Caldwell, Idaho.
Nichols, Ambrose R.	Spec.	Corvallis
Nichols, Ben H.	Com.	Corvallis
Nichols, Margaret	H. E.	Portland
Nisley, Barbara	Coll.	Portland
Norris, Rita	H. E.	Burley, Idaho
Norton, Lola	H. E.	Vacaville, Calif.
Norton, Mabel	H. E.	Vacaville, Calif.
Nunn, Jess	Com.	Corvallis
Nunn, Vera A.	H. E.	Corvallis
Olsen, Mette	H. E.	Eugene
Paine, Chas. L.	Com.	Caldwell, Idaho
Paine, Mary A.	H. E.	Caldwell, Idaho
Parker, Lorena A.	H. E.	Oregon City
Patton, Palmer	Coll.	Corvallis
Paterson, James L.	Spec.	Portland
Patey, Alice L.	H. E.	McMinnville
Patterson, Winfred E.	H. E.	Corvallis
Peterson, Ivy	Coll.	Beaverton
Pernot, Dorothy	Phys. Ed.	Corvallis
Pimm, Alice	Coll.	Philomath
Porter, Chas. E.	Spec.	Portland
Post, Velma B.	Coll.	Blachly
Potter, Marion K.	H. E.	Corvallis
Powell, W. S.	Spec.	Moro
Powers, Verne L.	Phys. Ed.	Corvallis
Prentiss, Sara	H. E.	Bay City
Price, Elise Groves	H. E.	Sifton, Wash.
Randall, Frank I.	Spec.	Portland
Rausch, Mary I.	Spec.	Seattle, Wash.
Redmond, Agnes	H. E.	Portland
Reed, Ada	H. E.	Portland
Reeves, Orville G.	I. A.	Corvallis
Reichart, Natalie	Coll.	Corvallis
Reiter, Mrs. Eva C.	Spec.	Corvallis
Ressler, Mrs. May Babbitt	Phys. Ed.	Corvallis
Rice, Gladys	Coll.	Corvallis
Richards, Lorena	H. E.	Corvallis
Rieben, George	I. A.	Banks
Rieben, Mrs. George	Phys. Ed.	Ferndale, Calif.
Robbins, G. W.	I. A.	Corvallis
Robertson, Etta	Phys. Ed.	Corvallis
Robey, Donald Leroy	Coll.	Eugene
Robinson, Edward	I. A.	Salem

Name	Course	Home Address
Rogers, Mary	H. E.	Corvallis
Row, A. N.	Coll.	Corvallis
Rugh, Irene	Coll.	Eugene
Ryder, Agnes	Coll.	Eugene
Samson, Mrs. Geo. R.	H. E.	Corvallis
Sanders, Frances	Com.	Moro
Sarna, S. S.	Com.	Corvallis
Sawyer, Doris M.	H. E.	Salem
Schott, Rena	H. E.	Salem
Schoeffel, Raymond L.	I. A.	Los Angeles, Calif.
Schrepel, Marie F.	Com.	Corvallis
Scott, Jennie	Phys. Ed.	Corvallis
Scott, Mary	Phys. Ed.	Corvallis
Searcy, Lula E.	Coll.	Condon
Settles, Miss O.	H. E.	Redlands, Calif.
Sexton, Ellen E.	H. E.	Stewart, Nev.
Shankland, Albert	I. A.	Kalispell, Mont.
Shattuck, Mrs.	Phys. Ed.	Corvallis
Shedd, Lucile	H. E.	Shedd
Shelley, Marjorie	H. E.	Everett, Wash.
Shelley, Nellie	I. A.	Merlin
Sherman, Mrs. E. D.	Coll.	Fargo, N. D.
Shrock, Fannye	H. E.	Spokane, Wash.
Shrode, Jettie	Coll.	Albany
Sias, Mary	Spec.	Forest Grove
Siemon, Lydia	H. E.	Bakersfield, Calif.
Simpson, Dorothy P.	H. E.	Corvallis
Skidmore, Maude	H. E.	Curtin
Skipton, Laurence	Com.	Corvallis
Slade, Beulah	Com.	Moscow, Idaho
Smith, Beryl	I. A.	San Jose, Calif.
Smith, Elva L.	Coll.	Portland
Smith, Grace	Phys. Ed.	Corvallis
Smith, J. W.	Spec.	Corvallis
Spalding, Anna	H. E.	Oakland, Calif.
Starr, Edna M.	Com.	Bandon
Starr, Wilda	Art	Floweree, Mont.
Stuart, George A.	Com.	Latourell Falls
Stewart, Ruth	Coll.	Portland
Stoneburg, Ada Ruth	H. E.	Corvallis
Stow, Mrs. Emma	H. E.	Corvallis
Stow, William R.	Coll.	Corvallis
Stowell, Mrs. G. E.	H. E.	Corvallis
Streiff, Rosine	H. E.	Hillsdale
Struble, Frank H.	I. A.	Corvallis
Swanton, Frank	Spec.	Astoria
Sykes, Nell	H. E.	Salem
Tamminen, Leander	I. A.	Portland
Taylor, Bessie E.	H. E.	Fargo, N. D.
Thayer, Jessie	H. E.	Rainier
Thompson, Ben G.	Coll.	Corvallis

Name	Course	Home Address
Thompson, Levant	I. A.	Regina, Canada
Turner, Arthur E.	I. A.	Corvallis
Turner, A. L.	H. E.	Centralia, Wash.
Turner, Winnifred	H. E.	Corvallis
Uddenberg, Aide	H. E.	Tacoma, Wash.
Vail, Nathan D.	Spec.	Seattle, Wash.
Vierhus, Mary	I. A.	Oregon City
Vincent, Hazel	H. E.	Mutual, Okla.
Virgil, Fannie E.	H. E.	Klamath Falls
Wagener, Jessie	Coll.	Portland
Wagner, Henrietta	H. E.	Laurel, Ind.
Warne, Clyde S.	I. A.	San Jose, Calif.
Weisenborn, Anna	H. E.	Portland
Weymouth, Blanche	Com.	San Francisco, Calif.
Wight, Howard M.	Coll.	Corvallis
Wildig, Sophia	H. E.	Corvallis
Wilkes, Elinor	Phys. Ed.	Corvallis
Williamson, D. N.	Spec.	Corvallis
Williamson, Loma	Art	Corvallis
Williamson, Martha	Coll.	Corvallis
Wiseman, Mrs. Edna	H. E.	North Yakima, Wash.
Withee, Mabel	I. A.	Jacksonville
Woollomes, Agnes	H. E.	Whittier, Calif.
Worker, May	Phys. Ed.	Corvallis
Yates, Eva	Coll.	Corvallis

SPECIAL MUSIC STUDENTS *

Name	Course	Home Address
Adams, Clara Elizabeth	Harmony	Corvallis
Ahern, Irene	Piano	Hugo
Allen, Mrs. L. J.	Piano	Corvallis
Bates, Margaret Kathryn	Piano	Corvallis
Bauer, Marian	Piano	Corvallis
Bedyink, John	Violin	Corvallis
Brumbaugh, Sheldon	Voice	Corvallis
Casteel, Edith Hazel	Voice	Yaquonia
Chambers, Bernice	Piano	Corvallis
Chambers, Paul King	Clarinet	Corvallis
Churchill, Frances M.	Voice	Corvallis
Cordley, Dorothea	Voice	Corvallis
Dallas, Ruey	Piano	Corvallis
Fisher, Mrs. Gertrude	Voice	Philomath
Fitts, Grace	Piano	Lebanon
Foster, Ada	Piano	Corvallis
Fox, Otto L.	Trombone	Albany
Fryder, Helen	Saxophone	Corvallis

* In addition the names listed here, approximately 200 regular students of the College whose names are listed elsewhere in the Catalogue took work in the School of Music.

Name	Course	Home Address
Gilmore, Faith	Voice	Corvallis
Goodman, Arlene Garratt	Piano	Corvallis
Graham, Willa	Saxaphone	Corvallis
Hall, Lester E.	Voice	Corvallis
Hall, Mildred A.	Piano	Corvallis
Hamlin, Lucile	Voice	Corvallis
Hanshaw, Aura	Violin	Corvallis
Hawk, Ira Ross	Piano	Corvallis
Heitmeyer, Paul	Piano	Albany
Hereth, Conrad	Voice	Corvallis
Jager, Ernest Erwin.....	Piano	Corvallis
Johnson, Orlo	Trombone	Corvallis
Kamrolz, Mrs. H. E.	Voice	Centerville, Wash.
Kerr, Marion	Violin	Corvallis
Kiger, Martha	Piano	Corvallis
Krueger, Clara M.	Piano	Corvallis
Kuhlman, Mrs.	Voice	Corvallis
McCoy, Harold A.	Trombone	Oakdale, Wash.
Patterson, Dean Joseph	Clarinet	Corvallis
Peil, Fay Elizabeth	Piano	Corvallis
Reid, Ronald Baltimore	Piano	Albany
Rosenbaum, Lydia	Piano	Philomath
Shattuck, Obil	Saxaphone	Corvallis
Smith, Eleanor	Piano	Corvallis
Smith, Mrs. Mason	Violin	Corvallis
Turner, Milo F.	Cornet	Corvallis
Vickers, Mrs. Louise M.	Piano	Corvallis
Watkins, Mrs.	Piano	Philomath
Whittemore, Hopewell	Piano and Violin.....	Corvallis
Whittemore, John	Piano and Clarinet.....	Corvallis

WINTER SHORT COURSE STUDENTS (1918)

Name	Home Address	Name	Home Address
Adams, Mrs. M. Alice.....	Corvallis	Krueger, E. A.....	Corvallis
Allen, Mrs. L. J.....	Corvallis	Lockwood, John.....	Cloverdale
Bell, Mrs. R. W.....	Corvallis	Lorenzen, Anna.....	Pendleton
Bennett, R. R.....	Gravel Ford	Lorenzen, Leona.....	Pendleton
Bennett, Mrs. R. R.....	Gravel Ford	McMaster, Marion E.....	Corvallis
Bjelland, Lars.....	Parma, Idaho	McMorris, Mabel.....	Condon
Booster, J. Howard.....	Woodburn	MacGregor, Mrs. L. P.....	Dallas
Boothby, Mrs. Lilly M.....	Corvallis	Mayse, Lester.....	Dora
Brennan, John A.....	Coquille	Meyer, Oscar.....	Salem
Brenner, Cleo Forrest.....	Ione	Miller, Alice.....	Corvallis
Breyman, Mrs. A. C.....	Portland	Miller, J. E.....	Corvallis
Briggs, Mrs. A. L.....	Corvallis	Minnard, Willis.....	Heppner
Brown, A. R.....	Centerville, Wash.	Mosby, David C.....	Cottage Grove
Brown, J. R.....	North Bend	Nagel, Viola.....	Gaston
Brumbaugh, Mrs. Nana.....	Corvallis	Nolan, John.....	Ione
Bullis, Mrs. D. E.....	Corvallis	Novalla, Leo.....	The Dalles
Callahan, Emmett.....	Boardman	Nunn, Henry.....	Corvallis
Cannon, Mrs. R. E.....	Corvallis	Olsen, Christian.....	Mt. Angel
Cate, Vernon.....	Tangent	Olsen, Rudolph.....	Oswego
Chapel, Mrs. F. N.....	Portland	Palmer, Beatrice.....	Canada
Chirgwin, H. Stanley.....	Medford	Patten, Harrison I.....	Hillsboro
Chladek, George.....	Lebanon	Patten, John D.....	Corvallis

WINTER SHORT COURSE STUDENTS

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Name	Home Address	Name	Home Address
Clark, Mrs. Maude T.....	Protland	Pelko, A.....	Glenn, Calif.
Clarke, W. W.....	Parkdale	Phelps, Chas. W.....	Corvallis
Clausen, Mrs. F. C.....	Corvallis	Powell, Delma.....	Corvallis
Coon, Mrs. G. B.....	Corvallis	Roberts, Eldon K.....	Independence
Creson, Frank A.....	Hood River	Roberts, Mrs. Lina.....	Corvallis
Deckebach, Frederick.....	Salem	Robinson, Mrs. R. H.....	Salem
Dewell, Mrs. Bernice.....	Corvallis	Rogers, Margaret...San Francisco,	
Dickinson, Arthur L.....	Corvallis		Calif.
Ditsworth, Stewart.....	Derby	Rohoe, Elsie.....	Echo
Donohue, R. J.....	Olympia, Wash.	Schaad, Ruth.....	Newberg
Donohue, Mrs. R. J.....	Olympia, Wash.	Schenck, Robert E.....	Medford
Durflinger, Harry.....	Coburg	Schick, Mrs. A.....	Corvallis
Erickson, Atlee.....	Estacada	Schmidt, Martha.....	Corvallis
Farmer, Hugh G.....	McMinnville	Schubarth, Florette.....	Corvallis
Farra, George R.....	Corvallis	Seymour, Mrs. H. C.....	Corvallis
Glaze, Vena C.....	Corvallis	Shibley, E. W.....	Estacada
Granby, Alva.....	Marshfield	Smith, William W.....	Portland
Grasly, Leonard.....	Langlois	Stinnett, Russell T.....	Ashland
Hall, Willis Edgar.....	Gaston	Stephens, John H.....	Dilley
Hand, Mrs. Maude E.....	Corvallis	Stevenson, A. L.....	Corvallis
Hay, Leila.....	Corvallis	Stevenson, Mrs. A. L.....	Corvallis
Heeszel, Frieda.....	Corvallis	Tarwater, Edward A.....	Corvallis
Hembling, Grace.....	Corvallis	Taylor, Stanley.....	Shelburn
Hereth, C.....	Corvallis	Tinker, Geo. H., Jr.....	Seattle, Wash.
Irwin, Princess.....	Granville, N. D.	Tolleshaug, M. K.....	Rainier
Johnner, Gunner....	Manette, Wash.	Turner, Jasper.....	Gold Beach
Kamholz, H. E.....	Centerville, Wash.	Ulrich, Herman B.....	Airlie
	Wash.	Vana, G. W.....	Crabtree
Kent, W. J.....	Corvallis	Vaughan, Uriah.....	Derby
Kjelland, L. A.....	Valley City, N. D.	Vickers, Mrs. H. A.....	Corvallis
Krause, Gustav.....	Cornelius	Wallis, William E.....	Albany
Krueger, Clara M.....	Corvallis	White, Orval D.....	Monmouth

NOTE.—In addition to the above listed names, out of a total of 1345 students registered in the Farmers' Week and in the special short Resident courses, the names of 1306 students who were registered in these courses but in no other College courses, do not appear.

SENIOR HONOR STUDENTS

Senior honors are conferred by the College Council upon those members of the graduating class who have maintained throughout their entire college course the highest scholastic standing in their department. No student is eligible to this honor unless his general average for all subjects has been eighty-five percent or higher. Election is limited to ten percent of the graduating members of a department.

SELECTION FOR JUNE 1917

AGRICULTURE

Vernon Basler
 Claude Clark Calkins
 Maurice Jernstedt
 Leon Kilby Jones
 Ralph William Lowry
 Alice Moore
 Andrew Edward Murneek

Robert Franklin Throne
 Albrecht Streiff

FORESTRY AND LOGGING
ENGINEERING

Clarence Joseph Budelier
 Carl Charles Jacoby

HOME ECONOMICS

Martha Henrietta Bechen
 Lillian Mildred Imrie
 Grace Kinnison
 Sara Watt Prentiss
 Lois Dorothy Wright

COMMERCE

Winfried Bernard Arens
 Margaret Genevieve Frazier

MINES

Deloss Everett Bullis

ENGINEERING

John Carlyle Boone
 Milton Harris

FORENSIC HONOR ROLL FOR 1916-17

INTERCOLLEGIATE ORATOR

Glen Beagle

INTERCOLLEGIATE DEBATORS

Elvin Winfield McMinds
 William Bernard Mainwaring

Robert Roy Reichart
 Vernon Basler

CHAMPION INTERCLASS ORATOR

Ernest Koch Willer

CHAMPION IN INTERCLASS DEBATE

Theodore Cramer
 Archer Olin Leech

Elvin Winfield McMinds

WINNER OF SHAKOPEAN CUP

Robert Ray Reichart

Awarded annually to the member of the senior class
 having the best record in forensics for
 the whole College course.

CLARA H. WALDO PRIZES

The Clara H. Waldo Prizes are awarded on a basis of both scholarship and general achievement as follows: (a) Proficiency in literary and scholastic attainments; (b) Success in student activities; (c) Qualities of womanhood; (d) Qualities of leadership. The selection is made by a joint arrangement between faculty and students. To the senior woman selected, a prize of forty dollars is awarded; to the junior woman, thirty dollars; to the sophomore woman, twenty dollars; and to the freshman woman, ten dollars. Students receiving second and third place in each class are given Honorable Mention.

SELECTIONS FOR JUNE 1917

SENIORS

Helen MacDonald, Corvallis, Benton
Martha Bechen, Hillsboro, Washington
Grace Kinnison, Charleston, Missouri

JUNIORS

Ruth Kelly, Portland, Multnomah
Katherine Howells, Medford, Jackson
Doris Clark, Portland, Multnomah

SOPHOMORES

Christine Abbott, Roseburg, Douglas
Ruth Kennedy, Corvallis, Benton
Claire Carter, Aberdeen, Washington State

FRESHMEN

Hazel Smith, Hood River, Hood River
Margaret Covell, Corvallis, Benton
Elizabeth Richardson, Portland, Multnomah

SUMMARIES *

CLASSIFIED AS TO COURSE
(All Duplicates Excluded)

Course	Men	Women	Total
Agriculture	419	6	425
Home Economics		413	413
Forestry	53	1	54
Logging Engineering	6		6
Engineering and Industrial Arts.....	247	1	248
Mining	41		41
Chemical Engineering	30		30
Commerce	112	186	298
Pharmacy	44	24	68
Optional	3	24	27
Music	16	42	58
Summer School	96	268	364
Apple Packers' Course.....	2	8	10
Pruning Course	23		23
Farmers' Week	838	401	1239
Winter Short Courses	64	43	107
Radio and Buzzer.....	42		42
Totals	2036	1417	3453**

* The enrollment statistics include only those who have pursued work at the College; correspondence students are omitted.
** Total to and including May 15, 1918.

CLASSIFIED AS TO RESIDENCE
(All Duplicates Excluded)

States and Territories:		Ohio		12
Oregon	2896	Oklahoma		3
Alaska	1	Pennsylvania		6
Arizona	1	Philippine Islands		3
California	188	South Dakota		5
Colorado	6	Texas		1
District of Columbia.....	3	Utah		2
Hawaii	2	Vermont		1
Idaho	56	Washington	148	
Illinois	9	Wisconsin	4	
Indiana	7	Wyoming	2	527
Iowa	4			
Kansas	8	Foreign Countries:		
Massachusetts	1	Canada	15	
Michigan	6	China	5	
Minnesota	4	India	4	
Missouri	2	Ireland	1	
Montana	17	Scotland	1	
Nebraska	5	South America.....	1	
Nevada	2	Sweden	2	
New Hampshire	2	Turkey	1	30
New York	6			
North Carolina	1			
North Dakota	9	Net total		3453

COMPARATIVE ENROLLMENT

1888-1889	97	1903-1904	530
1889-1890	151	1904-1905	680
1890-1891	201	1905-1906	735
1891-1892	208	1906-1907	833
1892-1893	282	1907-1908	1156
1893-1894	240	1908-1909	1352
1894-1895	261	1909-1910	1591
1895-1896	397	1910-1911	1778
1896-1897	316	1911-1912	2868
1897-1898	336	1912-1913	2314
1898-1899	388	1913-1914	2435
1899-1900	405	1914-1915	4176
1900-1901	436	1915-1916*	3251
1901-1902	448	1916-1917†	3797
1902-1903	541	1917-1918§	3453

The great difference in the total enrollment for the two years, 1910-11 and 1911-12, was due largely to the increase in the number of students registered for the winter short courses in Agriculture. The increase in the number of regular students in the 36-weeks courses was 24 percent.

The decrease in the number of students in 1912-13 from the year 1911-12 is due to the decrease in the short course registration. The increase in the number of regular students in the 36-weeks courses was 19 percent.

* Totals to and including March 16, 1916.

† Totals to and including April 25, 1917.

§ Totals to and including April 8, 1918.

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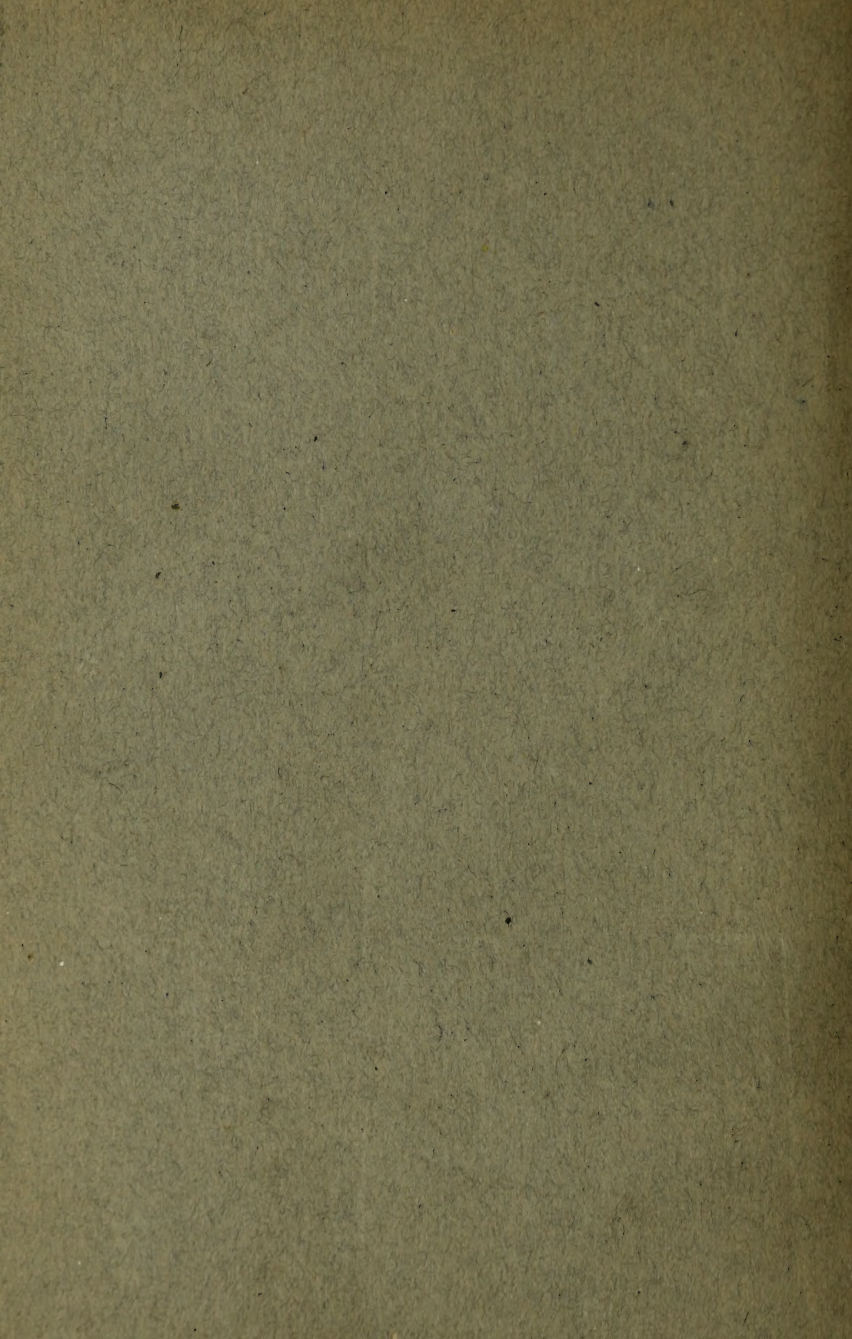
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